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**GANDHINAGAR**

**Ph.D. Course Work**  
**in**  
**BIOTECHNOLOGY**

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**KADI SARVA VISHWAVIDYALAYA**  
**GANDHINAGAR**

**Ph.D. Course work for  
Biotechnology  
2009-10**

**Course structure**

Paper	Title	University Examination (marks)		Duration of exam	Schedule of exam
		Section A (general)	Section B (specialization)		
Paper-I	Research methodology	60	40	2 hrs	Every six months
Paper-II	Scientific communication	60	40	2 hrs	
Paper-III	(Recent Trends in Biotechnology)	100		2 hrs	

**Paper-I Research Methodology**

**Syllabus**

**SECTION-A ( Common to all faculty)**

**60 marks**

- 1) Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research 2
- 2) Defining the Research Problem : What is Research Problem?, Selecting the Problem, Necessity of and Techniques in defining the problem 3

- 3) Research Design: Meaning, Need, Features of Good Design, Concepts, Types. Basic Principles of Experimental Design, Developing a Research Plan 3
- 4) Sample Design : Implication, Steps. Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design. 4
- 5) Measurement and Scaling Techniques: Measurement in Research, Measurement Scales, Sources of Errors in measurement, Tests of Second measurement, Technique of developing Measurement Tools, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques. 6
- 6) Methods of Data Collection: Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of appropriate method for data collection, Case Study Method, Guidelines for developing questionnaire, successful interviewing. Survey v/s experiment. 6
- 7) Processing and Analysis of Data : Processing Operations (Meaning, Problems), Data Analysis (Elements), Statistics in Research, Measures of Central Tendency, Dispersion, Asymmetry, Relationship. Regression Analysis, Multiple correlation and Regression, Partial Correlation, Association in case of Attributes 6
- 8) Sampling Fundamentals : Definition, Need, Important sampling Distribution, Central limit theorem Sampling Theory, Sandler's A-test, Concept of Standard Error, Estimation, Estimating population mean, proportion. Sample size and its determination, Determination of sample size Based on i) Precision Rate and Confidence level ii) Bayesian Statistics. 7
- 9) Testing of Hypothesis: Meaning, Basic concepts, Flow diagram, Power of a hypothesis test, Important parametric tests, Hypothesis Testing of Means, Differences between Means, Comparing Two related samples, Testing of Proportion, Difference between proportions, Comparing variance to hypothesized population variance, Equality of variances of two normal populations, hypothesis testing of Correlation coefficients, Limitations of Tests of hypothesis. 7
- 10) Chi- square test : Applications, Steps, characteristics, limitations 2
- 11) Analysis of Variance and Covariance : Basic Principles, techniques, applications, Assumptions, limitations. 6

- 12) Analysis of Non-parametric or distribution-free Tests : Sign Test, Fisher-Irwin Test, McNemer Test, Wilcoxon Matched pair Test (Signed Rank Test), Rank 4
- 13) Sum Tests : a) Wilcoxon-Mann-Whitney Test b)Kruskal-Wallis Test, One sample Runs Test, Spearman's Rank Correlation, Kendall's Coefficient of Concordance, Multivariate Analysis Techniques: Characteristics, Application, Classification, Variables, Techniques, Factor Analysis (Methods, Rotation), Path Analysis. 4

## **SECTION-B (For Faculty of Biotechnology)**

**40 marks**

### **1. Biotechnology Products & Processes:**

Biotechnology Experimental Design: Factorial Designs, Fractional Factorial Designs, Rechtschaffner designs, D-optimal designs, Response surface methodology, Process optimization and validation, Sample size determinations, Controlling variability, Analyzing and minimizing variations in Biotechnology procedures, Statistical experimental designs for cultivation & fermentations, optimizing Fermentations, multivariate analysis of chemical and biological data. 20

### **2. Quality assurance:**

Development, validation, optimization of analytical methods for metabolites based on HPLC, spectrophotometry, chromatography and Bioassay etc., Quality assurance in Biotechnology Industries and, Contract Research Organizations etc. 10

### **3. Phytopharmaceuticals and Animal Cell based products:**

Experimental Design in preparing and optimizing herbal extracts, testing herbs / herbal material from Bioactive materials. 10

Reference Books: Latest Editions of following Books

- 1) Kothari, C.R., Research Methodology (Methods and Techniques), New Age Publisher
- 2) Fundamentals of modern statistical methods By *Rand R. Wilcox*
- 3) Power Analysis for Experimental Research A Practical Guide for the Biological, Medical and Social Sciences by *R. Barker Bausell, Yu-Fang Li* Cambridge University Press
- 4) Design of Experiments: Statistical Principles of Research Design and Analysis, by *Robert O. Kuehl* Brooks/Cole

**Research Methodology**  
**Model Question Paper**

- Instructions: 1) Section-I is of 60 marks  
2) Section-II is of 40 marks  
3) There is no negative marking for incorrect answers

**SECTION-A**

Q1. Multiple Choice Questions: Choose one most correct answer from the provided choices. Write your choice on the right hand side column only. Illegibly written answers will not be considered. Each Question carries two marks. **(2x10 marks)**

- i) Why is a control necessary in a well planned experiment?
- a) To show what would normally happen and compare it with what happens when you change the independent variable.
  - b) To keep the experiment from becoming chaotic.
  - c) So that the experiment can be contained.
  - d) For graphing purposes only
- ii) Consider the following data:  
14; 16; 16; • 22; 25; 38; 38; 38; 38; 2000  
Which of the measures of central tendency would be the least useful?
- a) mean
  - b) mode
  - c) median
- iii) As the degrees of freedom increase (and especially when the degrees of freedom are more than 90), the graph of the chi-square distribution looks more and more \_\_\_\_\_.
- a) symmetrical
  - b) skewed right
  - c) skewed left
  - d) asymmetrical
- iv) The Goodness-of-Fit hypothesis test is typically a \_\_\_\_\_.
- a) two-tailed test
  - b) wagging-tailed test
  - c) left-tailed test
  - d) right-tailed test

- v) Determine the sampling technique: A medical researcher does a random survey of 100 female doctors and 100 male doctors.
- stratified
  - systematic
  - simple random
  - cluster
  -
- vi) Following is not the example of tests.
- Chi test
  - t-test
  - pie test
  - F-test
- vii) Following is not the part of basic principles of experimental designs
- Replication
  - Randomization
  - Local Control
  - Reduction
- viii) Following is the type of informal experimental designs.
- Before-and after with control design
  - Completely randomized Design
  - Latin square Design
  - Factorial Designs
- ix) For data that is normally distributed, is it possible for the standard deviation to be larger than the mean?
- No.
  - Yes.
  - There is not enough information to determine.
- x) What is the difference between the independent and dependent variables in an experiment?
- The independent variable is quantitative and the dependent variable is not.
  - The independent variable is what is changed and the dependent variable is what is measured.
  - The independent variable has disowned his parents and the dependent variable still relies on them for food, shelter, and gas money.
  - The independent variable is graphed on the y-axis and the dependent is graphed on the x-axis.

Q2. Fill in the Blanks:

**(2 x 10 marks)**

- i) ----- refers to a design that has more than one independent variable.

- ii) ----- is an external variable that affects the internal variable and intertwines with other extraneous variables such that it is difficult to determine unique effects of each.
- iii) ----- is the non-manipulated variable in factorial design.
- iv) ----- is an arbitrary value, designated as the significance level.
- v) ----- is the measure of the flat-toppedness of a distribution curve
- vi) ----- factorial designs consider the effect of varying two factors on the dependent variable.
- vii) ----- technique is used design or plan the experiment in such a way that the variations caused by extraneous factors can all be combined under the general heading of “chance”.
- viii) ----- measures seperstely the relationship between two variables in such a way that the effects of other related variables are eliminated.
- ix) ----- defines the limits within which the parameters of the population are expected to lie with a specified degree of confidence.
- x) When there really is a difference (association, correlation) overall, but random sampling caused your data to not show a statistically significant difference, the errors responsible for this are called \_\_\_\_\_

Q3. Answer true or false for the following statements: A correlation coefficient: **(4 marks)**

- a. Should not be calculated when there is an underlying relationship between the two variables but it is not linear.
- b. Does not provide evidence of a causal relationship between two variables.
- c. Should not be used to judge the biological importance of the relationship between two variables.
- d. Should be performed only when certain assumptions are satisfied (e.g. variables measured on a random sample of individuals, both the variables are quantitative and at least one of the two variables need to be normally distributed).

Q4. Answer true or false for the following statements: The paired t-test: **(5 marks)**

- a. Tests the null hypothesis that the two population means are equal
- b. Must have equally sized numbers of observations in each group.
- c. Assumes that the data in each group are normally distributed.
- d. Is appropriate for comparing the means of independent groups of observations.
- e. When appropriately used, is more powerful when the sample size is large.

Q5. Answer true or false for the following statements **(5 marks)**

- a. The p-value is the probability of the sample data arising by chance.
- b. The p-value is an arbitrary value, designated as the significance level.
- c. The p-value is the chance of getting an observed effect if the null hypothesis was false.
- d. The p-value is the chance of getting an observed effect if the null hypothesis was true.
- e. A very small p-value allows us to say that there is enough evidence to accept the null hypothesis.

Q6. Match the following : **(5 marks)**

**Example**

- i) Effect of digital BP instruments accuracy.
- ii) CVS Research in Institute during 1990-1995
- iii) Effect of temp on productivity
- iv) Effect of fertilizer X on plant cultivation
- v) Relationship of using mobile and brain tumor.

**Research Design**

- a) Exploratory Research studies.
- b) Descriptive and Diagnostic Res. Studies.
- c) Hypothesis Testing Research studies.
- Hypothesis Testing Research studies
- Hypothesis Testing Research studies

Q7. Write the below functions in sequence. (e.g. d-a-c-b-f-e) **(1 mark)**

- a) Selection of samples. b) Analysis of data c) Designing the methods of data collection.
- d) Formulating the objective of study e) Report preparation f) Collection data

**SECTION-B**

**(Max. Marks -40)**

**Design an experiment for any one of the under mentioned research topic:**

- I) To prove that dissolved oxygen promotes biosynthesis of antibiotics.
- II) To prove that bioassay method of Penicillin is more accurate, precise and reproducible than determination by titration method.
- III) To optimize fermentation conditions for production of Alcohol by yeasts and to evaluate the impact of pH, temperature and humidity on Alcohol yields.
- IV) You are given three herbal drug extracts which are reported to possess anti-bacterial activity. Design an experiment to find out the optimum proportion of each of the extracts to be combined to achieve maximum therapeutic efficacy.
- V) To prove that different plant organs show different responses to IBA, GA & and NAA

Note : The design should describe following :

- a) Type of design (e.g. Cross-over, 2 x 2 factorial etc.) **3 marks**
- b) Sample size **2 marks**



- |   |          |
|---|----------|
| c) Design table/ Flow chart                                       | 15 marks |
| d) Parameters to be studied                                       | 3 marks  |
| e) Sample Selection method  | 5 marks  |
| f) Statistical Analysis to be involved in the study and the basis | 12 marks |

## **Paper-II                      Scientific Communication**

### **SECTION-A (Common for all faculty)**

**60 marks**

#### **Syllabus**

1. Basics of Communication skill.
  - a) English Grammar: Word Choice, Sentence Structure, paragraph structure, **Comprehension**
2. Types of Scientific Communications.
3. Importance of publishing research papers
4. Publishing Research paper :
  - a) Preliminaries, Format, Choosing Journal
  - b) Title, Running Title
  - c) Authors: Single and Multi authorship
  - d) Writing Abstract
  - e) Introduction section
  - f) Materials and Methods Section
  - g) Result Section
  - h) Figures : Design Principles, Legends, Table components, Graphs: Types, Style, Tables v/s Graph
  - i) Discussion Section: Format, Grammar Style, Content.
  - j) Acknowledgements
  - k) References : Different Styles
  - l) Selecting Keywords
  - m) Communication with the Editor, Handling Referees' Comments, Galey Proofs
5. Writing Review Articles
6. Preparing and Delivering of Oral **and Poster** Presentations
7. Avoiding Plagiarism
8. Preparing documents for MoUs, Confidentiality Agreements.
9. IUPAC symbols and Terminology for physicochemical quantities and Units, SI prefixes, Fundamental Constants, Standard Abbreviations and Symbols

## SECTION-B

40 marks

### Biotechnology:

1. Exercises on writing Biotechnology related research papers, preparing project proposals for funding agencies and preparing a power point presentations 20
2. Assignment on Critical analysis of research papers of interest published in refereed journals with respect to language, content, title, reference style, data, figures, tables, Discussion etc. and preparing a report on the same. 10
3. Assignment on Writing and submitting a review article related to doctoral research topic for an international journal. 10

### Reference Books:

- 1) Study and Communication Skills for the Biosciences by *Stuart Johnson and Jon Scott*, Oxford University Press
- 2) Write and Publish a Scientific Paper by *Robert A. Day* Oryx Press
- 3) Scientific Easy when you know how by *Jennifer Peat* BMJ Books
- 4) Research Projects and Research Proposals A Guide for Scientists Seeking Funding by *Paul G. Chapin* Cambridge University Press

### Model Question Paper for Paper-II (Scientific Writing)

#### SECTION-A

- 1) Which of the following is the most correct title for the provided abstract? (4 marks)
  - a) Anti-staphylococcal activity and mode of action of clofazimine
  - b) Bactericidal property of Clofazimine
  - c) Cofazimine is effective against S.aureus

#### ABSTRACT

**Objectives:** Infections caused by *Staphylococcus aureus* might be treated with agents whose primary indications are for other infections. Clofazimine, an established anti-mycobacterial drug, could be such a candidate. However, the anti-staphylococcal properties of clofazimine have not been fully described and its mode of action, possibly involving inhibition of both RNA polymerase and a membrane-located target, has not been explored in detail. We have now conducted experiments to address these issues. **Methods:** Using established procedures, we examined the

activity of clofazimine against a range of clinical isolates of *S. aureus* and determined whether it was bactericidal, exhibited a post-antibiotic effect (PAE), or interacted synergically with other agents. The potential for emergence of clofazimine-resistant mutants was also examined. Mode of action studies involved macromolecular synthesis assays, cross-screening against rifampicin-resistant mutants, susceptibility of RNA polymerase to clofazimine in vitro and several methods to detect drug-induced membrane damage. Results: Clofazimine demonstrated good anti-staphylococcal activity encompassing MSSA, MRSA and GISA. It was bactericidal and resistant mutants could not be isolated. Clofazimine did not exhibit a PAE and failed to act synergically with other drugs. No evidence for specific inhibition of RNA polymerase was obtained. Clofazimine caused non-specific inhibition of DNA, RNA and protein synthesis, consistent with membrane-damaging activity that was detected in three independent assays for membrane disrupting agents. Conclusions: Clofazimine is a potent anti-staphylococcal agent. It appears to be a membrane-disrupting agent and does not inhibit RNA polymerase.

- 2) Choose the correct word from the given choices to replace the underlined word/fill in the blank in the given sentences- (5 x 2 marks)
- a) Oral pediatric formulations of artemether are urgently needed, however the tablets are difficult to administer to young children, who cannot swallow whole tablets or tolerate the bitter taste of the crushed tablets.
- Because
  - As
  - Since
  - however
- b) I \_\_\_\_\_ several eminent scholars in my study of herbal drug resources.”
- Cited
  - Sited
- c) The differences between the control and experimental groups were \_\_\_\_\_
- Insignificant
  - Nonsignificant
- d) Noradrenaline \_\_\_\_\_ contractile response on rat vas deferens
- elicit
  - illicit
- e) Resistance to antibiotics is becoming \_\_\_\_\_ difficult problem in the management of bacterial infections.
- An Increasingly
  - More

iii) Highly

Q 3. Answer in Short:

- a) Give full form of IUPAC (2)
- b) Enumerate three most commonly followed styles of referencing (3)
- c) What is Running title? (2)
- d) Differentiate between histogram and bar chart (2)
- e) Define Plagiarism (2)
- f) Enumerate components of a tabular representation of result data (2)
- g) Give the standard abbreviations of : (3)
  - i) mililiter
  - ii) hour
  - iii) minutes
- e) Differentiate between research paper and review article (3)
- f) Define “ Rapid Communication” (2)
- g) Differentiate Symposium, panel Discussion and Seminar (3)

Q4. True or False (If false provide the correct answer) (2 x 6)

- I) Passive voice is the most suitable sentence arrangement for scientific communication
- II) Discussion section of a research paper discusses only the results obtained in the study
- III) The first author is always the one who is the research guide and last author is one who is major contributor in experimental work.
- IV) The numbers mentioned in the result table can have any number of decimal points.
- V) Introduction section consists of summary of literature survey conducted prior to the study.
- VI) The tense used in result section is mostly present tense.

### SECTION-B

Q1. Provide the following for the given paper:

- a) Correct Title ( not more than 50 letters) (5)
- b) Most suitable Keywords (2)
- c) Abstract ( not more than 250 words) (10)
- d) Headings, footnotes and Legends to figures and tables (5)

Q2. Describe the result section using the provided tables and charts. (8)

Q3. Write a paragraph (not more than 100 words) on “Current Status of Biotechnology Industries in Gujarat”.

Note : You should put stress on method of writing, grammar, flow of thoughts, conclusion. Accurate data are not required. (10)

### **Paper-III Recent trends in Biotechnology**

**100 Marks**

Introduction and Applications of following:

- a. Enzymes for industry/ Medicine, Immobilized enzyme technology, designer enzymes – Biosensors
- b. Molecular Farming, Edible Vaccines, Therapeutics from Transgenic Plants, Bio-Degradable Plastics, Molecular Markers, RAPD, RFLP, AFLP Techniques,
- c. Plant Cell culture and production of Secondary metabolites
- d. Animal cell culture Techniques, Gene Therapy, Stem Cells in Therapeutics, Oncogenes, Tumor suppressor Genes & Cancer Biology, AIDS & other Immuno- deficiencies
- e. Characterization and production of Recombinant Therapeutic proteins, Bioinformatics & Computer aided Drug Designing
- f. Biopesticides in integrated pest management
- g. Bioremediation of contaminated soils and waste land. Waste Management strategies
- h. Bio-Energy, Bio-Diesel: Tree borne and Algal oils and Trans-esterification, Hydrogen and Electricity from Microbes
- i. Biosafety in relation to recombinant organisms & transgenic research applications, Social and ethical issues.
- j. Process Economics, Cost Analysis and Investment Decisions

References:

1. Basic Biotechnology ---Colin Ratlidge and Bjorn Kristiansen, Cambridge University Press, 2006
2. Biotechnology and Biopharmaceuticals ---- Rodney J.Y. Ho and Milo Gibaldi, Wiley-Liss 2003
3. Culture of Animal Cells --- Ian Freshney Wiley-Liss 2006
4. Microbial Biotechnology ---- Alexander N Glazer and Hiroshi Nikaido, Cambridge University Press, 2006

**Model Question paper for PhD Coursework:**

**Paper-III Recent Trends in Biotechnology**

Q1. Multiple Choice questions:

**(20 x 10 mark)**

- 1) Trans- esterification of lipids is catalysed by
  - a) NaOH
  - b) Methanol
  - c) Microbial Lipases
- 2) Which of the following is essential for animal cell culture medium
  - a) Serum
  - b) Sodium chloride
  - c) Phosphates
- 3) Which of the following route of administration is best for Biopharmaceuticals?
  - a) Oral
  - b) Intramuscular
  - c) Intravenous
  - d) Intra-peritoneal
- 4) Growth rate in a bioreactor can vary due to :
  - a) Age of inoculum
  - b) Inoculum to fermentation volume ratio
  - c) Agitator speed
  - d) All of the above
- 5) Which of the following regulate the biosynthesis of microbial secondary metabolites
  - a) Carbon catabolite
  - b) Phosphate
  - c) Nitrogen
  - d) End product.
- 6) What type of molecules are Insulin, EPO, TPA & hGH
  - a) Proteins
  - b) Lipids
  - c) Glycosides
  - d) Glycoproteins
- 7) Which of the following is NOT a laboratory safety rule?
  - a) You should never mix acids with bases
  - b) You should tie back your long hair
  - c) You should never add water to acid
  - d) All of the above are valid safety rules

- 8) Stem Cells can be obtained from
- a) Bone Marrow
  - b) Umbellical Chord
  - c) Both these
- 11) What piece of laboratory equipment is best-suited for accurately measuring the volume of a liquid?
- a) Graduated cylinder
  - b) Graduated beaker
  - c) Erlenmeyer flask
  - d) Volumetric Flask
- 12) Which method is best for preservation of microbial cultures?
- a) Sand culture
  - b) Lyophilization
  - c) Dried culture on grains
  - d) Agar culture covered by sterile liquid Paraffin
- 13) Anoxic degradation of organic matter takes place in
- a) Rotating Biological contacters
  - b) Activated sludge processionisation, acceleration, deflection, detection
  - c) Anaerobic Digester
  - d) Middle of an agitated tank
14. Which one of the following statements is incorrect?
- a) *Escherichia coli* is obligate aerobe
  - b) *Escherichia coli* is obligate anaerobe
  - c) *Escherichia coli* is facultative anaerobe
- 15) Which one of the following gases is supposed to be responsible for Global warming
- a) CO<sub>2</sub>
  - b) Methane
  - c) Ozone
  - d) All of them
- 16) Which one of the following pieces of information cannot be obtained from a computer controlled bioreactor?

- a)  $DO_2$
  - b) Substrate concentration
  - c) Molecular mass of end product
  - d) Rate of Biosynthesis of the end metabolite
- 17) Activation Energy of a bioprocess can be reduced by
- a) Catalyst
  - b) Environmental conditions
  - c) Substrates concentration
  - d) End product concentration
  - e) All of them
- 18) Which of the following is not a biopesticide
- a) *Trichoderma*
  - b) *Stienernema*
  - c) Azadirachtin
  - d) BT
  - e) All of them
- 19) Enzymes present in Detergents can be
- a) Lipases
  - b) Lipase & Protease
  - c) Lipase & Amylase
  - d) None of these
- 20) An endocrinal glycoprotein that stimulates the production of red blood cells by stem cells in bone marrow is:
- a). GM-CSF
  - b). CSF
  - c). GM-CSF
  - d). EPO

**Q2. Fill in the Blanks:**

**(20 x 1 mark )**

- 1) Pharmacopoeia does not describe the -----process of a drug.
- 2) Quality of biodiesel gets affected by the----- composition of the lipid.
- 3) A fungus commonly used as wide spectrum insecticide is-----



- 4) A widely used substrate for single cell protein manufacture is -----
- 5) p53 is a tumor-----gene
- 6) HPLC technique gives higher resolution than TLC techniques because of \_\_\_\_\_
- 7) Gas chromatography is not suitable for analysis of \_\_\_\_\_ type of compounds.
- 8) To work out the molecular mass of a secondary metabolite you would look at its \_\_\_\_\_ spectra.
- 9) For antiseptic effect minimum \_\_\_\_ % alcohol can be used.
- 10) Distilled water is free from\_\_\_\_\_ .
- 11) Clinical trials of a biopharmaceutical establish the efficacy and ----- of the molecule
- 12) One of the growth Hormone used in Plant Tissue culture to induce root formation is -----
- 13) The enzymes that converts *Bacillus thuringiensis var. kurstaki* parasporal crystal in to insecticidal toxin is-----
- 14) A biopharmaceutical manufactured through immobilized cells is -----
- 15) Humulin is used for treatment of ----- in human beings
- 16) New generation refrigerants contain----- rather than -----
- 17) \_\_\_\_\_ tissue forms new cells in plants
- 18) Chlorophyceae algal species synthesizing Hydrocarbons is -----
- 19) Gene associated with insecticidal activity of *Bacillus thuringiensis* against Coleopteran insects is -----
- 20) Blue green Alga commonly used as Biofertilizer is -----

**Q3. True/False (correct the false statement)**

**(20 x 1 mark)**

- 1) In Phase-IV Clinical Trials premarketing surveillance is conducted
- 2) LAL test for pyrogen testing is conducted on mice
- 3) Toxicity testing are normally done in Guinea pigs
- 4) Ministry of Environment is the highest authority for grant of permission to recombinant crops in India.
- 5) All experiments on efficacy of new phytopharmaceuticals on human beings require permission of Ethics Committee.
- 6) Every country has it's own Pharmacopoeia.
- 7) Control groups are not required for anti-inflammatory study.
- 8) All enzymes are thermolabile.
- 9) Patent Act in INDIA is applicable.
- 10) 95% alcohol (Ethanol) means rectified spirit.
- 11) Ampicillin is a generic drug.
- 12) Transgenic B.T. can be sourced from animals.
- 13) "Water for injection" is corrosive.

- 14) Herbal drugs do not have side effects.
- 15) MTT assay is used for detecting cytotoxicity
- 16) Microbial products can be used as artificial skin for human beings.
- 17) RNase is the enzyme not destroyed by thermal shock at 64<sup>0</sup> C
- 18) GRAS microbes are at times dangerous.
- 19) *Sulfolobus acidocaldarius* is a polyextremophile used in Bioleaching
- 20) Integrity of HEPA filter is validated by smoke leak test

**Q4. Match the Following:**

**(4 marks X 5)**

A)

<u>Instrument</u>	<u>Principle</u>
1. Rotary Shaker	a) Sedimentation at high velocity
2. Refrigerated Centrifuge	b) Bioreactor with photoperiods
3. Photobioreactor	c) Wet heat
4. Autoclave	d) Agitation for mass transfer

B)

1) Lipids	a) PCR
2) Separation of Phytoconstituents	b) GC
3) Gene Ammplification	c) Soxhlet Apparatus
4) Chromatography of volatiles	d) HPTLC technique

C)

1) Spectrophotometer	a) Algal cultivation
2) LAL Test	b) Tree borne oils
3) Photobioreactor	c) Pyrogen Testing
4) Soxhlet assembly	d) Membrane Filter
5) Sterility Testing	e) Microbial growth

D)

1) Cheese	a) Gluten
2) Biodegradable plastics	b) Rennets
3) Flavour in Bread	c) Curd
4) Beer Flavour	d) Amino acids

E)

- |                         |                         |
|-------------------------|-------------------------|
| 1) Blood clot           | a) PCR                  |
| 2) Anti Cancer Alkaloid | b) Alkaline Phosphatase |
| 3) Gene Ammplification  | c) Plasmin              |
| 4) Milk Sterility       | d) Vincristin           |

Q. 5. Write Short Notes on any two (10 marks X 2)

- a. Proteases and their uses
- b. Microbial Enzymes as medicines
- c. Quality assurance checks obligatory in fermentation
- d. Proliferation and differentiation in animal cell culture
- e. Perfusion monolayer culture
- f. aerobic treatment of waste water.
- g. Biodegradable Plastics
- h. International Conference on Harmonization, somatic embryogenesis
- i. Molecular Markers, RAPD, RFLP, AFLP Techniques
- j. –Biosensors
- k. Stem Cells in Therapeutics, Oncogenes,
- l. Tumor suppressor Genes & Cancer Biology, AIDS & other Immuno- deficiencies
- m. Biopesticides in integrated pest management
- n. Hydrogen and Electricity from Microbes
- o. Biosafety in Biotechnology.
- p. Biotechnology Investment Decisions based on Process Cost Analysis

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# Computer Science and Computer Engineering

## Introduction:

The course work for the doctoral research has been made mandatory by the UGC. Kadi Sarva VishwaVidyalaya has decided to implement this aspect on the immediate basis for the benefit of the students pursuing Ph.D. The course work is designed in such a way as to support, motivate and encourage quality research. By undergoing this course work, the student will get equipped with fundamentals of research methodology, scientific communication and also recent developments in the field of specialization. The course work has to be completed by the student in a satisfactory way before submission of his/her dissertation thesis.

## Course Structure:

Paper	Title	University Examination		Total Marks
		Section A	Section B	
Paper-I	Research Methodology	60	40	100
Paper-II	Scientific Communication	60	40	100
Paper-III	Specialization Paper	60	40	100



# Paper-I Research Methodology

## Section-A ( Common to all faculty)

- 1) Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research 3
- 2) Defining the Research Problem : What is Research Problem?, Selecting the Problem, Necessity of and Techniques in defining the problem 6
- 3) Research Design: Meaning, Need, Features of Good Design, Concepts, Types. Basic Principles of Experimental Design, Developing a Research Plan 6
- 4) Sample Design: Implication, Steps. Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design. 7
- 5) Measurement and Scaling Techniques: Measurement in Research, Measurement Scales, Sources of Errors in measurement, Tests of Second measurement, Technique of developing Measurement Tools, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques. 10
- 6) Methods of Data Collection: Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of appropriate method for data collection, Case Study Method, Guidelines for developing questionnaire, successful interviewing. Survey v/s experiment. 10
- 7) Processing and analysis of Data : Processing Operations (Meaning, Problems), Data Analysis (Elements), Statistics in Research, Measures of Central Tendency, Dispersion, Asymmetry, Relationship. Regression Analysis, Multiple correlation and Regression, Partial Correlation, Association in case of Attributes 10
- 8) Sampling Fundamentals : Definition, Need, Important sampling Distribution, Central limit theorem Sampling Theory, Sandler's A-test, Concept of Standard Error, Estimation, Estimating population mean, proportion. Sample size and its determination, Determination of sample size Based on i) Precision Rate and Confidence level ii) Bayesian Statistics. 12
- 9) Testing of Hypothesis: Meaning, Basic concepts, Flow diagram, Power of a hypothesis test, Important parametric tests, Hypothesis Testing of Means, Differences between Means, Comparing Two related samples, Testing of Proportion, Difference between proportions, Comparing variance to hypothesized population variance, Equality of variances of two normal populations, hypothesis testing of Correlation coefficients, Limitations of Tests of hypothesis. 12
- 10) Chi- square test : Applications, Steps, characteristics, limitations 3
- 11) Analysis of Variance and Covariance : Basic Principles, techniques, applications, Assumptions, limitations. 7
- 12) Analysis of Non-parametric or distribution-free Tests : Sign Test, Fisher-Irwin Test, McNemer Test, Wilcoxon Matched pair Test (Signed Rank Test), Rank 7
- 13) Sum Tests : a) Wilcoxon-Mann-Whitney Test b)Kruskal-Wallis Test, One sample Runs Test, Spearman's Rank Correlation, Kendall's Coefficient of Concordance, Multivariate Analysis Techniques: Characteristics, Application, Classification, Variables, Techniques, Factor Analysis (Methods, Rotation), Path Analysis. 7

Reference Books: Latest Editions of following Books

- 1) Kothari, C.R., Research Methodology (Methods and Techniques), New Age Publisher
- 2) Fundamentals of modern statistical methods By *Rand R. Wilcox*
- 3) Power Analysis for Experimental Research A Practical Guide for the Biological, Medical and Social Sciences by *R. Barker Bausell, Yu-Fang Li* Cambridge University Press
- 4) Design of Experiments: Statistical Principles of Research Design and Analysis, by *Robert O. Kuehl* Brooks/Cole

## **Section-B (Faculty of Computer Sciences)**

### **Research Areas:**

Databases, Distributed Databases, Data warehouse, Data Mining, Operating Systems, Network Technologies, Processor Technologies, Mobile Computing, Software Engineering, Web Technologies, Virtual environments and Services, Wireless Networks, and related areas.

### **Exercise-1**

- Select the area of research.
- Define a problem.
- Outline the Title
- Survey of Literature and its documentation
- Formulation of Research hypothesis with expected outcomes
- Research Plan
- Requirements Engineering
- Research Design : Model, Architecture, Prototyping
- Implementation of Prototype and data collection
- Data Analysis: Use of Software Tools like MATLAB, SPSS, etc.
- Testing
- Evaluation
- Future scope of research

**Evaluation:** [Based on university examination, 100 marks paper of 3hrs]

Section A will be having a weightage of 60 marks. Questions will be of objective types.

Section-B marks will be having a weightage of 40 marks. Answers to any question should not exceed more than five lines.

**Kadi Sarva Vishwavidyalay**  
**Ph. D Course Work**  
**Paper-I Research Methodology**

**Duration 3 hrs.**

**Total Marks: 100**

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**Section A**

**Que 1: Answer the following objective questions**

**Marks[20]**

1. The research question "What is the meaning of the lived experience?" is used in:  
A. Ethnography  
B. Phenomenology
2. Data collection for phenomenological research is done through:  
A. Questionnaires  
B. Interviews and observation methods
3. A process whereby data are analyzed by comparing data with other data as they are acquired during research is called constant comparative analysis. This method is used in:  
A. Grounded theory research  
B. Historical research
4. The qualitative approach that considers an idea or issue from all perspectives through an extensive exploration of the literature is called:  
A. Philosophical inquiry  
B. Quantitative analysis
5. The approach of understanding the 'natives' view of their world as an outsider is called:  
A. Emic  
B. Etic
6. Parse and Watson used what type of method for their qualitative analysis?  
A. Ethnography  
B. Phenomenology
7. The outcome of grounded theory method is to arrive at theory.  
A. True  
B. False
8. Which research method compiles data and facts regarding people, events and occurrences of the past?  
A. Historical  
B. Ethnographic
9. People who have special knowledge about a culture and are willing to share with an ethnographer are called:  
A. Informants  
B. Participant/observers
10. The process of identifying meaning of human experiences through intensive discussion with persons who are living the experience is called:  
A. Case study research  
B. Phenomenological research



11. Phenomenological research may investigation "being in time."  
A. True  
B. False
  12. Quantitative research uses  
A. Inductive reasoning  
B. Deductive reasoning
  13. Qualitative research uses  
A. Inductive reasoning  
B. Deductive reasoning
  14. A typical number of participants in a qualitative study is:  
A. Large  
B. Small
  15. Which method of research focuses on descriptions of cultural groups?  
A. Ethnography  
B. Case study
  16. An investigation of a phenomenon by a few participants to discover meaning is called:  
A. Phenomenology  
B. Philosophical Inquiry
  17. Phenomenology has its philosophical basis in:  
A. Science  
B. Philosophy
  18. Ethnography has its foundation in:  
A. History  
B. Anthropology
  19. Grounded theory has its base in:  
A. Symbolic Interaction theory  
B. Heideggarian theory
20. List three research areas where you can apply qualitative research.

**Que 2: Answer the following True/False**

**Marks[20]**

1. Simple random sampling is also known as chance sampling. T/F
2. Purposive sampling is not known as non probability sampling. T/F
3. The most practical way of systematic sampling is to select every n<sup>th</sup> name. T/F
4. Multistage sampling may lead to cluster sampling. T/F
5. Research is much concerned with proper fact finding analysis and evaluation with conclusion. T/F
6. Defining a research problem properly and clearly is a crucial part involving a set of steps. T/F
7. Reframing the research problem is reshaping in the working proposition. T/F
8. Factorial design is classified under formal experimental design. T/F
9. All quantitative data is based upon qualitative judgments; and all qualitative data can be described and manipulated numerically/F
10. Z-test is a parametric test. T/S.
11. F-Test is non-parametric test. T/F.
12. Differential scale is associated with Thrust one type scale. T/F
13. Tabulation is an essential in the research study. T/F.

14. Mean is position based average, while median is value based average. T/F
15. Mode is least occurring value in the series. T/F.
16. Harmonic mean is reciprocal of the average of reciprocals of values. T/F.
17. Standard deviation is a measure expressed as square root of average of square of reciprocal values. T/F.
18. Cross tabulation approach is not useful when data is in normal form. T/F
19. Sampling theory can be studied for sampling of attributes as well as sampling of variables. T/F.
20. The hypothesis are test on a predefined level of significance.. T/F

**Que 3: Fill in the blanks**

**Marks[20]**

1. Hypothesis testing will result in either \_\_\_\_\_ or in \_\_\_\_\_ it. (Accepting/rejecting, throwing/picking)
2. At the end of the report appendices includes/end-list \_\_\_\_\_ data. (raw data, process data , technical data).
3. Good search is \_\_\_\_\_ and \_\_\_\_\_. (Systematic/Non Systematic, Logical/Descriptive)
4. Case Study is the popular form of \_\_\_\_\_. (Qualitative, Quantitative, Subjective)
5. Statistical Estimation means \_\_\_\_\_.
6. Multiple regression analysis is adopted when research has \_\_\_\_\_ variable, which is function of two or more independent variables.
7. Multivariate analysis of variance is an \_\_\_\_\_ of two way ANOVA. (extension, union, iteration)
8. A normal distribution a major of its skew-ness = \_\_\_\_\_. (-1, 0, +1)
9. \_\_\_\_\_ test is used in the context of analysis of variance. (ANOVA, Chi-Test, Z-Test)
10. For large size sample, the sample size is greater than \_\_\_\_\_. (30,50,100)
11. Maximum likely hood method is a method falling under the category of \_\_\_\_\_. (Factor analysis, Group analysis Regression analysis)
12. H<sub>0</sub> is \_\_\_\_\_.
13. H<sub>a</sub> is \_\_\_\_\_ hypothesis
14. Tabulation assembles \_\_\_\_\_ of data. (Mass, Group, Scattered)
15. Tabulation facilities the process of \_\_\_\_\_. (Comparison, data, value).
16. In the research data collection methods are \_\_\_\_\_ and \_\_\_\_\_.
17. Tme series analysis is used largely uin context of \_\_\_\_\_ and \_\_\_\_\_ researches. (technical, economic, business)
18. Irregular fluctuations are known as \_\_\_\_\_ fluctuations.(seasonal , random, predictable)
19. Secular trend is a \_\_\_\_\_ trend. (long term, short term)
20. Time series analysis is important in the context of \_\_\_\_\_ analysis. (long term, short term, both)

## Section B

[Answers to any question should not exceed more than five lines]

**Que 4: Attempt following question [any 4]**

**Marks[20]**

1. Assume that you have some text files and some image files from the web or from your own computer. Write the null hypothesis and alternative hypothesis for this experiment.
2. List steps to initiate the research,
3. List the different testing methods used to evaluate the computer science research?
4. List the features of functional model of the object modeling technique (OMT).
5. State the utility of M-file in MATLAB environment.

**Que 5: Write a short note on [any 4]**

**Marks[20]**

1. List various techniques for research and analysis of algorithms.
2. What are the different OOAD Methods?
3. Justify the use of MATLAB in Computer Science research.
4. Outline testing methods used in computer science research.
5. List various data analysis techniques

## Additional Question Bank

### SECTION A

1. The research question "What is the meaning of the lived experience?" is used in:
  - A. Ethnography
  - B. Phenomenology
  
2. Data collection for phenomenological research is done through:
  - A. Questionnaires
  - B. Interviews and observation methods
  
3. A process whereby data are analyzed by comparing data with other data as they are acquired during research is called constant comparative analysis. This method is used in:
  - A. Grounded theory research
  - B. Historical research
  
4. The qualitative approach that considers an idea or issue from all perspectives through an extensive exploration of the literature is called:
  - A. Philosophical inquiry
  - B. Quantitative analysis
  
5. The approach of understanding the 'natives' view of their world as an outsider is called:
  - A. Emic
  - B. Etic
  
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  - A. Ethnography
  - B. Phenomenology
  
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  - A. Informants
  - B. Participant/observers
  
10. The process of identifying meaning of human experiences through intensive discussion with persons who are living the experience is called:
  - A. Case study research
  - B. Phenomenological research
  
11. Phenomenological research may investigate "being in time."
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  - A. Inductive reasoning
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14. A typical number of participants in a qualitative study is:  
A. Large  
B. Small
15. Which method of research focuses on descriptions of cultural groups?  
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B. Case study
16. An investigation of a phenomenon by a few participants to discover meaning is called:  
A. Phenomenology  
B. Philosophical Inquiry
17. Phenomenology has its philosophical basis in:  
A. Science  
B. Philosophy
18. Ethnography has its foundation in:  
A. History  
B. Anthropology
19. Grounded theory has its base in:  
A. Symbolic Interaction theory  
B. Heideggarian theory
20. List three research areas where you can apply qualitative research.

## SECTION B

6. Briefly discuss domain of computer science research?
7. Outline the differences of computer research methods vs methodology.
8. List the various techniques suitable for data analysis.
9. Assume that you have some text files and some image files from the web or from your own computer. Answer the following question
  - a. How you can determine whether the mean compression rate of your program is higher for text or images or whether there is no difference. ?
  - b. Describe carefully the statistical tests and reasoning you use. ?
  - c. What is the null hypothesis for this experiment?
  - d. How much data are you basing your conclusions on?
  - e. Characterize the differences, if any, in the variance of your program's compression rate between text and images.
10. When you plan to initiate the research, what questions arise for the research directions?
11. List three research techniques used for algorithms analysis.
12. Outline the different testing methods used to evaluate the computer science research?
13. Define case study research method in computer science and give two examples.
14. Differentiate quantitative and qualitative computer science research methods.
15. What care is to be taken while writing a research paper?
16. State the importance of references in scientific research.
17. Explain the basic functions of system software tools.
18. Asynchronous communication.
19. What are terminal emulators? How they are useful to research?
20. Briefly discuss concurrency control in database environment.
21. List issues of window management.
22. List issues of keyboard management.
23. List out the various OOAD methods to design the application.
24. Outline the features of functional model of the OMT.
25. Outline the features of dynamic model of the OMT.
26. List the toolbox support in MATLAB
27. Tabulate function name, method, brief description for ODE(ordinary distinguished Equation) solvers
28. Use MATLAB to perform five operations on complex numbers.
29. Illustrate the use of MATLAB function to determine relative correlation between the two variables.
30. Illustrate the use of MATLAB plot function of MATLAB to draw 2D plot
31. Illustrate the use of MATLAB polyfit function to fit a curve
32. Justify the utility of M-file in MATLAB environment.
33. Write steps with MATLAB function/commands to obtain inverse of a matrix square
34. Write steps using MATLAB functions/command to obtain differentiation and integration of symbolic objects
35. Illustrate the use of ezplot function of MATLAB

## **Paper-II**

### **Scientific Communication**

#### **Section-A (Common for all faculties)**

1. Basics of Communication skill.
2. English Grammar
  - a) Word Choice, Sentence Structure, paragraph structure
3. Types of Scientific Communication.
4. Importance of publishing research paper
5. Publishing paper :
  - a) Preliminaries, Format, Choosing Journal
  - b) Title, Running Title
  - c) Authors: Single and Multi authorship
  - d) Writing Abstract
  - e) Selecting Keywords
  - f) Introduction section
  - g) Materials and Methods Section
  - h) Result Section
  - i) Figures : Design Principles, Legends, Table components, Graphs: Types, Style, Tables v/s Graph
  - j) Discussion Section: Format, Grammar Style, Content.
  - k) Acknowledgements
  - l) References : Different Styles
  - m) Communication with the Editor, Handling Referees' Comments, Galey Proofs
6. Writing Review Articles
7. Preparing Posters for Scientific Presentation
8. Preparing and Delivering of Oral Presentation
9. Writing Practical Reports.
10. Avoiding Plagiarism
11. Research Grant funding Agencies, Preparing for application to grant providing Agencies.
12. Patent drafting and submission
13. IUPAC symbols and Terminology for physicochemical quantities and Units, SI prefixes, Fundamental Constants, Standard Abbreviations and Symbols
14. Preparing documents for Technology Transfers, MoUs, Confidentiality Agreements

#### **Reference Books:**

- 1) Study and Communication Skills for the Biosciences by *Stuart Johnson and Jon Scott*, Oxford University Press
- 2) Write and Publish a Scientific Paper by *Robert A. Day* Oryx Press
- 3) Scientific Easy when you know how by *Jennifer Peat* BMJ Books
- 4) Research Projects and Research Proposals A Guide for Scientists Seeking Funding by *Paul G. Chapin* Cambridge University Press

## **Section – B (Faculty of Computer Science)**

### **Exposure on**

- Study of general guidelines for authors in journals
- Study of research papers in the area of interest
- Analysis of studied research papers
- Planning for research paper
- Components of the planned research paper
- Critical parameters of each component
- Compilation of manuscript
- Preparation of Hardcopy and Softcopy version of manuscript
- Selection of Journal
- Submission of manuscript
- Final Submission of paper after review comments
- Select an area from emerging technologies
- Plan for an innovative project
- Plan for project proposal
- Compilation of proposal with data
- Selection of funding agency (UGC, AICTE, GUJCOST, DST, IT Ministry, CSIR, etc.)
- Submission proposal to the agency.
- Use of MS-VISIO, MATLAB, LABVIEW for scientific visualization of data.

### **Evaluation:**

**Evaluation:** [Based on university examination, 100 marks paper of 3hrs]

Section A will be having a weightage of 60 marks. Questions will be of objective types.

Section-B marks will be having a weightage of 40 marks. Answers to any question should not exceed more than five lines.



Model Question Paper:

Kadi Sarva Vishwavidyalay

Ph. D Course Work

Paper-II Scientific Communication

Duration 3 hrs.

Total Marks: 100

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**Section A**

**Que 1: Answer the following objective questions**

**Marks[20]**

- (1) The order of research papers would be :
  - (a) title, topic , plan
  - (b) redraft , review, analyse
  - (c) report , result ,discussion
- (2) The standard format of scientific paper is :
  - a. title , abstract ,introduction
  - b. acknowledgement, result, keywords
  - c. statistics , printing ,calculations
- (3) The three main ways of presenting statistical data are :
  - (a)text ,table , graphs
  - (b)images ,check list , discussion
  - (c) Histograms , result , reference
- (4) The characteristics of effective presentation :
  - (a)relevant , informative, well structured
  - (b) objective , discussion ,graph
  - (c) title, calculation, reference
- (5) It is used to separate distinct phrases
  - (a) comma
  - (b) full-stop
  - (c) Apostrophe
- (6) Abbreviations are generally put into
  - (a) Brackets ( )
  - (b) Punctuations
  - (c)Box
- (7) A paragraph is usually made up of
  - (a) Several sentences
  - (b) Idiom phrases
  - (c ) Prepositional phrases
- (8) A paragraph development has following components
  - (a) Topic, coherence, unity, development
  - (b) Topic, repetition, summary
- (9) Deliberate plagiarism is
  - (a) Copying, collaborating,
  - (b) Ignorance, poor planning
- (10) In the research paper following terms should be avoided
  - (a) Contrast (but, yet, still)
  - (b) Conjunctions (and, punctuations)
- (11) The scientific writing commonly involves
  - (a) Active voice
  - (b) Passive voice
- (12) What should be use to introduce a quotation or list of an example
  - (a) Semi-colon;
  - (b) Colon:

- (13) Which of the following is used to depict the clarity in diagram  
 (a) Legends  
 (b) Pictures
- (14) Representation of the reference should be in  
 (a) Ascending order  
 (b) Descending order
- (15) “Et ali” is a Latin term which means  
 (a) And others  
 (b) Followed by others
- (16) A scientific presentation should be  
 (a) Precise  
 (b) Lengthy
- (17) Plagiarism destroys  
 (a) Independent thinking  
 (b) Dependent thinking
- (18) Understanding while listening is known as  
 (a) Engage listening  
 (b) Evaluating
- (19) To display data related to frequency we use  
 (a) Histograms  
 (b) Holograms  
 (c) Scattered graph
- (20) Which of the following tool is used to manage the tabular data?  
 (a) Spreadsheets  
 (b) Word processors

**Que 2: Answer the following True/False**

**Marks[20]**

- 1) Lecturers are merely about information from the lecture to the audience.
- 2) Plagiarism of content should not be avoided.
- 3) Plagiarism is used to make copy from one source to another.
- 4) Commas can be used to separate items in a list.
- 5) The colon is used to link two similar statements.
- 6) While writing an essay emphasize should be given to diagrams or other forms of illustration.
- 7) Textbooks are often written by large team of authors.
- 8) In a research paper the result section contains quantitative data analyzed by statistical techniques.
- 9) Abbreviations are used to write lengthy terms.
- 10) A title should not be given to the illustration.
- 11) Referencing should be omitted at end of the academic writing.
- 12) Appropriate strategy should not be adopted for your research work.
- 13) When searching for specialist scientific information, then academic journals should be main (primary) source of information.
- 14) The major web search engines can be used to scan literary pages of information for your research paper.
- 15) Citation are the specific acknowledgement to other people, these will the name of the person and the date.
- 16) The writing up your practical work is the initial stage of the process.
- 17) During the experiment record your result carefully, clearly, identifying numerical values and the unit in which they are measured.
- 18) The abstract should not give essential information to the reader.
- 19) The conclusion of research should be related back to the initial aim.
- 20) The title should be lengthy and less informative.

**Que 3: Fill in the blanks**

**Marks [20]**

- (1) A \_\_\_\_\_ is for producing list of key headings, subheadings and specific details.  
 (Visual plan, Linear plan)
- (2) \_\_\_\_\_ is a common problem in all universities. (plagiarism, collaboration)
- (3) \_\_\_\_\_ are used at the end of your research papers. (Introduction, bibliography)
- (4) \_\_\_\_\_ is the process of acknowledging any form of idea, information, illustrations, experimental methods, computer programmes etc. (referencing, citations)
- (5) \_\_\_\_\_ section describes the way in which research was undertaken. (discussion, methods)

- (6) \_\_\_\_\_ is the short descriptor of the paper.(title , abstract)
- (7) \_\_\_\_\_ provide unpublished information. (lectures , course)
- (8) A bigger class makes individuals within the class more \_\_\_\_\_.(anonymous , relationship)
- (9) \_\_\_\_\_ are used to denote short forms.( abbreviations , title)
- (10) \_\_\_\_\_ indicates the end of a sentence. (colon , full stop)
- (10) \_\_\_\_\_ should be written at the end of writings .(referencing, introduction)
- (11) \_\_\_\_\_ may be seen a little harsh and deliberate.(self plagiarism , accidental plagiarism)
- (12) \_\_\_\_\_ should provide the essential information to the reader. ( abstract , discussion)
- (13) \_\_\_\_\_ are less frequently used than commas .( semi colon ,full stop)
- (14) Describe is often used to mean the same as \_\_\_\_\_. (compare , discuss)
- (15) \_\_\_\_\_ are used to expand knowledge and understand the topic.( text book, lecture notes)
- (16) \_\_\_\_\_ is the online encyclopedia.( wikipedia , google)
- (17) \_\_\_\_\_ and \_\_\_\_\_ are important stages of writing essays.( reviewing and redrafting , rereading and reanalyzing)
- (18) \_\_\_\_\_ is very important part of learning process.( feedback , essay)
- (19) \_\_\_\_\_ section is the core of the report.(result , text book)
- (20) \_\_\_\_\_ are very useful for presenting data in an organized form.( table , graph)

### Section B

[Answers to any question should not exceed more than five lines]

**Que 3: Attempt following question [any 4]**

**Marks[20]**

1. List care taking features while writing an algorithm..
2. Select a tool to represent data model and list its features.
3. List components of research paper to be published in journal.
4. Illustrate reference writing in a thesis.
5. Write elegant to extract data in interview process from a prominent person.

**Que 4: Write a short note on [any 4]**

**Marks[20]**

1. List funding agencies for the computer science research.
2. List current areas of research for research project proposal
3. Steps to be considered for submitting the proposal to funding agencies
4. List standards used for software development.
5. Justify the need of functional decomposition diagram.
6. enlist the utility of CASE tools.

1. Question paper can have objective/short question (as per the subject wise weight age) etc.
2. Internal options to be given in each question.

## Additional Question Bank

### Scientific Communication

#### SECTION A

1. How can a Word Template be designed for any reputed Site? Give technical format.
2. How can the sections be distinguished in journal writing?
3. What will be the effective factors for a good report generation?
4. During a lecture session, how can a priority be set up in preparing notes and listening?
5. Give some general guidelines for authors in journals
6. On what strategies can analysis be done while studying research papers?
7. List out the components of the planned research paper
8. What are the areas to be considered while compiling manuscript?
9. How is effective planning done for project proposal?
10. The reader should be intrigued within the first 5 minutes of reading; excited within 15 minutes; satisfied after 45 minutes. Rationalize your ideas.
11. If your research paper has been rejected, how will you analyze the lapses?
12. How can the different types of publications be referred? Give technical details.
13. What is the good structured paragraph mean/
14. What are the points to be remembered while referring to a figure?
15. List some skills required in designing knowledge of dissertation?
16. How can research work be defined?
17. After a paper is written, what factors should be considered before presentation?
18. What are the two options considered for preparing a good, effective notes after attending planning for a research paper?
19. "Plagiarism of a content should be avoided" Justify the statement
20. What is the difference between citing and referencing?
21. What is the standard format for scientific paper?
22. Explain the structure of representing a research paper?
23. Give a brief description of note making strategies?
24. Distinguish verbatim notes and outline notes.
25. What are the factors involved for producing a good presentation?
26. Explain the characteristics of effective scientific presentation?
27. What is the planning required for overcoming anxiety in spoken presentation?
28. What are the different types of visual aids used in presentation?
29. What goes in the reference depends on the type of publication? (give the format)
30. "Don't overuse typographic tools" Justify the statement.

#### SECTION B

6. While writing an algorithm what you should take care? Give an example.
7. What tool do you use to represent data model to represent the conceptual schema which shows association among the data clearly and give the important features to use that tool.
8. How you can write  $H_0$  hypothesis for the research problem?
9. List different steps in writing research report?
10. For the data collection for your research study from prominent person in firm (i.e VP), how do you frame interview set of questions?
11. List out the three names of funding agencies for the computer science research.
12. What are the steps to be considered for submitting the proposal to funding agencies?
13. Write the standards to be followed while documenting KAPs for level 3-(defined)?
14. What is the purpose of Functional Decomposition Diagram?
15. What is purpose of the CASE tools for documentation?

## **PAPER III (Faculty of Computer Science)**

### **RECENT TRENDS IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

#### **DATA MINING AND DATA WAREHOUSING (25%)**

Advanced Database Technologies  
Fundamentals of data warehousing and data mining  
Data Warehousing Architectures  
Data mining Techniques

#### **WEB TECHNOLOGIES AND SERVICES (25%)**

Web Application Architectures  
E-Payments Gateways and Mechanism  
E-Governance Systems  
E-Learning Systems

#### **SOFTWARE TECHNOLOGIES (25%)**

Programming Paradigms and Platforms  
Service Oriented Architectures  
Software Quality Assurance  
Software Testing  
Knowledge Management and Intelligent Systems  
Enterprise Application Integration: ERP Applications

#### **HARDWARE AND NETWORKING TECHNOLOGIES (25%)**

Processor Architectures  
Operating Systems  
Embedded Systems  
Networking Technologies  
Next Generation Heterogeneous Networks

**Evaluation:** [Based on university examination, 100 marks paper of 3hrs]

Section A will be having a weightage of 60 marks. Questions will be of objective types.

Section-B marks will be having a weightage of 40 marks. Answers to any question should not exceed more than five lines.

**Section A**

**Que 1: Answer the following objective questions**

**Marks [20]**

1. Which of the following is true in the context of Inter-process communication:
  - a. It is like a user defined procedure call.
  - b. It is like user defined a function call.
  - c. It is a system call.
2. For IPC communication the OS employs an internally defined data-structure which is defined:
  - a. In user space
  - b. As a separate area which is neither in user space nor in kernel space
  - c. In kernel space
3. Which of the following are characteristics of an RDBMS?
  - a) It cannot use SQL.
  - b) Queries are possible on individual or groups of tables.
  - c) Data are organized in a series of two-dimensional tables each of which contains records for one entity.
  - d) Keys may be unique or have multiple occurrences in the database.
  - e) Tables are linked by common data known as keys.
4. With SQL, how can you return the number of records in the "Persons" table?
  - a) SELECT COLUMNS(\*) FROM Persons
  - b) SELECT COUNT() FROM Persons
  - c) SELECT COUNT(\*) FROM Persons
  - d) SELECT COLUMNS() FROM Persons
5. Which of the following is not an example of spatial data?
  - a) Points showing location of discrete objects.
  - b) Lines showing the route of linear objects.
  - c) Times of particular events.
  - d) Polygons showing the area occupied by a particular land use or variable.
6. A transaction processing system is concerned with
  - a) Operational day-to-day activities.
  - b) Strategic decision-making support.
  - c) A large database of specialised knowledge.
  - d) Support for an organisation's management needs

7. Which of the following is not a component of an information system?
- Equipment
  - End-user
  - Organisational goals
  - Procedures
8. Web-based solution has been developed and needs to be tested. Which attributes should be tested?
- Useability, functionality, spelling.
  - Useability, spelling, presentation.
  - Useability, functionality, presentation.
  - Spelling, functionality, presentation.
9. What is the result of  $16 \gg 2$ ?
- 4
  - 8
  - 3
  - 0
10. Consider a linked list implemented of a queue with two pointers: front and rear. What is the time needed to insert element in a queue of length of n?
- $O(\log 2n)$
  - $O(n)$ .
  - $O(1)$ .
  - $O(n \log 2n)$ .
11. Fetching past the last row of a cursor
- Raises the NO\_DATA\_FOUND Exception
  - Raises the VALUE\_ERROR Exception
  - Raises the CURSOR\_NOT\_FOUND Exception
  - Does not raise an exception
12. What is the correct syntax of the declaration which defines the XML version?:
- `<xml version="1.0" />`
  - `<?xml version="1.0"?>`
  - `. <?xml version="1.0" />`
  - None of the above
13. Pick up the odd one out of the following:
- data flow design
  - object identification
  - structural decomposition
14. The Internet was originally a
- LAN at MIT
  - Code-cracking network during World War II by the U.S. Defense Department
  - A network cooperatively created by several large hardware and software companies
  - A small experimental research network called ARPANET
  - A Microsoft product that quickly became too big for the company to control
15. Specialized servers are used on the Internet to
- Function like email post offices
  - Accept FTP requests to upload the download files
  - Store applications that are rented or leased by large corporations
  - Store and send Web pages
  - All of the above

16. Quicktime, RealOne, and Shockwave are among the most popular Web browser
  - a. Plug-ins
  - b. Cookies
  - c. Cascading stylesheets
  - d. Search engines
  - e. Security tools
17. Which of the following is the form of push technology that has been embraced by most Internet users?
  - a. Peer-to-peer sharing
  - b. Web searching
  - c. FTP
  - d. email
  - e. grid computing
18. Which of these types of Internet connections is typically the slowest?
  - a. Direct connection through T1 lines
  - b. Dial-up modem connections through phone lines
  - c. DSL connections through phone lines
  - d. Cable modem connections through cable TV lines
  - e. Satellite connections through satellite dishes
19. An online shopping catalog for a large outdoor outfitter is almost certainly
  - a. A data-driven Web site that separates site content from design
  - b. Carefully hand-coded in pure HTML to minimize errors
  - c. Designed to work without cookies
  - d. Limited to work with a single type of Web browser for consistency
  - e. All of the above
20. Telephone systems may be classified as:
  - a). simplex and asymmetrical
  - b). duplex and asymmetrical.
  - c). duplex and symmetrical.
  - d). simplex and symmetrical

**Que 2: Answer the following True/False**

**Marks[20]**

1. As a function fork evaluates to true in parent.
2. Redundancy is minimized with a computer based database approach.
3. A row in a database can also be called a domain.
4. In a networked web based GIS all communications must go through an internet map server.
5. Human factors influence the success of GIS as a decision support tool.
6. Unicode characters can be represented by hexadecimal numbers.
7. No column of a Non-key preserved table can be modified through a view.
8. Windows.h is a master include file that includes other Windows header files.
9. The Unicode character and a wide character are same.
10. Windows directly places the keyboard messages into the application's message queue, when a key is pressed and released.
11. Windows maintains a system message queue for the keyboard messages.
12. When packets collide on an Ethernet network, the packet with highest address goes first.
13. When two simultaneous transactions are running, one is reading a value and another is writing a value this situation is known as conflict.
14. Data warehouse is an essential to carry out data mining.
15. HTTP is connectionless protocol.
16. A MIDI sequences as digital recording of a human speech.
17. Wave form audio is analogues to bit map graphics, MIDI music is analogues to vector graphics.
18. The file extensions of .wmf indicate vector graphics format.
19. a 256 gray scale graphics requires 8 bits of each pixel.
20. Router device is used as the part of network layer of the standard OSI network model.



**Que 3: Fill in the blanks****Marks [20]**

1. To print the message along with the variable ew use the package \_\_\_\_\_ .
2. To select data from a range of values \_\_\_\_\_ operator is used.
3. A \_\_\_\_\_ expression returns either TRUE or FALSE.
4. \_\_\_\_\_ number of columns can be used in an ORDER BY clause.
5. Just as the entry point to a C program is the function main (), the entry point to a Windows program is \_\_\_\_\_ . (WinMain(), Win32() )
6. The three main Windows libraries are \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_. (Kernel.32, User32, GDI32,)
7. The size of Unicode character is \_\_\_ bits.(16,32,64)
8. \_\_\_\_\_ twisted pair cabling can you use for 10baseT networks with transmission speeds of up to 10 mbps?
9. Files send to a network printer are placed in \_\_\_\_\_. (Spooler, buffer)
10. A \_\_\_\_\_ is a small circuit board design to plug-in to in expansion slot on a computer main board. (NIC, MAC)
11. SOA stands for \_\_\_\_\_.
12. To run a program on a remote hot you can use internet service called \_\_\_\_\_. (Telnet, vi)
13. \_\_\_\_\_ is a method for transferring files from one computer to another.
14. Each web page has unique address that is called a \_\_\_\_\_. (URL, WRL)
15. A video is composed of a series of \_\_\_\_\_. (frames, slides)
16. Middleware means \_\_\_\_\_.
17. Video is displayed with \_\_\_\_\_ per second.
18. When two transactions are waiting for each other to release the data , this situation is known as \_\_\_\_\_.
19. Compressing a file is called \_\_\_\_\_, uncompressing a file is called \_\_\_\_\_.
20. Tuple is know as \_\_\_\_\_.

**Section B****[Answers to any question should not exceed more than five lines]****Que 4: Attempt following question [any 4]****Marks[20]**

1. Normalisation is the process to reduce the redundancy and inconstancy” Justify your answer.
2. Illustrate multi-dimensional angles data cube.
3. List the steps for payment gateway process?
4. Outline the major benefits of e-Learning.
5. List out the major benefits of e-Learning.

**Que 5: Write a short note on [any 4]****Marks[20]**

1. Give some examples of tag based programming and OOP.
2. List the components of cloud computing.
3. Differentiate between static and dynamic web services
4. What is the purpose of context switching between processors fulfill?
5. Illustrate sub-Netting mask and its features

1. Question paper can have objective/short question(as per the subject wise weight age) etc.
2. Internal options to be given in each question.

Additional Question Bank  
**RECENT TRENDS IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**DATA MINING AND DATA WAREHOUSING**

(25%)

**Advanced Database Technologies**

1. How is snapshot agent responsible in the database management?
2. Discuss the architecture of the RDBS. (Any ORACLE, Sequel Server etc).
3. Discuss the concept of RMAN in ORACLE
4. Normalisation is the process to reduce the redundancy and inconstancy” Justify your answer.
5. Differentiate the use of ER – Model and Relationship diagram for developing the conceptual data design.
6. “Data is assets for the corporate” Justify your answer.
7. Discuss the use of privileges in the database system.
8. Explain the Backup and Recovery mechanism in DBMS.
9. Discuss the mapping between conceptual schema , logical schema and physical schema for the database architecture.
10. Discuss the concurrency control in DDBMS.

**Fundamentals of data warehousing and data mining**

11. Is Data Warehousing a pros or a con for an ideal manger?
12. Does OLTP has an advantage over OLAP? Justify your answer,
13. Data cubes deal in multi-dimensional angles. How can computations be performed on Data Cubes?
14. How does Data Mining impact Social sphere in a company?
15. Why is it important to trace outliers?
16. What are fundamental stages of Data Warehousing? Offline Operational Databases
17. Distinguish between OLTP, OLAP and Data Mining.
18. Discuss the key success factor to implement DW project.
19. What are the different users for the DW environment.
20. Explain information cube in DW.

**Data Warehousing Architectures**

21. Selecting server architecture is a key decision. Rationalize this statement.
22. How does Data repository affect our database?
23. Mark the importance of middleware?
24. Compare and contrast Virtual data warehouse and Distributed Data Warehouse.
25. How do you develop your fresh Data Warehouse increment when your architecture is new and fresh?
26. Data Warehouse is an iterative process that follows a spiral pattern. Substantiate your ideas.
27. What Data integration and transformation?
28. Explain data transformation?
29. Explain E, T, L in terms of DW.
30. Explain Virtual DW.

**Data mining Techniques**

31. Explain data mining query language?
32. Explain visualization of discovered patterns?
33. Explain association rule mining?
34. Explain issues regarding classification and prediction?
35. Explain Bayesian classification?
36. Explain types of data in cluster analysis?
37. Explain partition-based methods?
38. Explain hierarchical based methods?
39. Explain data mining system products and research prototypes?
40. Explain data mining and intelligent?

**WEB TECHNOLOGIES AND SERVICES**

(25%)

**Web Application Architectures**

41. Can virtual company emerge over internet?
42. How does proactive intrusion prevent the flow information?
43. How to create web services in .Net?
44. Give the difference between HTML and XML?

45. write about web gardening and web farming.
46. explain in brief about generic HTTP and HTTP servlets?
47. Explain various components of web application architectures.
48. What would be the impact of AJAX in Web application?
49. Discuss the application of middleware in web based application.
50. Name the few difference between .net application and Java application.

### **E-Payments Gateways and Mechanism , E-Governance System and E-Learning System**

51. List the various collaborative facilities available in e-learning?
52. What are the steps for payment gateway process?
53. Difference between notify URL and return URL in PayPal payment gateway.
54. Explain the major benefits of e-Learning.
55. How e-learning system works?
56. Discuss the application of e-learning system.
57. Discuss the application of e-governance.
58. Identify the best software technology which can be used to develop the e-learning system.
59. E-commerce has replaced the brick and mortar approach of business: give your view.
60. What are other mechanisms (like interfaces, security aspect etc) is used in e-governance?

### **SOFTWARE TECHNOLOGIES**

**(25%)**

#### **Programming Paradigms and Platforms**

61. Can we hide a form during execution using Hide property? Give reasons.
62. What is the term that describes methods that execute using synchronous processing?
63. Compare and contrast tab and stacked canvases?
64. Compare of servlet and CGI.
65. Give some examples of tag based programming and OOP.
66. List the components of cloud computing.
67. Does schema emerge over DTD(document type definition)? If yes, justify
68. Discuss an another way for not overwriting servlet?
69. How to handle garbage collector in .Net?
70. What is daemon thread in JAVA?

#### **Service Oriented Architectures**

71. Compare agent based and component based Architecture
72. What is the role of web services adapters in SOA.
73. Differentiate between static and dynamic web services
74. What are the factors involved in designing SOA?
75. How you can achieve loose coupling in a SOA?
76. Discuss the common pitfalls of SOA.
77. What is important to adopt: a technical skill or cultural? Justify your answer.
78. What is difference between services and components?
79. What is the impact of SOA in development of IS?
80. For service identification which approach is better top-down Or bottom-up encourages re-use and maintenance.

#### **Software Quality Assurance**

81. During the parallel run is implemented in implementation phase, what are the activities to be considered?
82. If SQA( software quality assurance) is carried at end of the project, How does software implementation gets affected?
83. list out a live tool used in s/w testing.
84. Differentiate validation and verification with an example.
85. "Quality audit is required in the system development" Justify the answer.
86. Give your opinion for automated software quality will improve the software quality.
87. What are the quality management factors are required to establish better quality system?
88. Distinguish between QA and Software testing.
89. Define the term quality policy for the quality system.
90. What is quality circle?

### **Software Testing**

91. Explain about a live software testing technology?
92. Does “demolition squad” fulfill the requirements of clients? Justify your answer.
93. “The perfect software Is a myth.” Justify in technical terms.
94. Debate “ Testing should be conducted by a third party”.
95. How does Path coverage Criteria benefit over Edge Coverage Criteria?
96. In which situation you can plan for applying the agile testing?
97. Give one of the situation in which we need to you boundary analysis in testing.
98. Give the test case for any of the program logic of your choice.
99. How you can define the degree to which a system or component facilitates the establishment of test criteria and the performance of the tests to determine whether those criteria have been met?
100. Distinguish debugging and testing.

### **Knowledge Management and Intelligent Systems**

101. How is knowledge management and Management information systems differed?
102. Explain the features of knowledge portal?
103. Discuss the various designing goals for KM system.
104. Discuss the impact of KM in business problem solving.
105. “Organization process and technology are vital components of KM system”. Justify your answer
106. Give your opinion for the statement “KMS is encouraging knowledge sharing”
107. How you can say that Information Technology is an enabler for the KM?
108. Differentiate tacit knowledge and explicit knowledge.
109. Give the skeleton of KMS architecture for any hypothetical organization.
110. Explain the term intellectual capital.

### **Enterprise Application Integration: ERP Applications**

111. How is conventional application package and ERP package differed?
112. Is it advantage for a company to develop its own ERP or use ERP from
113. Application service provider?
114. What are the few features of SAP application?
115. How does business affect by using e-business value chain?
116. Discuss the external and internal constraints in the development of ERP system.
117. Discuss the various aspect of the ERP system failure in an organization.
118. ERP systems provide information integration ! give your comments on it.
119. How the change management is affecting the ERP?
120. Give the one ERP application tool available and list out its features.

## **HARDWARE AND NETWORKING TECHNOLOGIES**

(25%)

### **Processor Architectures**

121. What are the ideal conditions for instruction pipelining?
122. How does a microprocessor response to an interrupt with respect to a pin configuration?
123. What is the purpose of context switching between processors fulfill?
124. Explain the functioning of a graphic card board memory of 1MB?
125. What is the technique of virtual memory system with FIFO page replacement policy?
126. What is disk mirroring?

### **Operating Systems**

127. What are the factors options for monitoring a system performance?
128. What does the functioning of TSR(terminate and stay resident) program affect the system performance?
129. List out the technical differences between spooling and buffering?
130. We have to create a lab of 50 computers with the following hardware configurations. On Client side we have 256 MB RAM, P-4 processor, 20 GB HHDD, On server side : 4GB RAM, kaud core processor, 400 GB HDD. Which OS can be suggested at both sides for maximum utilization of HDD? Give technical reasons.
131. Compare GFS with other file systems.
132. When segmentation fault error does arise?

133. Registry is not used in LINUX. Justify

### **Embedded Systems**

- 134. Explain arm processors and arm micro controller?
- 135. How does RTOS work?
- 136. Describe the working of ES and GIS.

### **Networking Technologies**

- 137. Why is MAC address of a network adapter generated?
- 138. Why should we have a printer configured in a gateway?
- 139. What are the concerned layers of DOD model?
- 140. If your network is segmented into three parts. How is the list of resources from each segment replicated to all other segments?
- 141. What are the attributes of a software-based stripe set with parity on Windows NT Server?
- 142. Explain sub-Netting?
- 143. Compare IGRP, E-IGRP routing protocols?
- 144. How is SAMP used in windows platform?
- 145. Differentiate IP tables and TCP wrappers?
- 146. Write about encryption standards?

### **Next Generation Heterogeneous Networks**

- 147. "Technology enabled retail learning centers can be open to both students and non students" Justify this statement.
- 148. Describe Fuzzy logic strategy over Artificial Intelligence?
- 149. What is multiprotocol packet label switching (MPLS) and resilient packet ring (RPR)?
- 150. What is message oriented middleware (MOM)?

**Ph.D. Course Work**  
**Paper -3 Core Course for Education Faculty**

**Question -1 (Objective test items)**

**(40)**

- (1) Which system of Education was propounded by Mahatma Gandhi?
  - (A) Teaching by activities
  - (B) Basic Education
  - (C) Teaching Through music
  - (D) All of the above
  
- (2) One of the three Principles of shi Aurbindo's Education Philosophy is
  - (A) Everything can be taught
  - (B) Something can be taught
  - (C) Nothing can be taught
  - (D) None of the above
  
- (3) Experience is the real test of all situations the truth is that the one who gets success on these tests" This statement reflects which ism?
  - (A) Idealism
  - (B) Naturalism
  - (C) Experimentalism
  - (D) None of the above
  
- (4) Who emphasized that education is a man –making process?
  - (A) Vivekananda
  - (B) Rousseau
  - (C) Dewey
  - (D) Pestalozzi
  
- (5) The aim of the study of Vedanta scriptures is :
  - (A) Liberation from Avidya
  - (B) Achievement of self
  - (C) Brahman realization
  - (D) All the above
  
- (6) Who said that 'the aim of education should be in accordance with the feeling of international brother hood and attitude of international understanding for children's development'?
  - (A) Mahatma Gandhi
  - (B) Tagor
  - (C) Plato
  - (D) Dewey
  
- (7) Which philosophy says " Do not care to know various Theories about God and soul, do good and be good; that will take you to whatever truth there is'-
  - (A) Sankhya
  - (B) Buddhism
  - (C) Vedanta
  - (D) All the these:

- (8) Aiming at national unity and social Progress, Social change in India is threatened by:
- (A) Joint family system
  - (B) Student unrest in school and colleges.
  - (C) Caste
  - (D) Poor Political leadership
- (9) The ultimate goal of every individual lies in his:
- (A) Building up a good society
  - (B) Building up a strong society
  - (C) Building up an intellectual society
  - (D) Building up a highly industrialized society
- (10) As a society “Caste” is :
- (A) A closed Society
  - (B) An open Society
  - (C) A dynamic Society
  - (D) A dead Society
- (11) Which is not a characteristic of modernization?
- (A) Religious faith
  - (B) Participation
  - (C) Empathy
  - (D) None of it
- (12) Characteristic of the urban industrial family are :
- (A) Great degree of equality in roles.
  - (B) Isolation
  - (C) Separation of place of work and home
  - (D) All of the above
- (13) The word “Caste ” is derived from:
- (A) Latin
  - (B) English
  - (C) French
  - (D) Sanskrit
- (14) What is the most effective suggestion for National intercession? :
- (A) Political in egression
  - (B) Emotional in egression
  - (C) A+B
  - (D) None of it
- (15) Who produced the formula of Behavior = (S.D.H.T.A) ?
- (A) Gutheie
  - (B) Lewin
  - (C) Tolman
  - (D) Hull
- (16) A First generation learner ‘Suraj’ is studying in std-xii. If he is mal adjusted than, which one the best fitting situation for him?
- (A) Childhood
  - (B) Leterhood
  - (C) Ado lance
  - (D) Old age

- (17) Educational Psychology should provide prospective teachers with.
- (A) Insights into various aspects of modern education
  - (B) Principles insights and attitudes as points of departure for effective teaching
  - (C) Research procedures by means of which to evaluate current teaching procedure.
  - (D) Rules of thumb to deal with everyday class-room situation.
- (18) Mal adjustment and frustration are developed in children when.
- (A) They are not sending to school.
  - (B) Their need are ignored
  - (C) Their parent give them more love and affection than is due for them.
  - (D) They are not able to pass the examination.
- (19) Ashok becomes familiar with path way between hostels & home due to change in cognitive structure.
- (A) According to lewin's theory
  - (B) According to Hull's theory
  - (C) According to Tolman's theory.
  - (D) According to Guthrie's theory.
- (20) A student always loves to sit on last bench. What would be the most suitable reason for it?
- (A) who is very much afraid of the teacher
  - (B) who has come without complete home work
  - (C) who is not interested in study.
  - (D) who wants to talk with his neighbor.
- (21) You are teaching in the classroom and one student is busy reading a story book instead of attending his teacher how will deal with such case?
- (A) Ask the student to leave the story book and concentrate on the subject being taught.
  - (B) Reprimand the student and show him the way out of the class.
  - (C) Purposely ignore that student.
  - (D) Wait for another student to complain about that student. so that you may be able to file complain against him with the principal.
- (22) A Quality of class-room communication is not satisfactory one what would be the best cause for it ?
- (A) Disturbance
  - (B) Mass students
  - (C) Illiteracy of language
  - (D) above all
- (23) Which type of speech is required for class-room teaching?
- (A) Reliable
  - (B) dramatical
  - (C) harmonious
  - (D) loud one
- (24) Which methods is used generally far informed education?
- (A) Lecture method
  - (B) Experimental method
  - (C) Demonstration method
  - (D) Project method
- (25) Which one is the mostly used service available on internet?
- (A) E- learning
  - (B) E- commerce
  - (C) E -mail
  - (D) E- banking



- (26) Which of the following do you consider as cause for a teacher's maladjustment to the profession?
- (A) Limitations in his/her qualifications
  - (B) Not enough work to keep him/her engaged
  - (C) Too much of leisure and wishful thinking
  - (D) Poor relationship with colleagues
- (27) Which one of the following is an autonomous body related with teacher education?
- (A) U.G.C.
  - (B) N.C.T.E.
  - (C) N.C.E.R.T.
  - (D) All of the above
- (28) If a retire college teacher wants financial assistance for project work he/she should
- (A) Not do the same
  - (B) Approach N.C.E.R.T.
  - (C) Approach U.G.C.
  - (D) Approach the University
- (29) To make one's teaching more effective one should depend most on his
- (A) Management
  - (B) Knowledge
  - (C) Feed back
  - (D) Teaching
- (30) Which one is the best attraction to be a teacher?
- (A) The teacher is treated respected.
  - (B) The teacher can actuate his/her work by the students.
  - (C) There is much holidays in teaching.
  - (D) The teacher feels happiness in this profession by looking the children happy.
- (31) N.C.E.R.T has established Regional College of Education at
- (A) Bhopal
  - (B) Ajmer
  - (C) Bhuvaneshwar
  - (D) All of them
- (32) Educational objectives such as knowledge, understanding and application comes under category of :
- (A) Functional objectives
  - (B) General objectives
  - (C) Specific objectives
  - (D) Cognitive objectives
- (33) "Students can identified unrelated matter form given logic" – This behavioral out come is concern with the objective of
- (A) knowledge
  - (B) synthesis
  - (C) application
  - (D) analysis
- (34) Norm referenced test is used for
- (A) comparing achievement of an examinee
  - (B) measure the achievement of an examinee
  - (C) diagnosing the student's weakness
  - (D) Evaluating the curriculum plan instruction process.

- (35) Which one of the following is not a correct statement?  
(A) Test objectivity refers to a relation between subject and score.  
(B) Validity is an empirical relation between test scores and criterion scores  
(C) Reliability of a test is the consistency of test score  
(D) Reliability is a measure of variable error and Validity is the measure of constant error.
- (36) Scholastic achievement test is useful for  
(A) Evaluating the teacher  
(B) Pre practice of board exams  
(C) Promotion to the next class  
(D) All of the above
- (37) Essay type questions should be included in question paper because  
(A) they are useful in measurement in higher mental abilities  
(B) they widely cover subject content  
(C) they are easily adaptable in all school subjects  
(D) they are easy to construct
- (38) Which one of the following is the Recall type test item?  
(A) Alternative response  
(B) Identification  
(C) Analogy  
(D) Completion
- (39) Which one of the following conveys the meaning of the curriculum?  
(A) It is the organized form of subject matter.  
(B) It includes all the Learner's experiences in or outside school  
(C) The curriculum is the tool in the hands of the teacher to mould his students according to objectives of education.  
(D) All of the above
- (40) Who prepares the text book for primary school students in Gujarat?  
(A) Gujarat State School Text Book Board  
(B) Gujarat Council of Educational Research and Training  
(C) District Institute for Educational Training  
(D) Gujarat State Primary School Text Book Board
- (41) Which of the following is not true about curriculum?  
(A) It addresses the personal needs of pupil.  
(B) It addresses the intellectual needs of the pupil.  
(C) It addresses the social needs of the pupil.  
(D) None of the above
- (42) Why should we bring reforms in curriculum?  
(A) Because of explosion of the knowledge.  
(B) Because of increasing competition among educational institutions.  
(C) Because education is a life long process.  
(D) None of the above.
- (43) National Curriculum Framework for Schools is developed by  
(A) U.G.C.  
(B) N.C.E.R.T.  
(C) C.T.E.  
(D) S.I.T.

- (44) Which one of the following is an objective of curriculum?  
(A) To educate the child  
(B) To solve the problems of the society  
(C) To solve the teacher's problems  
(D) None of the above
- (45) What is measured by MMPI?  
(A) Intelligence  
(B) Interest  
(C) Aptitude  
(D) Personality
- (46) Which test of Wechsler –do you suggest for pre school?  
(A) WAIS  
(B) WISC  
(C) WPPSI  
(D) WBIS
- (47) For which test do you applied 19 pictured cards and one blank card?  
(A) Rorschach inkblot test  
(B) Thematic Apperception Test  
(C) Children's Apperception Test  
(D) None of it.
- (48) If you want to measure Art –ability of a child whose test will useful for the same?  
(A) K.G. Desai  
(B) Anil Ambasana  
(C) Mahendrika Bhatt  
(D) Dusyant Shukla
- (49) Which sequence is proper in the context of test construction?  
(A) Hypothesis – conclusion – data collection – data analysis  
(B) Data collection –Hypothesis –Sampling -Conclusion  
(C) Data collection – Data analysis –Sampling -Conclusion  
(D) Choice of problem – Hypothesis –Data collection –Conclusion
- (50) Which type of test will be most useful for illiterate Adult?  
(A) Verbal  
(B) Non -verbal  
(C) Verbal –Nonverbal  
(D) All the three
- (51) Which method is expensive and tough for estimating reliability  
(A) Test -Retest  
(B) Parallel forms  
(C) Split half  
(D) Kuder -Richardson.
- (52) Which of the following is not included in SWOT analysis?  
(A) Strength  
(B) Opportunity  
(C) Wealth  
(D) Threat

- (53) What do you mean by TQM?  
(A) Total quality management  
(B) Total quantity management  
(C) Total quality measurement  
(D) Total qualitative management
- (54) Which administrative leadership system do you consider reliable for sudden arising situation?  
(A) Autocratic leadership  
(B) Democratize leadership  
(C) Laissez Leadership  
(D) Co-operative leadership
- (55) According to theory of leadership, what is necessary for an ideal leadership?  
(A) Physical competency  
(B) Communicative competency  
(C) Moral competency  
(D) Emotional competency
- (56) Whom do you consider responsible for containing Classroom administration?  
(A) Principal  
(B) Parents  
(C) Teacher  
(D) Students
- (57) Which activity is helpful to provide direct and indirect experience to students?  
(A) Excursion  
(B) Class experience  
(C) Map reading  
(D) Above all
- (58) Whom do you consider as a base for social life?  
(A) School discipline  
(B) Physical Exercise  
(C) Competition  
(D) Habit of reading
- (59) The economical condition of Mitali is very poor. She wants to earn money after 12<sup>th</sup> commerce, which type of guidance will you provide her to achieve her goal?  
(A) Educational guidance  
(B) Vocational guidance  
(C) Personal guidance  
(D) Old age guidance
- (60) Sarala is having 125 I. Q. and she fails in std: 8<sup>th</sup>, which type of counseling she requires?  
(A) Counseling for Educational back ward child  
(B) Counseling for retarded child  
(C) Counseling for gifted child  
(D) Counseling for disability child

**Question - 2 Answer each of the followings in one or Two line**

**(11)**

- 1 Who has explained '3 H' with reference to the Education
- 2 In which year Employment Guarantee Plan was started?
- 3 Enlist any two non verbal test of Intelligence used to measure I.Q. of these students of std. 10.
- 4 What would be type of communication when a play is being telecast on Door- Darshan?
- 5 Binita having malnutrition what would be her main adjustment problems?
- 6 According to you , which is the most important objective of teacher training
- 7 At primary level ( P.T.C.).
- 8 Illustrate two situations in which on demand exams can be preferred?
- 9 Suggest the most important reform for present B.Ed Course.
- 10 Enlist any two non verbal test of intelligence used to measure I.Q. of the students of Std .X 9  
What do mean by administration?
- 11 Why one should provide guidance at secondary level?

**Question - 3 Answer each of the followings in three to four lines**

**(14)**

- 1 Clarify the term ' Jain' with it's meaning.
- 2 What is Equality of Education?
- 3 According to Tolman "Every behaviors is purposive and an associated and cognitive" How?
- 4 "Open examination is the best solution to make examinee free from mental stress" –Do you agree? Justify
- 5 Enlist any four important criteria for a internal evaluation of a text book.
- 6 Why does pilot testing is necessary far the construction of standardized test? How pilot testing will be used in test construction?
- 7 It some one offers you to be administrator or manager which one will you prefer? Justify it. Self evaluation.

**Question - 4 Answer each of the followings in Short**

**(15)**

- 1 How will you applied information and communication Technology in your class-room To make the teaching effective
- 2 "Defects in supervision of practice teaching at Teacher Education Institute lead to deterioration of the quality of teachers" – Do you agreed with it? Justify.
- 3 Clarify the concept of Guidance and mention scope of it.

## Ph.D. Course Work

### Paper -1 Research Methodology in Education

#### Section –B

#### Course :

- I Types of Research: Concept, characteristics, difference among, them: Fundamental, Applied & Action Research (4)
- II Areas of Research: Problems related to Content (school subjects), different stages (Primary to higher Secondary and Teacher Education) and Teaching process. (6)  
New emerging trends in Educational research
- III Source of Related literature and its effective use in selecting, designing and carrying out research work (3)
- IV Research Proposal (7)
- V Population, Sample and sampling techniques (5)
- VI Tools for data collection: Questionnaire, Rating scale, Attitude scale, standardized test: Concept, Process of construction, Advantages and Limitations (5)
- VII Descriptive Research (Survey, Experimental) and Qualitative Research: Concept, steps, types, Advantages and Limitations (6)
- VIII The writing of Research Report: Format, APA style for Foot-note and Bibliography Probable Errors And its precautions (4)

#### Questions Paper Format for sections: B.

- 1. 1 Very Very short answered questions 11X 1 = 11
  - 2. 2 short answered questions 7 X 2 = 14
  - 3. 3 short questions –issue-based 3 X 5 = 15
- 40

## Ph.D. Course Work

### Paper : 1 Research Methodology

#### (Part : B)

#### Model Question paper

#### Q. 1 Answer each question in one or two lines only.

- 1. Applied & Action Res. Whose findings are more applicable why.
- 2. What is the main limitation of Action Research?
- 3. As a class teacher, you feel that some students are not attentive in the class –room. Supposed you want to find-out its solution. Such study will fall in which area of research?
- 4. A researcher wants to study the contributions made by a institution in up-lifting deprived class-student. What would be your source of related literature?
- 5. If the population is homogeneous. What sampling technique will be the most suitable?
- 6. A researcher wants to identify indicators of successful teacher. Which one will be the best tool for data collection? Why
- 7. Why questionnaire is treated as a laziest way for data collection?
- 8. What is the main difference between Test and Inventory?
- 9. An investigator wants to study main and interaction effect of sex, std (8 to 12) and level of I.Q. (high, Ave. & Low). What would be the nature of his factorial design?
- 10. What would be content of preliminary part of a dissertation?
- 11. You have selected two successive quotations from the same book and from the same page. Which abbreviation will you use to write its foot-note?

**Q. 2 Answer each question in three to four lines only.**

1. Point out main two differences between applied research and fundamental research regarding researcher's qualities.
2. A researcher wants to conduct a qualitative research based on contribution made by one NGO. What would be source of related literature for reviewing the past researches?
3. If you want to submit your research proposal to a funding agency like NCERT. How your proposal will differ from your M.Ed. dissertation proposal?
4. Suppose you want to select two groups, true experimental design. What would be your sampling technique?
5. What is multi-stage –random sampling technique?
6. How will you validate the responses recorded on questionnaire by a respondent?
7. You have two different Research reports (M.Ed. & Ph.D.) without their titles. How will you identify them?

**Q. 3 Answer each question in about 125 words.**

1. What are the areas of research directly relevant with Learner and Teacher? Write three - three research problems related to both the aspects.
2. A class teacher observes that a group of students can't respond in the class-room due to their language disability. If the class teacher wants to prepare a remedial programme and wants to solve the problem. Work out the research work into important steps to be adopted.
3. An innovative teacher wants to practice three different teaching methods in three different equivalent groups. For that he has selected three equivalent teaching units from the present syllabus. Present the experiment diagrammatically and explain it in short.

**Ph.D. Course work for Education Faculty  
Research Methodology  
Paper B :**

**Assignments**

1. Select any area of Educational Research related to secondary, Higher secondary and Teacher education. Identify minimum 10 related researches quoted in Survey of Educational Research Vol II to Vol VI. Carry out its review. Make Meta analysis of the findings of selected researches and identify research gaps. Enlist at least five Research Statements based on research gaps so that one can carry out research in future.
2. Select any standardized test. Administer it on 100 students selected from 10 different schools of the same S.V. S. Prepare a report of it in the form of research paper.
3. Prepare and present a paper (Study paper or Research Paper) at state level or National level seminar. Submit it along with certificate issued by the seminar organizer.
4. Select any research problem related to class-room teaching –innovative practice and prepare a research proposal suit to the format prescribed by ERIC, NCERT, NCTE, NAAC or any equivalent funding agency.





## Table of Content

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**KADI SARVA VISHWAVIDYALAYA**  
**GANDHINAGAR**

**Ph.D. Course work for  
Pharmaceutical sciences  
2009-10**

**Course structure**

<b>Paper</b>	<b>Title</b>	<b>University Examination (marks)</b>		<b>Duration of exam</b>	<b>Schedule of exam</b>
		<b>Section A (general)</b>	<b>Section B (specialization)</b>		
<b>Paper-I</b>	<b>Research methodology</b>	<b>60</b>	<b>40</b>	<b>2 hrs</b>	<b>Every six months</b>
<b>Paper-II</b>	<b>Scientific communication</b>	<b>60</b>	<b>40</b>	<b>2 hrs</b>	
<b>Paper-III</b>	<b>(Recent Trends in Pharmaceutical Sciences)</b>	<b>100</b>		<b>2 hrs</b>	

**Detailed syllabus**

**Paper-I Research Methodology**

**Section-A ( Common to all faculty)**

**60 marks**

- 1) Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research 3
- 2) Defining the Research Problem : What is Research Problem?, Selecting the Problem, Necessity of and Techniques in defining the problem 6
- 3) Research Design: Meaning, Need, Features of Good Design, Concepts, Types. Basic Principles of Experimental Design, Developing a Research Plan 6

- 4) Sample Design : Implication, Steps. Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design. 7
- 5) Measurement and Scaling Techniques: Measurement in Research, Measurement Scales, Sources of Errors in measurement, Tests of Second measurement, Technique of developing Measurement Tools, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques. 10
- 6) Methods of Data Collection: Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of appropriate method for data collection, Case Study Method, Guidelines for developing questionnaire, successful interviewing. Survey v/s experiment. 10
- 7) Processing and analysis of Data : Processing Operations (Meaning, Problems), Data Analysis (Elements), Statistics in Research, Measures of Central Tendency, Dispersion, Asymmetry, Relationship. Regression Analysis, Multiple correlation and Regression, Partial Correlation, Association in case of Attributes 10
- 8) Sampling Fundamentals : Definition, Need, Important sampling Distribution, Central limit theorem Sampling Theory, Sandler's A-test, Concept of Standard Error, Estimation, Estimating population mean, proportion. Sample size and its determination, Determination of sample size Based on i) Precision Rate and Confidence level ii) Bayesian Statistics. 12
- 9) Testing of Hypothesis: Meaning, Basic concepts, Flow diagram, Power of a hypothesis test, Important parametric tests, Hypothesis Testing of Means, Differences between Means, Comparing Two related samples, Testing of Proportion, Difference between proportions, Comparing variance to hypothesized population variance, Equality of variances of two normal populations, hypothesis testing of Correlation coefficients, Limitations of Tests of hypothesis. 12
- 10) Chi- square test : Applications, Steps, characteristics, limitations 3
- 11) Analysis of Variance and Covariance : Basic Principles, techniques, applications, Assumptions, limitations.
- 12) Analysis of Non-parametric or distribution-free Tests : Sign Test, Fisher-Irwin Test, McNemer Test, Wilcoxon Matched pair Test (Signed Rank Test), Rank 7
- 13) Sum Tests : a) Wilcoxon-Mann-Whitney Test b)Kruskal-Wallis Test, One sample Runs Test, Spearman's Rank Correlation, Kendall's Coefficient of Concordance, Multivariate Analysis Techniques: Characteristics, Application, Classification, Variables, Techniques, Factor Analysis (Methods, Rotation), Path Analysis. 7

## Paper- I Research Methodology

### SECTION-B (For Faculty of Pharmacy)

40 marks

#### 1. **Pharmaceutics:**

Pharmaceutical Experimental Design: Factorial Designs, Fractional Factorial Designs, Rechtschaffner designs, D-optimal designs, Response surface methodology, Pharmaceutical process optimization and validation, Analyzing and minimizing variations in pharmaceuticals, Statistical experimental designs for formulations, Optimizing Formulations.

#### 2. **Quality assurance:**

Development, validation, optimization of analytical methods based on HPLC, HPTLC, spectrophotometry, spectrofluometry, Gas chromatography etc., Quality assurance in pharmaceutical Industries, Contract Research Organizations etc.

Experimental design in the planning of syntheses, multivariate analysis of chemical and biological data, statistical validation of QSAR results.

#### 3. **Pharmacology:**

Design and Statistical Analysis of experiments using laboratory animals, Sample size determinations in animal experiments, Controlling variability in animal experiments, Experimental designs for animal experimentations, Experimental methodology in Clinical Trials

#### 4. **Pharmacognosy:**

Experimental Design in preparing and optimizing herbal formulations, testing herbs/herbal material on animals/ tissues/cells/humans.

Reference Books: Latest Editions of following Books

- 1) Kothari, C.R., Research Methodology (Methods and Techniques), New Age Publisher
- 2) Fundamentals of modern statistical methods By *Rand R. Wilcox*
- 3) Power Analysis for Experimental Research A Practical Guide for the Biological, Medical and Social Sciences by *R. Barker Bausell, Yu-Fang Li* Cambridge University Press

- 4) Design of Experiments: Statistical Principles of Research Design and Analysis,  
by *Robert O. Kuehl* Brooks/Cole

# Research Methodology

## Model Question Paper

- Instructions :
- 1) Section-I is of 60 marks
  - 2) Section-II is of 40 marks
  - 3) There on negative marks for incorrect answers

Q1. Multiple Choice Questions. Choose one most correct answer from the provided choices. Write your choice on the right hand side column only. Illegibly written answers will not be considered. Each Question carries two marks.

- i) Why is a control necessary in a well done experiment?
  - a) To show what would normally happen and compare it with what happens when you change the independent variable.
  - b) To keep the experiment from from becoming chaotic.
  - c) So the experiment can be contained.
  - d) For graphing purposes only
- ii) Consider the following data:  
14; 16; 16; • 22; 25; 38; 38; 38; 38; 2000  
Which of the measures of central tendency would be the least useful?
  - a) mean
  - b) mode
  - c) median
- iii) As the degrees of freedom increase (and especially when the degrees of freedom are more than 90), the graph of the chi-square distribution looks more and more \_\_\_\_\_.
  - a) symmetrical
  - b) skewed right
  - c) skewed left
  - d) asymmetrical
- iv) The Goodness-of-Fit hypothesis test is typically a \_\_\_\_\_.
  - a) two-tailed test
  - b) wagging-tailed test
  - c) left-tailed test
  - d) right-tailed test
- v) Determine the sampling technique: A medical researcher does a random survey of 100 female doctors and 100 male doctors.
  - a) stratified
  - b) systematic

- c) simple random
- d) cluster
- vi) Following is not the example of tests.
  - a) Chi test    b) t-test    c) pie test    d) F-test
- vii) Following is not the part of basic principles of experimental designs
  - a) Replication    b) Randomization    c) Local Control    d) Reduction
- viii) Following is the type of informal experimental designs.
  - a) Before-and after with control design
  - b) b) Completely randomized Design
  - c) Latin square Design
  - d) Factorial Designs
- ix) For data that is normally distributed, is it possible for the standard deviation to be larger than the mean?
  - a) No.
  - b) Yes.
  - c) There is not enough information to determine.
- x) What is the difference between the independent and dependent variables in an experiment?
  - A. The independent variable is quantitative and the dependent variable is not.
  - B. The independent variable is what is changed and the dependent variable is what is measured.
  - C. The independent variable has disowned his parents and the dependent variable still relies on them for food, shelter, and gas money.
  - D. The independent variable is graphed on the y-axis and the dependent is graphed on the x-axis.

Q2. Fill in the Blanks:  
marks)

(2 x 10

- i) ----- refers to a design that has more than one independent variable.
- ii) ----- is an external variable that affects the internal variable and intertwines with other extraneous variables such that it is difficult to determine unique effects of each.
- iii) ----- is the non-manipulated variable in factorial design.
- iv) ----- is an arbitrary value, designated as the significance level.
- v) ----- is the measure of the flat-toppedness of a distribution curve
- vi) ----- factorial designs consider the effect of varying two factors on the dependent variable.

- vii) ----- technique is used design or plan the experiment in such a way that the variations caused by extraneous factors can all be combined under the general heading of “chance”.
- viii) ----- measures seperstely the relationship between two variables in such a way that the effects of other related variables are eliminated.
- ix) ----- defines the limits within which the parameters of the population are expected to lie with a specified degree of confidence.
- x) When there really is a difference (association, correlation) overall, but random sampling caused your data to not show a statistically significant difference, the errors responsible for this are called \_\_\_\_\_

Q3. Answer true or false for the following statements: A correlation coefficient: (4 marks)

- a. Should not be calculated when there is an underlying relationship between the two variables but it is not linear.
- b. Does not provide evidence of a causal relationship between two variables.
- c. Should not be used to judge the biological importance of the relationship between two variables.
- d. Should be performed only when certain assumptions are satisfied (e.g. variables measured on a random sample of individuals, both the variables are quantitative and at least one of the two variables need to be normally distributed).

Q4. Answer true or false for the following statements: The paired t-test: (5 marks)

- a. Tests the null hypothesis that the two population means are equal
- b. Must have equally sized numbers of observations in each group.
- c. Assumes that the data in each group are normally distributed.
- d. Is appropriate for comparing the means of independent groups of observations.
- e. When appropriately used, is more powerful when the sample size is large.

Q5. Answer true or false for the following statements (5 marks)

- a. The p-value is the probability of the sample data arising by chance.
- b. The p-value is an arbitrary value, designated as the significance level.
- c. The p-value is the chance of getting an observed effect if the null hypothesis was false.
- d. The p-value is the chance of getting an observed effect if the null hypothesis was true.
- e. A very small p-value allows us to say that there is enough evidence to accept the null hypothesis.



Q6. Match the following :

**A) Match the following examples with type of research design**

(5 marks)

**Example**

- i) Effect of digital BP instruments accuracy.
- ii) CVS Research in Institute during 1990-1995)  
Res. Studies.
- iii) Effect of temp on productivity
- iv) Effect of fertilizer X on plant cultivation
- v) Effect of mobile users and brain tumor.

**Research Design**

- a) Exploratory Research studies.
- b) Descriptive and Diagnostic
- c) Hypothesis Testing Research studies.

Q7. Write the below functions in sequence. (e.g. d-a-c-b-f-e)

(1 mark)

- a) Selection of samples.
- b) Analysis of data
- c) Designing the methods of data collection.
- d) Formulating the objective of study
- e) Report preparation
- f) Collection data

**SECTION-II**

**(Max. Marks -40)**

**Design an experiment for any one of the under mentioned research topic:**

- I) To prove that chronic Aspirin administration promotes gastric ulceration in rats.
- II) To prove that given HPLC method for determination of Ciprofloxacin in biological samples is more accurate, precise and reproducible than the UV spectrophotometric method.
- III) To prepare and evaluate a tablet dosage form of Paracetamol using three excipients and optimum temperature and humidity condition to achieve the dissolution, disintegration and hardness parameters equivalent to that of a standard market formulation.
- IV) You are given three herbal drug extracts which are reported to possess anti-inflammatory activity. Design an experiment to find out the optimum proportion of each of the extracts to be combined to achieve maximum therapeutic efficacy.

Note : The design should describe following :

- a) Type of design (e.g. Cross-over, 2 x 2 factorial etc.) 3 marks
- b) Sample size 2 marks
- c) Design table/ Flow chart 15 marks
- d) Parameters to be studied 3 marks
- e) Sample Selection method 5 marks
- f) Statistical Analysis to be involved in the study and the basis 12 marks

## **Paper-II Scientific Communication**

### **Section A (Common for all faculty)**

**60 marks**

1. Basics of Communication skill.
2. English Grammar
  - a) Word Choice, Sentence Structure, paragraph structure
3. Types of Scientific Communication.
4. Importance of publishing research paper
5. Publishing paper :
  - a) Preliminaries, Format, Choosing Journal
  - b) Title, Running Title
  - c) Authors: Single and Multi authorship
  - d) Writing Abstract
  - e) Selecting Keywords
  - f) Introduction section
  - g) Materials and Methods Section
  - h) Result Section
  - i) Figures : Design Principles, Legends, Table components, Graphs: Types, Style, Tables v/s Graph
  - j) Discussion Section: Format, Grammar Style, Content.
  - k) Acknowledgements
  - l) References : Different Styles
  - m) Communication with the Editor, Handling Referees' Comments, Galey Proofs
6. Writing Review Articles
7. Preparing and Delivering of Oral Presentation
8. Avoiding Plagiarism
9. Preparing documents for, MoUs, Confidentiality Agreements.
10. IUPAC symbols and Terminology for physicochemical quantities and Units, SI prefixes, Fundamental Constants, Standard Abbreviations and Symbols

### **Section B:**

**40 marks**

#### **Pharmaceutical Sciences:**

Exercises based on scientific writing skills in research publications relevant to Pharmaceutical Sciences.

#### **Reference Books:**

- 1) Study and Communication Skills for the Biosciences by *Stuart Johnson and Jon Scott*, Oxford University Press
- 2) Write and Publish a Scientific Paper by *Robert A. Day* Oryx Press
- 3) Scientific Easy when you know how by *Jennifer Peat* BMJ Books

- 4) Research Projects and Research Proposals A Guide for Scientists Seeking Funding by *Paul G. Chapin* Cambridge University Press

## **Model Question Paper for Paper-II (Scientific Writing)**

1) Which of the following is the most correct title for the provided abstract?

(4marks)

- a) Anti-staphylococcal activity and mode of action of clofazimine
- b) Bactericidal property of Clofazimine
- c) Cofazimine is effective against S.aureus

### **ABSTRACT**

**Objectives:** Infections caused by *Staphylococcus aureus* might be treated with agents whose primary indications are for other infections. Clofazimine, an established anti-mycobacterial drug, could be such a candidate. However, the anti-staphylococcal properties of clofazimine have not been fully described and its mode of action, possibly involving inhibition of both RNA polymerase and a membrane-located target, has not been explored in detail. We have now conducted experiments to address these issues. **Methods:** Using established procedures, we examined the activity of clofazimine against a range of clinical isolates of *S. aureus* and determined whether it was bactericidal, exhibited a post-antibiotic effect (PAE), or interacted synergically with other agents. The potential for emergence of clofazimine-resistant mutants was also examined. Mode of action studies involved macromolecular synthesis assays, cross-screening against rifampicin-resistant mutants, susceptibility of RNA polymerase to clofazimine in vitro and several methods to detect drug-induced membrane damage. **Results:** Clofazimine demonstrated good anti-staphylococcal activity encompassing MSSA, MRSA and GISA. It was bactericidal and resistant mutants could not be isolated. Clofazimine did not exhibit a PAE and failed to act synergically with other drugs. No evidence for specific inhibition of RNA polymerase was obtained. Clofazimine caused non-specific inhibition of DNA, RNA and protein synthesis, consistent with membrane-damaging activity that was detected in three independent assays for membrane disrupting agents. **Conclusions:** Clofazimine is a potent anti-staphylococcal agent. It appears to be a membrane-disrupting agent and does not inhibit RNA polymerase.

2) Choose the correct word from the given choices to replace the underlined word/fill in the blank in the given sentences-

(5 x 2 marks)

- a) Oral pediatric formulations of artemether are urgently needed, however the tablets are difficult to administer to young children, who cannot swallow whole tablets or tolerate the bitter taste of the crushed tablets.
  - a. Because
  - b. As
  - c. Since
  - d. however
- b) I \_\_\_\_\_ several eminent scholars in my study of herbal drug resources.”
  - i) Cited
  - ii) Sited
- c) The differences between the control and experimental groups were \_\_\_\_\_
  - i) Insignificant
  - ii) Nonsignificant
- d) Noradrenaline \_\_\_\_\_ contractile response on rat vas deferens

- i) elicit
- ii) illicit

e) Resistance to antibiotics is becoming \_\_\_\_\_ difficult problem in the management of bacterial infections.

- i) An Increasingly
- ii) More
- iii) Highly

Q 3. Answer in Short:

- a) Give full form of IUPAC (2)
- b) Enumerate three most commonly followed styles of referencing (3)
- c) What is Running title? (2)
- d) Differentiate between histogram and bar chart (2)
- e) Define Plagiarism (2)
- f) Enumerate components of a tabular representation of result data (2)
- g) Give the standard abbreviations of : (3)
  - I) milliliter
  - II) hour
  - III) minutes
- h) Differentiate between research paper and review article (3)
- i) Define “ Rapid Communication” (2)
- j) Differentiate Symposium, panel Discussion and Seminar (3)

Q4. True or False (If false provide the correct answer) (2 x 6)

- I) Passive voice is the most suitable sentence arrangement for scientific communication
- II) Discussion section of a research paper discusses only the results obtained in the study
- III) The first author is always the one who is the research guide and last author is one who is major contributor in experimental work.
- IV) The numbers mentioned in the result table can have any number of decimal points.
- V) Introduction section consists of summary of literature survey conducted prior to the study.
- VI) The tense used in result section is mostly present tense.

## Section –II

Q1. Provide the following for the given paper:

- a) Correct Title( not more than 50 letters) (5)
- b) Most suitable Keywords (2)
- c) Abstract ( not more than 250 words) (10)
- d) Headings, footnotes and Legends to figures and tables (5)

Q2. Describe the result section using the provided tables and charts. (8)

Q3. A) Write a paragraph (not more than 100 words) on “Current Status of Pharmaceutical Industries in Gujarat”.

Note : You should put stress on method of writing, grammar, flow of thoughts, conclusion. Accurate data are not required. (10)

**Paper-III                      Recent Trends in Pharmaceutical Sciences**  
**100 Marks**

Introduction and Applications of following:

- a) New Drug Development strategies (Definitions and basic principles only)
  - i. Combinatorial Chemistry
  - ii. QSAR/SAR
  - iii. Physicochemical Evaluation
  - iv. Drug bio-screening and evaluation (Preclinical and Clinical)
- b) Basic principles and applications of following:
  - i. Spectrophotometry
  - ii. Chromatography
  - iii. Dissolution testing
  - iv. Rheometry
  - v. ELISA
  - vi. Extraction methods for Herbal Drugs.
- c) Applications of Nanotechnology in Pharmaceutical Science

References:

- 1) Remington's Pharmaceutical Sciences –Latest Edition
- 2) Comprehensive Pharmacy Review by Leon Shargel and others–Latest Edition

**Model Question paper for PhD Coursework:**

**Paper-III Recent Trends in Pharmaceutical Sciences**

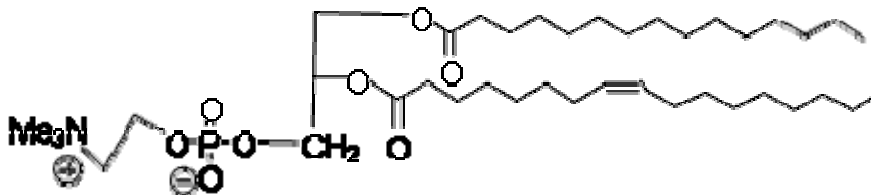
Q1. Multiple Choice questions:

(20x 1.5 marks)

- 1) Flame ionisation detector is used in \_\_\_\_\_ type of Chromatography method
  - a) HPLC
  - b) HPTLC
  - c) Gas Chromatography
  - d) Paper Chromatography
- 2) Wettability determination gives idea about
  - a) Type of dosage form
  - b) Type of packaging
  - c) Type of buffer
  - d) Type of manufacturing method.
- 3) Which of the following route of administration is fastest in making drug reach fastest in systemic circulation.
  - a) Oral
  - b) Intramuscular
  - c) Intravenous
  - d) Intraperitoneal
- 4) Effect of drug can vary due to :
  - a) Age
  - b) Body weight
  - c) Disease State
  - d) All of the above
- 5) Which of the following formulation provide longest duration of action
  - a) Capsules
  - b) Dispersible Tablets
  - c) Sustained Release Tablets
  - d) Solution
  - e) Suspension.



6) What type of molecule is the following structure?



- a) A protein.
  - b) A nucleic acid.
  - c) A phospholipid.
  - d) A carbohydrate.
- 7) What is meant by a binding site?
- a) The area of a macromolecular target that is occupied by a drug when it binds.
  - b) The portion of the drug to which a drug target binds.
  - c) The functional groups used by a drug in binding to a drug target.
  - d) The bonds involved in binding a drug to its target.
- 8) What does the symbol *P* represent in a QSAR equation?
- a) pH
  - b) plasma concentration
  - c) partition coefficient
  - d) prodrug
- 9) Which of the following statements is false when comparing 3D QSAR with conventional QSAR?
- a) Only drugs of the same structural class should be studied by 3D QSAR or QSAR.
  - b) 3D QSAR has a predictive quality unlike QSAR.
  - c) Experimental parameters are not required by 3D QSAR, but are for QSAR.
  - d) Results can be shown graphically in 3D QSAR, but not with QSAR.
- 10) Which of the following is NOT a laboratory safety rule?
- a) You should never mix acids with bases
  - b) You should tie back your long hair
  - c) You should never add water to acid
  - d) All of the above are valid safety rules
- 11) What piece of laboratory equipment is best-suited for accurately measuring the volume of

- a liquid?
- a) graduated cylinder
- b) beaker
- c) Erlenmeyer flask
- d) more than one of the above

12) Which piece of laboratory equipment can be used to store chemicals for long periods of time?

- a) buret
- b) evaporating dish
- c) beaker
- d) more than one of the above

13) The correct order for the basic features of a mass spectrometer is...

- a) acceleration, deflection, detection, ionisation
- b) ionisation, acceleration, deflection, detection
- c) acceleration, ionisation, deflection, detection
- d) acceleration, deflection, ionisation, detection

14) Which one of the following statements about ionisation in a mass spectrometer is incorrect?

- a) gaseous atoms are ionised by bombarding them with high energy electrons
- b) atoms are ionised so they can be accelerated
- c) atoms are ionised so they can be deflected
- d) it doesn't matter how much energy you use to ionise the atoms

15) Which one of the following pieces of information cannot be obtained from an infra-red spectrum?

- a) the molecular mass
- b) the presence of C=O bonds
- c) the presence of O-H bonds
- d) the identity of a compound through comparison with other spectra

16) The region of an infra-red spectrum where many absorptions take place is known as the...

- a) thumbprint region
- b) handprint region
- c) footprint region

d) fingerprint region

17) Proton nmr is useful for investigating the structure of organic compounds because...

- a) organic compounds contain carbon atoms
- b) organic compounds are mostly covalent
- c) hydrogen atoms are found in nearly all organic compounds
- d) organic compounds have low boiling points

18) In the double beam spectrophotometer, the primary source of light is divided into two beams of

- a. Equal intensity
- b. Reference & sample intensity
- c. Reference intensity
- d. As per instrument

19) In HPTLC, \_\_\_\_\_ is used as support for stationary phase :

- a. Silica
- b. Aluminium sheet
- c. Glass bead
- d. Agarose

20) Which of the solvents is most polar

- a) N-octane
- b) N-hexane
- c) Carbontetrachloride
- d) methanol

**Q2. Fill in the Blanks:**

**(21 marks)**

- 1) Middle IR range is \_\_\_\_\_.
- 2) Calibration Curve should obey \_\_\_\_\_ law.
- 3) Dissolution apparatus III is suitable for \_\_\_\_\_ dosage forms
- 4) Schedule \_\_\_ of Drugs and Cosmetics act refers to Drug Evaluation procedures
- 5) Angle of repose is used for determining \_\_\_\_\_ property of drugs and excipients.
- 6) \_\_\_\_\_ is widely used as a solvent for super critical fluid extraction
- 7) Total ash indicates the presence of \_\_\_\_\_ and \_\_\_\_\_ compounds
- 8) \_\_\_\_\_ and \_\_\_\_\_ extractive values are official in Indian herbal Pharmacopoeia.
- 9) HPTLC technique gives higher resolution than TLC techniques because of \_\_\_\_\_
- 10) Gas chromatography is not suitable for analysis of \_\_\_\_\_ type of compounds.

- 11) To work out the molecular mass of an organic molecule you would look at its \_\_\_\_\_ spectra.
- 12) Most common side effect of NSAIDS is \_\_\_\_\_.
- 13) For antiseptic effect minimum \_\_\_\_\_ % alcohol can be used.
- 14) Distil water is free from \_\_\_\_\_ .
- 15) GCP means \_\_\_\_\_
- 16) Most common drug used during headache is \_\_\_\_\_.
- 17) \_\_\_\_\_ and \_\_\_\_\_ are used most commonly during fever.

**Q3. True/False (correct the false statement)**

**(24 x 1.5 marks)**

- 1) Dissolution limit for modified release form is not less than 90% release in specified time.
- 2) Emission wavelength is always greater than excitation wavelength in Fluorimetry.
- 3) In Phase-IV Clinical Trials premarketing surveillance is conducted
- 4) Increased Serum Creatinine levels refers to possibility of hepatic damage.
- 5) Crystalline form of drugs are faster absorbed than amorphous forms.
- 6) LAL test is for pyrogen testing in mice
- 7) Toxicity testing are normally done in G.pigs
- 8) CPCSEA permission will be is require for Animal house registration.
- 9) All experiments in human require Ethics Committee permission.
- 10) Placebo formulation does not contain any active drug molecule.
- 11) Sublingual medicaments are used to bypass First Pass Metabolism.
- 12) Antiemetic study evaluation can be done on rats.
- 13) Ex-vivo experiments include partly invitro experiments also.
- 14) Last British Pharmacopeia is BP-2010.
- 15) Control groups are not required for anti-inflammatory study.
- 16) Diclofenac of new formulation permission is banned.
- 17) Patent Act in INDIA is applicable.
- 18) 95% alcohol (Ethanol) means spirit.
- 19) Disprin is generic drug.
- 20) Synthetic wool is not source from animal.
- 21) We can drink "Water for injection".
- 22) PPI- Proton Pump Inhibitors effects due to systemic effects.
- 23) All drugs have side effects.
- 24) Herbal drugs do not have Drug- drug interactions

**Q4. Match the Following:**

**(13 marks)**

A)

Instrument

1. Cup and Bob Viscometer
2. Cone and Plate Viscometer
3. Brookfield Viscometer
4. Penetrometer

Principle

- a) Shear thinning
- b) Plastic Flow
- c) Thixotropy
- d) Shear thickening

B)

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1) Volatile Oils                   | a) Super Critical Fluid Extractor |
| 2) Extraction of Phytoconstituents | b) HPTLC technique                |
| 3) Finger Printing                 | c) Soxhlet Apparatus              |
| 4) Semi preparative Chromatography | d) Clavenger Apparatus            |

C)

- |                       |                    |
|-----------------------|--------------------|
| 1) Spectrophotometer  | a) CNS activity    |
| 2) LAL Test           | b) Absorbance      |
| 3) Photoactometer     | c) Pyrogen Testing |
| 4) Soxhlet assembly   | d) Drug Extraction |
| 5) Friability Testing | e) Tablets         |



**KADI SARVA VISHWAVIDYALAYA  
GANDHINAGAR**

**Ph. D COURSE WORK FOR  
MANAGEMENT STUDIES  
2009-10**

## **Table of Content**

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## **Introduction:**

The course work for the doctoral research has been made mandatory by the UGC. Kadi Sarva Vishwavidyalaya has decided to implement this aspect on the immediate basis for the benefit of the students pursuing Ph.D. The course work is designed in such a way as to support, motivate and encourage quality research. By undergoing this course work, the student will get quipped with fundamentals of research methodology, scientific communication and also recent developments in the field of specialization. The course work has to be completed by the student in a satisfactory way before submission of his/her dissertation thesis.

## **Course Structure:**

Paper	Title	<b>University Examination</b> Common Syllabus for all discipline (Marks) Section A	<b>University Examination</b> Specific Syllabus for each discipline (Marks) Section B	<b>Total Marks</b>
Paper - I	Research Methodology	60	40	100
Paper - II	Scientific Communication	60	40	100
Paper -III	Specialization Paper	-----	-----	100



# **Paper – I: Research Methodology**

## **CONTENT**

1. Introduction to Educational Research
2. Quantitative, Qualitative, and Mixed Research
3. Developing Research Questions and Proposal Preparation
4. Research Ethics
5. Standardized Measurement and Assessment
6. Methods of Data Collection
7. Sampling
8. Validity of Research Results
9. Experimental Research
10. Quasi-Experimental and Single-Case Designs
11. Non-experimental Quantitative Research
12. Qualitative Research
13. Historical Research
14. Mixed Model and Mixed Method Research
15. Descriptive Statistics
16. Inferential Statistics
17. Data Analysis in Qualitative Research
18. Preparation of the Research Report

## **Reference Books: Latest Editions of following Books:-**

- 1) Kothari C R., Research Methodology (Methods and Techniques), New Age Publications
- 2) Educational Research Quantitative, Qualitative and Mixed Approaches by Burke Johnson & Larry Christensen, Sage Publications
- 3) Fundamentals of modern statistical methods by Rand R Wilcoxon
- 4) Power Analysis for Experimental Research : A Practical Guide for the Biological, Medical and Social Science by R Barker Basel, Yu-Fang Li Cambridge University Press

## MODEL QUESTION-PAPER

### Section-A (Common for all Departments)

**I: Select the right choice in the questions given below:**

**(60)**

1. Mrs. Smith is writing her daily observations of a student and writes, without interpretation, that the student is not completing the class work and is constantly speaking out of turn. Which of the following objectives does she appear to be using?
  - a. prediction
  - b. description
  - c. explanation
  - d. exploration
  
2. Which of the following is a form of research typically conducted by teachers, counselors, and other professionals to answer questions they have and to specifically help them solve local problems?
  - a. action research
  - b. basic research
  - c. predictive research
  - d. orientation research
  
3. A researcher designs an experiment to test how variables interact to influence how well children learn spelling words. In this case, the main purpose of the study was:
  - a. Explanation
  - b. Description
  - c. Influence
  - d. Prediction
  
4. There is a set of churches in the U.S. where part of the service involves snake handling. The researcher wants to find out why the people attending these churches do this and how they feel and think about it. In this case, the primary purpose of the study is:
  - a. Exploration
  - b. Description
  - c. Influence
  - d. Prediction
  
5. What is the key defining characteristic of experimental research?
  - a. extraneous variables are never present
  - b. a positive correlation usually exists
  - c. a negative correlation usually exists
  - d. manipulation of the independent variable

6. In \_\_\_\_\_, random assignment to groups is never possible and the researcher cannot manipulate the independent variable.
- basic research
  - quantitative research
  - experimental research
  - causal-comparative and correlation research
7. A researcher studies achievement by children in poorly funded elementary schools. She develops a model that posits parent involvement as an important variable. She believes that parent involvement has an impact on children by increasing their motivation to do school work. Thus, in her model, greater parent involvement leads to higher student motivation, which in turn creates higher student achievement. Student motivation is what kind of variable in this study?
- Manipulated variable
  - Extraneous variable
  - Confounding variable
  - Mediating or intervening variable
8. Why is the statement “What are the effects of extracurricular activities on cognitive development of school age children” not a good statement of a quantitative research question?
- Because there is no connection between extracurricular activities and cognitive development
  - Because there is not enough school age children engaged in extracurricular activities to Conduct the study
  - Because the study would be too difficult to do given all the different extracurricular activities
  - Because the statement was not specific enough to provide an understanding of the variables Being investigated
9. One step that is not included in planning a research study is:
- Identifying a researchable problem
  - A review of current research
  - Statement of the research question
  - Conducting a meta-analysis of the research
  - Developing a research plan
10. What kind of ideas can't be empirically researched?
- Effectiveness of different methods of instruction
  - Description of educational practices
  - Issues of values and morality such as the correctness of having prayer in schools
  - Factors helpful in predicting future drug use
11. A statement of the quantitative research question should:
- Extend the statement of purpose by specifying exactly the question(s) the researcher will Address

- b. Help the research in selecting appropriate participants, research methods, measures, and Materials
  - c. Specify the variables of interest
  - d. All of the above
12. Research hypotheses are \_\_\_\_\_.
- a. Formulated prior to a review of the literature
  - b. Statements of predicted relationships between variables
  - c. Stated such that they can be confirmed or refuted
  - d. b and c
13. Which of the following is necessary in obtaining informed consent?
- a. A description of the statistical analyses that will be carried out
  - b. A description of the purpose of the research
  - c. A description of the reliability and validity of test instruments
  - d. A list of publications that the researcher has had in the last ten years
14. Which of the following need(s) to be obtained when doing research with children?
- a. Informed consent from the parent or guardian
  - b. Assent from the child if he or she is capable
  - c. Informed consent from the child
  - d. Both a and b
15. If a baseball coach calculates batting averages, what scale would be used?
- a. Interval scale
  - b. Ratio scale
  - c. Nominal scale
  - d. Ordinal scale
16. According to the text, most of the outcome/dependent variable characteristics and attributes measured in educational research probably exist at the \_\_\_\_\_ level of measurement.
- a. Nominal
  - b. Ordinal
  - c. Interval
  - d. Ratio
17. Which of the following is most clearly an example of a psychological trait?
- a. Anxiety enduring for months or years
  - b. Anxiety over just seeing a spider
  - c. Shyness when meeting a stranger for the first time
  - d. Depression caused by the loss of a ball game
18. Which is the process of gathering evidence supporting inferences based test scores?
- a. Validation
  - b. Validity
  - c. Reliability

- d. Prediction
19. When evaluating tests and assessments, “reliability” refers to asking ourselves which of the following questions?
- Does it measure what it is supposed to measure?
  - Are there ways to avoid subjective judgments when measuring something?
  - Does it give consistent results?
  - Does it measure multiple constructs?
20. Validity of a test designed to measure a construct such as self-esteem is best described by which of the following?
- Scores from the test correlate highly with most intelligence tests
  - Scores from the test correlate highly with most tests of different constructs
  - Scores from the test are not correlated with anything
  - Scores from the test have a relatively strong and positive correlation with other tests of the same construct (i.e., with other measures of self-esteem) but much lower correlations with tests of different constructs
21. According to the text, questionnaires can address events and characteristics taking place when?
- In the past (retrospective questions)
  - In the present (current time questions)
  - In the future (prospective questions)
  - All of the above
22. Which of the following are principles of questionnaire construction?
- Consider using multiple methods when measuring abstract constructs
  - Use multiple items to measure abstract constructs
  - Avoid double-barreled questions
  - All of the above
  - Only b and c
23. Researchers use both open-ended and closed-ended questions to collect data. Which of the following statements is true?
- Open-ended questions directly provide quantitative data based on the researcher’s predetermined response categories
  - Closed-ended questions provide quantitative data in the participant’s own words
  - Open-ended questions provide qualitative data in the participant’s own words
  - Closed-ended questions directly provide qualitative data in the participants’ own words
24. Open-ended questions provide primarily \_\_\_\_\_ data.
- Confirmatory data
  - Qualitative data
  - Predictive data
  - None of the above
25. A question during an interview such as “Why do you feel that way?” is known as a:
- Probe
  - Filter question
  - Response

d. Pilot

26. When conducting an interview, asking "Anything else?, What do you mean?, Why do you feel that way?," etc, are all forms of:
- Contingency questions
  - Probes
  - Protocols
  - Response categories
27. When constructing a questionnaire, there are 15 principles to which you should adhere. Which of the following is not one of those principles?
- Do not use "leading" or "loaded" questions
  - Avoid double-barreled questions
  - Avoid double negatives
  - Avoid using multiple items to measure a single construct
28. Which of the following techniques yields a simple random sample?
- Choosing volunteers from an introductory psychology class to participate
  - Listing the individuals by ethnic group and choosing a proportion from within each ethnic group at random.
  - Numbering all the elements of a sampling frame and then using a random number table to pick cases from the table.
  - Randomly selecting schools, and then sampling everyone within the school.
29. Which of the following will give a more "accurate" representation of the population from which a sample has been taken?
- A large sample based on the convenience sampling technique
  - A small sample based on simple random sampling
  - A large sample based on simple random sampling
  - A small cluster sample
30. Sampling in qualitative research is similar to which type of sampling in quantitative research?
- Simple random sampling
  - Systematic sampling
  - Quota sampling
  - Purposive sampling
31. Which of the following would generally require the largest sample size?
- Cluster sampling
  - Simple random sampling
  - Systematic sampling
  - Proportional stratified sampling
32. If we took the 500 people attending a school in New York City, divided them by gender, and then took a random sample of the males and a random sampling of the females, the variable on which we would divide the population is called the \_\_\_\_\_.

- a. Independent a variable
  - b. Dependent variable
  - c. Stratification variable
  - d. Sampling variable
33. The nonrandom sampling type that involves selecting a convenience sample from a population with a specific set of characteristics for your research study is called \_\_\_\_\_.
- a. Convenience sampling
  - b. Quota sampling
  - c. Purposive sampling
  - d. Snowball sampling
34. The number of police officers and the number of crimes are positively related. This relationship is:
- a. A causal relationship
  - b. A direct relationship
  - c. A probabilistic causal relation
  - d. A spurious relationship
35. A research studies the relation between early reading and later school achievement. She decides that a potentially extraneous variable in the relationship is IQ. In developing her groups for her study, she pairs each child who was an early reader with a child of the same IQ level who was not an early reader. The control technique she used was:
- a. Holding the extraneous variable constant
  - b. Statistical control
  - c. Matching
  - d. Random assignment
36. \_\_\_\_\_ is a form of explanatory research in which the researcher develops a theoretical model and empirically tests the model to determine how well the model fits the data.
- a. Causal modeling
  - b. Predictive research
  - c. Descriptive research
  - d. Exploratory research
37. This type of research tests hypotheses and theories in order to explain how and why a phenomenon operates as it does.
- a. Descriptive research
  - b. Predictive research
  - c. Explanatory research
  - d. None of the above
38. The Pearson product moment correlation measures the degree of \_\_\_\_\_ relationship present between two variables.
- a. Curvilinear
  - b. Nonlinear
  - c. Linear and quadratic

d. Linear

39. You want to study a Native American group in New Mexico for a six month period to learn all you can about them so you can write a book about that particular tribe. You want the book to be accurate and authentic as well as informative and inspiring. What type of research will you likely be conducting when you get to New Mexico?
- Ethnography
  - Phenomenology
  - Grounded theory
  - Collective case study
40. A researcher studying the history of medical education finds a manuscript that purports to be from the 14<sup>th</sup> century. Before he uses the source, he goes to three other experts who help him identify whether the manuscript is authentic or not. His authentication of the object is referred to as:
- Positive criticism
  - Internal criticism
  - Secondary criticism
  - External criticism
41. A historical researcher studying the implementation of the “new math” during the 1960s uses as a source a text written on the subject by a critic who was a mathematics teacher during that time period. As she examines the document, she discovers that the data that the individual based his or her conclusions on was falsified. Hence, the conclusions drawn were erroneous. Her analysis of the document to check its accuracy is referred to as:
- Positive criticism
  - Internal criticism
  - External criticism
  - Secondary criticism
42. A researcher is interested in studying approaches to teaching writing in schools during the 1800s. She discovers a grammar book, but there is no author or copyright date in the book. She examines the typeface in the book as well as the writing style. After investigating further, she finds a reference to the book from a teacher’s diary from the 1800s. The diary also mentions an author’s name. After further searching around she is able to identify the author of the book. The investigator was engaged in what process
- Sourcing
  - Positive criticism
  - Presentism
  - Axial coding
43. Approximately what percentage of scores fall within one standard deviation of the mean in a normal distribution?
- 34%
  - 95%
  - 99%



d. 68%

44. The denominator (bottom) of the z-score formula is
- The standard deviation
  - The difference between a score and the mean
  - The range
  - The mean
45. Focusing on describing or explaining data versus going beyond immediate data and making inferences is the difference between \_\_\_\_\_.
- Central tendency and common tendency
  - Mutually exclusive and mutually exhaustive properties
  - Descriptive and inferential
  - Positive skew and negative skew
46. Why are variance and standard deviation the most popular measures of variability?
- They are the most stable and are foundations for more advanced statistical analysis
  - They are the most simple to calculate with large data sets
  - They provide nominally scaled data
  - None of the above
47. \_\_\_\_\_ is the set of procedures used to explain or predict the values of a dependent variable based on the values of one or more independent variables.
- Regression analysis
  - Regression coefficient
  - Regression equation
  - Regression line
48. If a test was generally very easy, except for a few students who had very low scores, then the distribution of scores would be \_\_\_\_\_.
- Positively skewed
  - Negatively skewed
  - Not skewed at all
  - Normal
49. What does it mean when you calculate a 95% confidence interval?
- The process you used will capture the true parameter 95% of the time in the long run
  - You can be “95% confident” that your interval will include the population parameter
  - You can be “5% confident” that your interval will not include the population parameter
  - All of the above statements are true
50. What would happen (other things equal) to a confidence interval if you calculated a 99 percent confidence interval rather than a 95 percent confidence interval?
- It will be narrower
  - It will not change

- c. The sample size will increase
- d. It will become wider

51. Which of the following statements sounds like a null hypothesis?

- a. The coin is not fair
- b. There is a correlation in the population
- c. There is no difference between male and female incomes in the population
- d. The defendant is guilty

52. Which \_\_\_\_ percent confidence interval will be the widest (i.e., the least precise) for a particular data set that includes exactly 500 cases?

- a. 99%
- b. 95%
- c. 90%
- d. None of the above

53. As sample size goes up, what tends to happen to 95% confidence intervals?

- a. They become more precise
- b. They become more narrow
- c. They become wider
- d. Both a and b

54. \_\_\_\_\_ is the failure to reject a false null hypothesis.

- a. Type I error
- b. Type II error
- c. Type A error
- d. Type B error

55. Which of the following is not true about the use of language in research reports?

- a. You should choose accurate and clear words that are free from bias.
- b. You should avoid labeling people whenever possible
- c. You should avoid using the term “subjects” whenever possible
- d. All of the above are true according to the APA Guidelines

56. When referencing other works you have cited within the text of the report you should

- a. State the first and last name of the author
- b. Use the author, date citation method
- c. Use an asterisk and a footnote
- d. Insert the complete citation in parenthesis

57. Which of the following abbreviations can be used in a research report?

- a. IQ
- b. sec. for second
- c. yr. for year
- d. mo. for month

58. Editorial style specifies that \_\_\_\_\_ should be used infrequently or sparingly.
- Italics
  - Abbreviations
  - Headings
  - Both a and b
59. A researcher is doing a study of peer groups in middle school. She interviews 5 girls and 5 boys. She is doing a grounded theory study; hence, she decides to generate her codes as she scans through her transcriptions of her data. These codes are labeled:
- A priori codes
  - Post hoc codes
  - Inductive codes
  - Master list codes
60. Sarah is a qualitative researcher studying how children and parents interact in Head Start Centers. As she examines her data (videotapes and transcripts), she jots down notes concerning the interactions, generating hypotheses, suggesting relationships among categories of information she is examining and so on. This process of jotting notes as she examines the data is called:
- Memoing
  - Transcription
  - Facesheet coding
  - Drawing diagrams

## **Section-B ( For Management Ph D Students )**

**II: Answer the following questions in brief:**

**(40)**

- Discuss Exploration type of research with its advantages.
- Explain in brief, research paradigm, based on pragmatic view of reality.
- Discuss importance of qualitative research questions with examples.
- Discuss the use of research ethics.
- Explain the concept of systematic error, related to research
- Identify the difference between filter question and probe with examples.
- Compare Convenience sampling with Judgement sampling.
- Differentiate between cluster sampling and stratified sampling.
- Explain concept of internal validity, with its application in research
- What is importance of covariance in research ?
- Discuss the concept of partial correlation analysis with examples.
- Explain predictive type of research.
- Explain characteristics of qualitative research in brief.
- Explain concept of internal criticism and compare with external criticism.
- Explain the demerits of mixed type of research.

# **Paper-II Scientific Communication**

## **COURSE CONTENT**

### **Section-A (Common for all Departments)**

1. Basic of Communication skill.
2. English Grammar
  - a) Word Choice, sentence Structure, paragraph structure
3. Types of Scientific Communication.
4. Importance of publishing research paper.
5. Publishing paper:
  - a) Preliminaries, Format ,Choosing Journal
  - b) Title, Running Title
  - c) Authors: Single and Multi authorship
  - d) Writing Abstract
  - e) Selecting Keywords
  - f) Introduction section
  - g) Materials and Methods Section
  - h) Result Section
  - i) Figures: Design Principles, Legends, Table components, Graphs: Types, style, Tables v/s Graph
  - j) Discussion Section: Format, Grammar Style, Content.
  - k) Acknowledgements
  - l) References : Different Styles
  - m) Communication with the Editor, Handling Referees' Comments. Galey Proofs
6. Writing Review Articles
7. Preparing Posters for Scientific Presentation
8. Preparing and Delivering of Oral Presentation
9. Writing Practical Reports.
10. Avoiding Plagiarism
11. Research Grant funding Agencies, Preparing for application to grant providing Agencies
12. Patent drafting and submission
13. IUPAC symbols and Terminology for physicochemical quantities and units, SI prefixes, Fundamental Constants, Standard Abbreviations and Symbols
14. Preparing documents for Technology Transfers, MoUs, Confidentiality Agreements

### **Reference Books:**

- 1) Study and Communication Skills for the Biosciences by Stuart Johnson and Jon Scott, Oxford University Press.
- 2) Write and Publish a Scientific Paper by Robert A. Day Oryx Press
- 3) Scientific Easy when you know how by Jennifer Peat BMJ Books
- 4) Research Projects and Research Proposals A Guide for Scientists Seeking funding by Paul G Chapin Cambridge University Press.

## **SECTION-B (FOR FACULTY OF MANAGEMENT STUDIES)**

Assignments on following should be provided by the guide to the student which will be evaluated by two internal examiners appointed by the Dean, Assignments should include all the components mentioned below:

- a) Exercises on writing research papers, preparing project proposals for any of the funding agencies and preparing a power point presentation for the made proposal.
- b) Critical analysis of at least 10 research papers of interest published in refereed journals with respect to language, content, title, reference style, data, figures, tables, discussion etc. and preparing a report on the same.
- C) Writing and submitting a review article related to doctoral research topic for an international journal.

# **Paper –III Specialization Paper Course**

## **COURSE OUTLINE: MARKETNG RESEARCH SCHOLARS**

### **Section-A**

#### **PART 1 : UNDERSTANDING MARKETING MANAGEMENT**

Defining Marketing for the 21<sup>st</sup> Century

Developing Marketing Strategies and Plans

#### **PART 2 : CAPURING MARKETNG INSIGHTS**

Gathering Information and Scanning the Environment

Conducting Marketing Research and Forecasting Demand

#### **PART 3 : CONNECTING WITH CUSTOMERS**

Creating Customer Value, Satisfaction, and Loyalty

Analyzing Consumer Market

Analyzing Business Market

Identifying Market Segments and Targets

#### **PART 4 : BUILDING STRONG BRANDS**

Creating Brand Equity

Crafting the Brand Positioning

Dealing with Competition

#### **PART 5 : SHAPING THE MARKET OFFERINGS**

Setting product Strategy

Designing and Managing Services

Developing Pricing Strategies and Programs

#### **PART 6 : DELIVERING VALUE**

Designing and Managing Integrated Marketing Channels

Managing Retailing , Wholesaling , and Logistics

#### **PART 7: COMMUNICATING VALUE**

Designing and Managing Integrated Marketing Communications

Managing Mass Communications: Advertising, Sales Promotions, Events, and Public Relations

Managing Personal Communications: Direct and Interactive Marketing and Personal Selling

#### **PART 8 : CREATING SUCCESSFUL LONG TERM GROWTH**

Chapter 20: Introducing New Market Offerings

Chapter 21: Tapping into Global Markets

Chapter 22 : Managing Holistic Marketing Organization

#### **Text books:**

- Marketing Management – Kotler, Keller, Koshi & Jha, PHI.
- Marketing Management – Evan & Berman, Cengage Publication.

## MODEL QUESTION-PAPER

### Section –A

**I: Select the right choice in the questions given below: (60)**

1. Researchers at PPG industries spent considerable time, effort, and money developing bluish windshield that would let in filtered sunlight but block out the heat. Little market research was done. But the scientists were convinced this new product would be significantly better than existing windshields even though they were more expensive and of a different color than the current models on the market. This scenario suggests PPG most likely has a(n)\_\_\_\_\_ orientation
  - a. exchange
  - b. production
  - c. sales
  - d. promotion
  - e. customer
2. Frito –Lay defines its business as “snack-food” rather than just “corn chips”. This is an example of:
  - a. a marketing mix strategy.
  - b. a mission statement.
  - c. quantifiable goals.
  - d. a financial statement.
  - e. organizational accomplishment
3. GlaxoSmithKline PLC, the world’s biggest maker of HIV drugs, is accused in an antitrust lawsuit of preventing generic competition to its drugs. In terms of its situation analysis, this would be termed a threat for the pharmaceutical company.
  - a. True
  - b. False
4. Generation Y members are the most sophisticated generation ever when it comes to media.
  - a. True
  - b. False
5. The same Kellogg’s corn flakes you buy in U.S. supermarket can be purchased in supermarkets in Europe. This is an example of global brand extension.
  - a. True
  - b. False

6. Globalization holds many benefits to many different countries .Which of the following is NOT a likely benefit of globalization?
- It raises productivity and living standards for people in developing countries.
  - It helps labor unions in production-oriented businesses in industrialized countries.
  - It provides needed technology to developing countries
  - It encourages free trade.
  - It provides developed countries access to additional resources.
7. Roland tends to buy the same brands of mouthwash and toilet paper as his \_\_\_\_\_, which is often the strongest source of group influence upon the individual for many product purchases.
- family
  - social class
  - girlfriend
  - subculture
  - fraternity brothers
8. A minor league baseball (MiLB) marketer, who wanted to reduce the likelihood that people attending games played by her team would switch to another sport or source of entertainment might:
- create a feeling of post-purchase anxiety for fans purchasing MiLB tickets.
  - Offer incentives to get baseball fans to repeatedly purchase tickets for its games until they do it out of habit
  - Increase the social visibility of baseball
  - Raise the price of game tickets relative to the price of similar events to reduce the level of consumer involvement.
  - Switch ticket distribution to different outlets
9. The manager of Dalton Carpets has access to a list of potential customers through the North American Industry Classification System (NAICS). He would know more about potential customers if he concentrates on the first two digits in the classification system and ignores the last two digits.
- True
  - False
10. Larry O’Hair sells hospital supplies and has had the most success speaking to nurses about his products. The nurses often tell him that will recommend his products to the purchasing department. Which role in the buying center do the nurses have?
- gatekeeper
  - influencer
  - purchaser
  - decider
  - buyers
11. Which of the following is NOT a typical market characteristic?



- a. willingness to buy the product
  - b. ability to buy the product
  - c. are aware of the product
  - d. a group of people or organizations
  - e. has needs or wants
12. Soon after the Harriet Tubman Museum expanded its hours and began charging a small fee to pay for the extra help needed to keep it open longer hours, attendance decreased. To determine why this decrease in attendance occurred, the museum staff could rely on.
- a. a production audit
  - b. database marketing
  - c. marketing research
  - d. an internal marketing audit
  - e. secondary data
13. The sales manager periodically asks his salespeople to create a report on what they have observed the competition doing in the marketplace, what they suspect the competition may do, and how their buyers are reacting to the competition's strategies. The sales manager is conducting competitive espionage.
- a. True
  - b. False
14. You walk into an electronics store to purchase a computer. Even before you purchase, you are pleased with the service of the store's sales associates, who seem knowledgeable and helpful. The service provided by the sales associates can be judged through the use of \_\_\_\_\_ qualities.
- a. credence
  - b. internal marketing
  - c. experience
  - d. search
  - e. reliability
15. The label on a jug of milk says the product is fat-free. This label would be an example of an express warranty.
- a. True
  - b. False
16. Pepsi-Cola is a brand that is over 100 years old and has launched a series of line extensions. Despite its age, it still maintains a large market share. Pepsi is in the maturity stage of its life cycle.
- a. True
  - b. False
17. Jeremy is self-confident, well-educated, active outside of his community, and always eager to try new products. Jeremy would be considered an early majority adopter.

- a. True
  - b. False
18. The growers of Vidalia onions have determined that their chief priority for choosing a transportation mode within the United States is transit time. However, this must be emerged by practical cost considerations. In light of these considerations, Vidalia onion growers should use \_\_\_\_\_ to ship their onions
- a) railroads
  - b) motor carriers
  - c) airplanes
  - d) water transportation
  - e) pipelines
19. Nancy Gordan orders office supplies from a local retailer through her computer. The computer program is set up to transmit purchase orders and invoices between customers and the retailer. The retailer then delivers the products to her office. This is an example of electronic distribution
- a. True
  - b. False
20. Chain stores are owned and operated by a single organization.
- a. True
  - b. False
21. Strata is a retailing operation that sells on the internet. It carries everything from jewelry to telescopes to cosmetics. The company states its products “enhance and inspire the appreciation and preservation of nature and world cultures”. From this statement, you can infer that Strata uses
- a. the wheel of retailing
  - b. very narrow product depth
  - c. scrambled merchandising
  - d. an expanded inventory
  - e. an aggregated retailing mix
22. In the advertisement for Dow bathroom cleaner, animated, talkative scrubbing bubbles are used to show how hard the bubbles work to clean. The lively scrubbing bubbles appear in all advertisements for this product and are depicted on the packaging. This is an example of a \_\_\_\_\_ executional style.
- a. fantasy
  - b. lifestyle
  - c. spokesperson
  - d. product symbol
  - e. scientific evidence
23. Sales promotion is typically more expensive and more difficult to measure than advertising.

- a. True
  - b. False
24. New York City-based Unilever encouraged retailers to buy display units of soap products by offering them \$100 gift certificates for each unit they purchased. The \_\_\_\_\_ helped drive a \$1.2 million dollar increase in net dollar sales of bar soaps for the quarter in which the promotion was used:
- a. premium
  - b. point-of-purchase discount
  - c. merchandise bonus
  - d. trade allowance
  - e. push money
25. The U.S department of Justice charged Samsung, Hynix Semiconductor Inc, Infineon computer memory between 1999 and 2002. This means the companies engaged in price discrimination.
- a. True
  - b. False
26. Which of the following is NOT a feature of a good strategic marketing plan?
- a. A process for formulating strategies
  - b. A large marketing budget
  - c. A means of monitoring performance
  - d. A process in which different functional areas coordinate efforts
27. Which of the following is NOT part of a total quality program?
- a. Customer satisfaction
  - b. Continuous improvement
  - c. Low costs
  - d. Customer focus
28. Marketing plans can be categorized by
- a. objective, size, and orientation.
  - b. cost, function, and level in organization.
  - c. cost, size, and degree of organizational commitment.
  - d. duration, scope, and method of development.
29. Which statement concerning the value chain is NOT correct?
- a. There are two components of the value chain: the value chain itself and the value delivery chain.
  - b. The parties in a value chain typically have common goals.
  - c. Order fulfillment, quality control, and product commercialization are examples of value chain activities.
  - d. A value chain represents the series of business activities that are performed to design, produce, market, deliver, and service a product.
30. The sorting process enables

- a. small firms to purchase large quantities of goods.
- b. the conflicting goals of manufacturers and consumers to be resolved.
- c. small firms to receive high levels of customer service.
- d. channel members to be viewed as strategic partners.

31. With an administered channel arrangement,
- a. all the terms regarding distribution functions, prices, and other factors are clearly specified in writing. Process
  - b. the dominant firm in the distribution plans the marketing program and itemizes and
  - c. coordinates each member's duties.
  - d. all of the channel members are owned and controlled by the manufacturer.
  - e. the channel of distribution is direct.
32. A firm that is oriented toward high sales volume or high market share should seek \_\_\_\_-based pricing objectives.
- a. status quo
  - b. broad
  - c. profit
  - d. sales
33. Penetration pricing is best used with which pricing objective?
- a. Status quo-based
  - b. Sales-based
  - c. Broad-based
  - d. Profit-based
34. A wholesaler wanting to minimize the impact of a discounter selling gray market goods should use \_\_\_\_-based pricing objectives.
- a. profit
  - b. status quo
  - c. sales
  - d. return-on-investment
35. What is the role of price in an open marketplace?
- a. It reflects payment for tangible marketing factors.
  - b. It increases if there is an excess of supply over demand.
  - c. It decreases if there is an excess of demand over supply.
  - d. It allocates goods and services among potential buyers.
36. When there are product shortages due to too low a supply, an equilibrium point will be reached if
- a. consumer demand further expands.
  - b. consumers bid up prices.
  - c. sellers reduce prices.
  - d. competitors leave the market.
37. The 16 million people identified as working in personal selling by the Department of Labor does not include a "hidden selling sector." The "hidden selling sector" is made up of
- a. wholesale sales employees.

- b. retail sales employees.
  - c. telemarketers.
  - d. individuals whose jobs entail a high degree of personal interaction with customers, but who are not classified as salespeople.
38. A two-way flow of communication between a buyer and a seller is referred to as the
- a. interactive approach.
  - b. Multi step flow.
  - c. communication process.
  - d. buyer-seller dyad.
39. The highest audience waste in personal selling occurs with
- a. selling to former customers.
  - b. direct selling.
  - c. selling to major accounts.
  - d. selling to potential customers classified by the same NAICS code as current customers.
40. Which of these is NOT a major advantage of personal selling as compared with advertising?
- a. Personal selling has less waste than advertising.
  - b. Personal selling is less costly than advertising on a per prospect reached basis.
  - c. Personal selling centers on a more defined and concentrated target market.
  - d. Those who walk into a store or who are contacted by personal selling are more likely to purchase a product than those who have watched a commercial.
41. Social responsibility is most correctly defined as
- a. a concern for the consequences of a person's or firm's acts as they might affect the interests of others.
  - b. a marketing practice that capitalizes on short-run material wearout, style changes, and functional product changes.
  - c. behavior based upon honest and proper conduct.
  - d. the activities of government, business, and independent organizations that are designed to protect people from practices that infringe on their rights as consumers.
42. Which concept is concerned with the impact of production and product consumption from a product's conception to its ultimate disposal?
- a. Planned obsolescence
  - b. The socioecological view of marketing
  - c. Process-related ethical issues
  - d. Product-related ethical issues
43. BMW's "design for disassembly" (DFD) auto that facilitates the proper recycling of steel and aluminum best illustrates which social responsibility concept?
- a. Process-related ethical issues
  - b. Secondary consumers
  - c. Planned obsolescence
  - d. The socioecological view of marketing
44. The depletion of crude oil resources can be most effectively lowered by encouraging
- a. car manufacturers to post mileage ratings on all new cars.

- b. car owners to drive at slightly above the speed limit.
  - c. consumers to purchase U.S.-produced cars.
  - d. car pooling and allowing car pools with three or more passengers access to special traffic lanes on congested highways.
45. Which of the following is an example of material planned obsolescence?
- a. The popularity of small microwave ovens for use in dorm rooms
  - b. A new model camcorder that is one-third the weight of a previous model
  - c. A disposable razor designed specifically for business people who travel and for tourists
  - d. Same-color ties and shirts that are being heavily promoted in men's clothing magazines
46. Which types of products have been heavily criticized by environmentalists due to material planned obsolescence?
- a. Cigarettes
  - b. Disposables
  - c. Linen clothing
  - d. SUVs
47. Which of these activities is NOT considered part of retailing?
- a. The sale of a car to a final consumer by a direct importer
  - b. The sale of a car to a corporation for use by top executives
  - c. The sale of a car to a final consumer by a retail car dealer
  - d. The leasing of a car to a final consumer by a leasing agency
48. On average, department and specialty stores receive \_\_\_\_ cents of every sales dollar for the functions they perform.
- a. 20-25
  - b. 25-30
  - c. 30-35
  - d. over 50
49. On average, supermarkets receive \_\_\_\_ cents of every sales dollar for the functions they perform.
- a. 8
  - b. 15
  - c. 25
  - d. 40
50. A significant difficulty in adding up corresponding retail sales figures for different types of retailers is that
- a. figures come from different sources.
  - b. figures may correspond to different fiscal years.
  - c. retail categories may overlap.
  - d. each source can define a retailer differently.
51. High failure rates, inadequate resources, and the highest degree of competition characterize which retail organizational format?
- a. Chains

- b. Independents
  - c. Franchises
  - d. Leased departments
52. In retail franchising, the franchisor usually receives payments in the form of
- a. franchise fees and royalties.
  - b. fees for specific consulting services.
  - c. rental agreements.
  - d. maintenance agreements.
53. A set business format, the use of an established name, strict operating controls, and motivated owner-operators are major characteristics of which form of retail institution?
- a. Independent retailer
  - b. Retail chain
  - c. Franchise
  - d. Category killer
54. Which of these reflects the major consumer appeal of a conventional supermarket?
- a. Fill-in merchandise
  - b. Delivery services
  - c. One-stop grocery shopping
  - d. A deep selection within a merchandise category
55. Which of these reflects the major consumer appeal of a conventional supermarket?
- a. Fill-in merchandise
  - b. Delivery services
  - c. One-stop grocery shopping
  - d. A deep selection within a merchandise category
56. An extended fad product life-cycle pattern is characterized by
- a. a sharp decline in sales after a product's introduction.
  - b. high seasonal sales or a high fashion component.
  - c. residual sales that continue at a lower level than earlier sales.
  - d. a product that maintains sales over a long time period.
57. The decline stage of the product life cycle is characterized by the
- a. development and sale of substitutes for a product.
  - b. highest level of product competition.
  - c. beginning of discounting by a firm and its competitors.
  - d. expansion of distribution.
58. With a self-fulfilling prophecy, a firm incorrectly
- a. seeks out the largest, but most competitive market segment.
  - b. assesses its ability to reverse a downward sales pattern.
  - c. removes marketing support from a product that requires additional support to grow.
  - d. seeks out an incorrect international market.
59. Which of the following is NOT a major reason for the importance of new products to a company?
- a. New products can utilize waste materials and byproducts of existing products.
  - b. New products are generally necessary to maintain a balanced portfolio.

- c. New products can reduce a firm's total investment requirements.
  - d. New products can help maximize the efficiency of a firm's distribution system.
60. Absolute product failure occurs when a firm
- a. is unable to regain its production and marketing costs.
  - b. does not meet its sales and/or profit expectations.
  - c. withdraws a product prior to commercialization.
  - d. withdraws a product after test marketing.
61. Manufacturers'/service providers' agents sell only noncompetitive products to
- a. spread the risks of providing trade credit to smaller customers.
  - b. provide ample customer service to both small and large customers.
  - c. avoid a conflict of interest among their manufacturers/service providers.
  - d. handle smaller territories.

## **Section B**

**Answer in brief:**

**(40)**

1. Explain the statement "Advertising is paid for, publicity is prayed for."
  2. How does the use of consumer demographics aid marketing decision making?
  3. Under what circumstances should a manufacturer or service provider undertake wholesaling?
  4. What are the unique features of cash-and-carry and truck/wagon merchant wholesalers?
  5. State three ways for a firm to evaluate the success or failure of its public relations efforts.
  6. Explain why so many marketers give only "lip" service to "customer service."
  7. Under what circumstances should a company consider reappraising its organizational mission?
  8. Describe the Boston Consulting Group Matrix and the Porter generic strategy model.
  9. Outline the steps in the selling process.
  10. As a telemarketer, how would you deal with the new Do Not Call Registry?
  11. How can a service be positioned more tangibly?
  12. What are some of the similarities and differences involved in the marketing efforts used by nonprofit and profit-oriented organizations?
  13. Draw and discuss a service blueprint for an insurance broker dealing with life insurance for people ages 50 and over.
  14. Describe the pros and cons of planned obsolescence as a marketing practice.
  15. Why are ethical standards of conduct particularly complex for international marketers?
-



# **FINANCE RESEARCH SCHOLARS**

## **COURSE OUTLINE**

### **1. FINANCIAL THEORY**

1. Introduction to Capital Market, Consumption and Investment: Primary Market , secondary market, Merchant Banking , mutual fund.
2. Efficient Capital Markets: Theory
3. Efficient Capital Market: Evidence.
4. Investment Decisions: NPV, IRR, PI, Payback Period
5. Theory of choice Under Uncertainty: Utility Theory
6. Market Equilibrium: CAPM and APT
7. Pricing Contingent Claims: options – call , put option, trading in India.
8. Futures Contracts and Market –
9. Multi Period Accepts of Financial Theory – Real Options – Investment. Types of real option.
10. Information Asymmetry: Agency Cost Theory and Signaling.

### **2. CORPORATE POLICY**

11. The Role of the CFO and Performance Measurement: Agency Problem
12. Valuation and Tax Policy.
13. Capital Structure. NI approach, NOI approach, traditional approach, pecking order, Signaling, MM approaches
14. Dividend Policy: Walter model, Gordon Model, MM approach, stock split, buyback of shares.
15. External Investment Decisions. ECB, FCCB
16. International Finance: Theory and Evidence: foreign exchange market, risk and hedging .

### **Reference Books:**

Financial Management by Prasanna Chandra , TMH  
Financial Management by I M Pandey , vikas publishing house  
Merchant Banking and Financial Services by Dr. Ss. Guruswamy, Latest Edition, TMH  
Principles of Corporate Finance, Latest Edition, By Megginson, Smart, & Gitman.,  
Cengage Learning. (India Edition), South - Western  
International Financial Management-J. Madura-latest edition. South Western Publications

## **MODEL QUESTION-PAPER**

### Section –A

**I:Select the right choice in the questions given below: (60)**

1. All large publicly owned corporations are “c Corporations”, and they must pay corporate income taxes. Their after tax income is taxed again when it is passed on to investors in the form of dividends, and this is called “double taxation “ However double taxation can be avoided provided a firm is small enough and has 75 or fewer stockholders, as it can then qualify as an S Corporation. As a result, most small corporations are S rather than C Corporation. True or False?
  - a. True
  - b. False
  
2. Which of the following is NOT a financial institution?
  - a. Investment bank
  - b. Commercial bank
  - c. Mutual Fund
  - d. Hedge fund
  - e. All of these choices are examples of financial Institutions.
  
- 3."Shareholder wealth" in a firm is represented by:
  - a.the number of people employed in the firm.
  - b.the book value of the firm's assets less the book value of its liabilities
  - c.the amount of salary paid to its employees.
  - d.the market price per share of the firm's common stock.
  
- 4.. The long-run objective of financial management is to:
  - a.maximize earnings per share.
  - b.maximize the value of the firm's common stock.
  - c.maximize return on investment.
  - d.maximize market share.
  
5. What are the earnings per share (EPS) for a company that earned \$100,000 last year in after-tax profits, has 200,000 common shares outstanding and \$1.2 million in retained earning at the year end?

- a. 100,000
- b. 6.00
- c. 0.50
- d. 6.50

6. A(n) \_\_\_\_\_ would be an example of a *principal*, while a(n) \_\_\_\_\_ would be an example of an *agent*.
- a. shareholder; manager
  - b. manager; owner
  - c. accountant; bondholder
  - d. shareholder; bondholder
7. The market price of a share of common stock is determined by:
- a. the board of directors of the firm.
  - b. the stock exchange on which the stock is listed.
  - c. the president of the company.
  - d. individuals buying and selling the stock.
8. The focal point of financial management in a firm is:
- a. the number and types of products or services provided by the firm.
  - b. the minimization of the amount of taxes paid by the firm.
  - c. the creation of value for shareholders.
  - d. the dollars profits earned by the firm.
9. Money market mutual funds
- a. enable individuals and small businesses to invest indirectly in money-market instruments.
  - b. are available only to high net-worth individuals
  - c. are involved in acquiring and placing mortgages
  - d. are also known as finance companies
10. The purpose of financial markets is to:
- a. increase the price of common stocks.
  - b. lower the yield on bonds.
  - c. allocate savings efficiently.
  - d. control inflation
11. Which of the following is NOT an example of a financial intermediary?
- a. International Business Machines, Inc. (IBM).
  - b. Vanguard Mutual Fund
  - c. El Dorado Savings and Loan Association
  - d. Bank of America.

12. How are funds allocated efficiently in a market economy?
- The most powerful economic unit receives the funds.
  - The economic unit that is willing to pay the highest expected return receives the funds.
  - the economic unit that considers itself most in need of funds receives them
  - Receipt of the funds is rotated so that each economic unit can receive them in turn.
13. The term "capital structure" refers to:
- long-term debt, preferred stock, and common stock equity.
  - current assets and current liabilities.
  - total assets minus liabilities.
  - shareholders' equity.
14. A critical assumption of the net operating income (NOI) approach to valuation is:
- that debt and equity levels remain unchanged.
  - that dividends increase at a constant rate.
  - that  $k_0$  remains constant regardless of changes in leverage.
  - that interest expense and taxes are included in the calculation.
15. The traditional approach towards the valuation of a company assumes:
- that the overall capitalization rate holds constant with changes in financial leverage.
  - that there is an optimum capital structure.
  - that total risk is not altered by changes in the capital structure
  - that markets are perfect.
16. Two firms that are virtually identical except for their capital structure are selling in the market at different values. According to M&M
- one will be at greater risk of bankruptcy
  - the firm with greater financial leverage will have the higher value.
  - this proves that markets cannot be efficient.
  - this will not continue because arbitrage will eventually cause the firms to sell at the same value
17. According to the concept of financial *signaling*, management behavior results in new debt issues being regarded as "\_\_\_\_ news" by investors.
- good
  - bad
  - non-event
  - risk-neutral

18. The cost of capital for a firm -- when we allow for taxes, bankruptcy, and agency costs
- remains constant with increasing levels of financial leverage.
  - first declines and then ultimately rises with increasing levels of financial leverage
  - increases with increasing levels of financial leverage
  - decreases with increasing levels of financial leverage
19. A profitability index of .85 for a project means that:
- the present value of benefits is 85% greater than the project's costs
  - the project returns 85 cents in present value for each current dollar invested e project's
  - NPV is greater than zero.
  - the payback period is less than one year
20. Which of the following statements is correct?
- If the NPV of a project is greater than 0, its PI will equal 0
  - If the IRR of a project is 0%, its NPV, using a discount rate,  $k$ , greater than 0, will be 0
  - If the PI of a project is less than 1, its NPV should be less than 0
  - If the IRR of a project is greater than the discount rate,  $k$ , its PI will be less than 1 and its NPV will be greater than 0
21. A project's *profitability index* is equal to the ratio of the \_\_\_\_ of a project's future cash flows to the project's \_\_\_\_.
- present value; initial cash outlay
  - net present value; initial cash outlay
  - present value; depreciable basis
  - net present value; depreciable basis
21. A *preliminary prospectus* is known as a
- golden parachute.
  - red herring
  - blue sky
  - green shoe
22. When the investment banker bears the risk of not being able to sell a new security at the established price, this is known as:
- best efforts offering
  - underwriting
  - shelf registration.
  - making a market
23. To say that there is "asymmetric information" in the issuing of common stock or debt means that

- a. investors have nearly perfect information
  - b. the markets have nearly perfect information.
  - c. investors have more accurate information than management has
  - d. management has more accurate information than investors have
25. *Financial intermediaries* \_\_\_\_\_ .
- a. do not invest in new long-term securities
  - b. include insurance companies and pension funds
  - c. include the national and regional stock exchanges
  - d. are usually underwriting syndicates
26. Which of the following is a legitimate reason for international investment?
- a. Dividends from a foreign subsidiary are tax exempt in the United States
  - b. Most governments do not tax foreign corporations
  - c. There are possible benefits from international diversification
  - d. International investments have less political risk than domestic investments
27. Interest-rate parity refers to the concept that, where market imperfections are few,
- a. the same goods must sell for the same price across countries
  - b. interest rates across countries will eventually be the same
  - c. there is an offsetting relationship between interest rate differentials and differentials
  - d. there is an offsetting relationship provided by costs and revenues in similar market environments.
28. Which of the following statements is true?
- a. pound interest means that interest in future periods is earned on the interest earned in the past, whereas under simple interest,
  - b. interest is earned only on the original investment. A deposit will grow faster if simple interest rather than compound
  - c. interest is paid It would be better to both lend and borrow money at a rate of 6%
  - d. simple interest, rather than at a rate of 6% compound interest
29. All of the following are hedges against exchange-rate risk EXCEPT
- a. balancing monetary assets and liabilities.
  - b. use of spot market.
  - c. foreign-currency swaps.
  - d. adjustment of funds commitments between countries.
30. Which of the following factors could lead to a NPV vs. IRR conflict between two mutually exclusive projects?
- a. Differences in the projects sizes.
  - b. Differences in the timing of the projects' cash flows
  - c. Both options are true
31. Pro forma financial statements cannot be used to examine the effects of alternative

strategies and operating plans. True or false?

- a. True
- b. False

- .
32. Preferred stockholders have a prior claim on the assets of the firm as compared to the claims of the lenders
- a. True
  - b. False
33. If you were a common shareholder with minority interests, you would prefer a majority-rule rather than a cumulative voting system
- a. True
  - b. False
34. Financial planning should be done within the context of a well-articulated strategic plan. True 'or' false?
- a. True
  - b. False
35. Risk management involves the management of predictable events that have adverse Consequences for the firm .True or false?
- a. True
  - b. False
36. An "aggressive" common stock would have a "beta"
- a. equal to zero.
  - b. greater than one.
  - c. equal to one.
  - d. less than one
37. A direct foreign investment would involve real. Physical assets in a foreign country, while a foreign portfolio investment would involve stocks, bounds, or money market instruments issued foreign companies. True or false?
- a. True
  - b. False
38. According to the capital-asset pricing model (CAPM), a security's expected (required) return is equal to the risk-free rate plus a premium
- a. equal to the security's beta
  - b. based on the unsystematic risk of the security.
  - c. based on the total risk of the security.
  - d. based on the systematic risk of the security
39. The risk-free security has a beta equal to \_\_\_\_\_, while the market portfolio's beta is equal to \_\_\_\_\_.
- a. one; more than one

- b. one; less than one
  - c. zero; one
  - d. less than zero; more than zero
40. The expected return on a risk-free security is zero.
- a. True
  - b. False
41. Beta is an index measure of systematic risk
- a. True
  - b. False
42. The MINIMUM required rate of return for accepting any investment proposal should be the one that keeps the common stock price (at the least) unchanged
- a. True
  - b. False
43. A firm's overall cost of capital is simply the sum of the firm's cost of equity, cost of debt, and cost of preferred stock.
- a. True
  - b. False
44. The tax advantage that comes from debt financing is of special benefit to a firm that is losing money.
- a. True
  - b. False
45. A goal or objective is a necessary first step for effective financial management.
- 
- a. True
  - b. False
46. Deciding on the total amount of assets needed by the firm is a key step in the investment decision.
- a. True
  - b. False
47. The goal of the firm should be to maximize earnings per share.
- a. True
  - b. False
48. In a large corporation, the firm's owners are usually also its top managers.
- a. True
  - b. False
49. Corporate management, acting as the owners' agent, makes all decisions in the owners' best interests.



- a. True
- b. False

50. Maximizing the price of a share of the firm's common stock is the equivalent of maximizing the wealth of the firm's present owners.
- a. True
  - b. False
51. Corporate Social Responsibility (CSR) is usually in conflict with the objective of shareholder wealth maximization.
- a. True
  - b. False
52. The price of a share of common stock acts as a barometer indicating how well management is doing on behalf of shareholders.
- a. True
  - b. False
53. A firm short of cash might well give greater emphasis to the payback period in evaluating a project.
- a. True
  - b. False
54. An investment with a short payback period is almost certain to have a positive net present value.
- a. True
  - b. False
55. The net present value of a project generally decreases as the required rate of return increases.
- a. True
  - b. False
56. A mutually exclusive project is one whose acceptance does not preclude the acceptance of alternative projects.
- a. True
  - b. False
57. Use of the IRR method implicitly assumes that the project's intermediate cash inflows are reinvested at the required rate of return used under the NPV method.
- a. True
  - b. False
58. If a project's cash flows are discounted at the internal rate of return, the NPV will be zero.
- a. True

b. False

59. Beta is the slope of
- the security market line
  - the capital market line
  - a characteristic line
  - the CAPM

60. A measure of "risk per unit of expected return."
- standard deviation
  - coefficient of variation
  - correlation coefficient
  - beta

**Answer in brief:**

**(40)**

- In what ways is the wealth maximization objective superior to the profit maximization objective? Explain.
  - What do you understand by NPV
  - Discuss CAPM model
  - Discuss hedging strategy
  - discuss sec 80c with respect to tax policy
  - the equity capital is cost free, do you agree
  - Are retained earning less expensive than the new issue of ordinary shares? Give your views
  - Debt is the cheapest source of funds, explain.
  - Briefly explain the factors that influence the planning of the capital structure in practice.
  - How does financial management of an international firm differ from that of domestic firm?
-

## HR RESEARCH SCHOLARS

### COURSE CONTENT

1. Introduction to Human Resource Management
2. Equal Opportunity and the Law
3. Strategic Human Resource Management and the HR Scorecard
4. Job Analysis
5. Personnel Planning and Recruiting
6. Employee Testing and Selection
7. Interviewing Candidates
8. Training and Developing Employees
9. Performance Management and Appraisal
10. Managing Careers
11. Establishing Strategic Pay Plans
12. Pay for Performance and Financial Incentives
13. Benefits and Services
14. Ethics, Justice, and Fair Treatment in HR Management
15. Labor Relations and Collective Bargaining
16. Employee Safety and Health
17. Managing Global Human Resources

## MODEL QUESTION-PAPER

### **Section -A**

**I: Select the right choice in the questions given below:**

**(60)**

1. \_\_\_\_\_ Measures the HR function's effectiveness and efficiency in producing employee behaviors needed to achieve the company's strategic goals.
  - a. HR scorecard
  - b. HR metrics
  - c. HR Profile
  - d. None of them
  
2. HPWS means,
  - a. Higher Program work structure
  - b. High performance work system
  - c. High program work structure
  - d. High performance work structure
  
3. The procedure through which you determine the duties of positions and the characteristics of the people to hire for them is called:
  - a. Competency based analysis
  - b. Job specifications
  - c. Job analysis
  - d. Job descriptions
  
4. Quantitative Job Analysis Techniques include the following:
  - a. Interviews
  - b. Questionnaires
  - c. Observation
  - d. Functional job analysis
  
5. Competency Based Job Analysis :
  - a. Is better than traditional job analysis
  - b. is more tactical than strategic

- c. breeds a “that’s not my job” attitude
  - d. Focuses more on how the worker meets the job’s objectives or actually accomplishes the work
6. Trend Analysis, Ratio Analysis and Scatter Plots are all methods of:
- a. Recruiting
  - b. On-Demand Recruiting Services
  - c. Qualifications Inventories
  - d. Forecasting Personnel Needs
7. Contingent staffing is:
- a. Potentially risky for employers
  - b. Beneficial in terms of productivity
  - c. Costs employers more than permanent workers
  - d. All of the above
8. Selection Devices that can be used to screen applicants are:
- a. Structured interviews
  - b. Job descriptions
  - c. Qualifications inventories
  - d. None of the above
9. Qualifications Inventories, and Replacement Charts are examples of tools to:
- a. Finding contingent workers
  - b. Forecast the supply of internal candidates
  - c. Recruiting a more diverse workforce
  - d. Ratio analysis
10. MBO is more related with
- a. Performance locale theory
  - b. Objective setting theory
  - c. Goal setting theroy
  - d. None of above
11. One of the legal implications of training related deicions include:
- a. discrimination
  - b. negligent training
  - c. overtime pay
  - d. all of the above
  - e. a & b only
11. \_\_\_\_\_ is a method that lists a number of traits and a range of performace for each. the employee is then rated by identifyng the socre that best describes his or her level of performace for each trait.
- a. Alteration ranking method
  - b. Forced distribution mehtod
  - c. Behaviorally anchored rating scale
  - d. Graphic rating scale

12. In performance appraisal, the problem that occurs when a supervisor's rating of a subordinate on one trait biases the rating of the person on other traits. That is called:
- Stereotyping error
  - Bias error
  - Projection error
  - Halo effect
13. The method of analyzing training needs by verifying that there is a performance deficiency is called:
- task analysis
  - on-the-job training
  - job instruction training
  - performance analysis
14. Criterion Related validity:
- is a test's first major requirement and refers to its consistency
  - demonstrates that those who do well on the test also do well on the job
  - shows that the test constitutes a fair sample of the content of the job
  - none of the above
15. Tests that measure general reasoning ability and mental abilities are called
- Personality and Interest Tests
  - Tests of Motor and Physical Abilities
  - Tests of Cognitive Abilities
  - Achievement Tests
16. How employers acquire and use applicants' background information is governed by:
- The ADA
  - The Fair Credit Reporting Act
  - The Federal Rehabilitation Act of 1973
  - The Immigration Reform and Control Act of 1986
17. Evaluating an employee's current and/or past performance relative to his or her performance standards is called PM (Performance management)
- True
  - false
18. The performance management process seeks to link the formal appraisal process to the organisation's ,
- Strategic goal
  - Org. structure
  - Culture
  - Stakeholder's need
19. The performance appraisal approach that requires managers to record specific examples of effective and ineffective performance is called
- management by objectives

- b. behavior observation scale
- c. graphic rating scale
- d. critical incidents method

20. \_\_\_\_\_ describes the relationship among the various functions and activities of the organization by showing the individuals, the groups or the departments responsible for performing these functions.
- a. Procedure chart
  - b. Organization chart
  - c. Organizational manuals
  - d. Procedure manuals
21. A coordinated series of work activity elements used to produce an identifiable and definable output that can be consumed or used independently is called \_\_\_\_\_.
- a. Function
  - b. Task
  - c. Duty
  - d. Responsibility
22. Essential or Non essential activity is assigned in \_\_\_\_\_ form.
- a. Duty identification form
  - b. Responsibility identification form
  - c. Task identification form
23. In DOL procedure is mainly used for.
- a. Job analysis
  - b. Job evaluation
  - c. Job identification
  - d. Job design
24. PAQ stands for....
- a. Procedure analysis questionnaire
  - b. Position analysis questionnaire
  - c. Process analysis questionnaire
25. Secretary III is an example for
- a. Job
  - b. Class
  - c. Family
  - d. Class series
26. Which of the following best describes the two primary elements of compensation?
- a. Profit sharing and incentive pay
  - b. Financial and nonfinancial pay
  - c. Fixed and variable pay
27. What is the first step in building a job worth hierarchy?

- a. Complete the job documentation
  - b. Conduct a job evaluation
  - c. Complete a job analysis
  - d. Build a base pay structure
28. Which of the following is the most appropriate use for a job description?
- a. To assist with exit interviews
  - b. To train temporary workers
  - c. To evaluate job content
  - d. To eliminate level cutters
29. The phrases “lifts cover, lays paper on glass, closes cover and presses start button” are examples of which term within a job description?
- a. Responsibilities
  - b. Duties
  - c. Tasks
  - d. Task elements
30. What best describes one of the purposes of job analysis?
- a. To define the level of coaching needed by supervisors
  - b. To define the scope of any follow-up studies
  - c. To document work processes for training purposes
  - d. To document the tools necessary to perform the job
31. Prior to conducting a job analysis interview, where might one obtain secondary job information?
- a. Employment applications
  - b. The Fair Labor Standards Act
  - c. The employee’s supervisor
  - d. Organizational charts
32. Which of the following is the most appropriate use for a job description?
- a. To assist with exit interviews
  - b. To train temporary workers
  - c. To evaluate job content
  - d. To eliminate job identification
33. Which of the following statements is most accurate regarding the market-based job evaluation method?
- a. The relative value of jobs is determined primarily by the nature and level of work.
  - b. The emphasis for evaluating jobs is based on the internal value of the different jobs within the organization.
  - c. Jobs may be slotted using job content if there is insufficient market data.
34. What are the two nonquantitative job evaluation methods?
- a. Ranking and classification
  - b. Job component and point factor
  - c. Market-based and job content



35. Which of the following best describes the ranking method of job content evaluation?
- It ranks jobs based on the level of complexity of the work.
  - It requires a high degree of technical knowledge of the job.
  - It is a whole-job rather than a factor-based job evaluation method.
  - It is difficult and expensive to implement.
36. Trait appraisals assess what a worker \_\_\_\_\_, while behavior appraisals assess what a worker \_\_\_\_\_
- does; is like
  - thinks; acts
  - acts; thinks
  - is like; does
37. Pay plans that are strictly linked to organizational performance are called:
- Piece-rate pay plans
  - Cost-of-living pay plans
  - Bonus plans
  - Gain sharing plans
38. Subjective measures are based on individual perceptions and can be used for appraisals based on traits, behaviors, and results.
- True
  - False
39. When relying on behaviors to assess performance:
- Employees and law courts involved in cases of potential employment discrimination are likely to view The focus is not on what employees do on the job but on the effects of their behaviors or their actual output.
  - Employees might not be motivated because the focus is on relatively enduring characteristics that cannot be changed in the short run.
  - There could be a potential problem because sometimes the same level of performance can be achieved through different behaviors.
40. Selection interviews are classified by their:
- Content.
  - How interview is administered.
  - Structure.
  - All of the above.
41. How a candidate reacted to actual situations in the past is asked during a \_\_\_\_\_ interview.
- Job-related
  - Situational
  - Behavioral
  - Stress
42. Jobs of approximately equal difficulty or importance as established by a job evaluation are grouped into:

- a. Benchmark jobs.
- b. A wage structure.
- c. Pay ranges.
- d. Pay grades.

44. Employers use \_\_\_\_\_ to make sure employees are working toward organizational goals.
- a. Training
  - a. Motivation
  - b. Orientation
  - c. Performance management
45. With \_\_\_\_\_ training, people become skilled workers through a combination of classroom instruction and OJT.
- a. Simulated
  - b. Job instruction
  - c. Programmed
  - d. Apprenticeship
46. The main advantage of programmed learning is that:
- a. It presents facts and follow-up questions.
  - b. Trainees learn more than they do from a textbook.
  - c. It reduces training time.
  - d. None of the above.
46. Because it is a subjective exercise, the selection interview is the least frequently used employee Selection procedure.
- a. true
  - b. false
47. With respect to compensation, \_\_\_\_\_ refers to how a job's pay rate in one company compares to the job's pay rate in other companies.
- a. External equity
  - b. Procedural equity
  - c. Individual equity
  - d. Internal equity
49. Compensable factors \_\_\_\_\_.
- a. Establish how the jobs compare to one another
  - b. Set the pay for each job
  - c. Are factors the jobs have in common
  - d. All of the above
50. A job evaluation committee should be appointed to perform the actual evaluation because
- a. Members will have different perspectives regarding the nature of the job.
  - b. Employee will more readily accept the results.
  - c. Job must be ranked for pay purposes.

d.1 and 2

51. Jobs of approximately equal difficulty or importance as established by a job evaluation are grouped into:
- Benchmark jobs.
  - A wage structure.
  - Pay ranges.
  - Pay grades.
52. The lifelong series of activities that contributes to a person's career exploration, establishment, success and fulfillment is:
- Career management.
  - Career planning.
  - A career.
  - Career development.
53. An employee's career is likely to be driven by the:
- Economy.
  - Employee.
  - Environment.
  - Organization.
53. \_\_\_\_\_ occur(s) when a new employee's high expectations and enthusiasm confront the reality of a boring, unchallenging job.
- Career-oriented appraisals
  - Mentoring
  - Realistic job previews
  - Reality shock
55. The process for enabling employees to better understand and develop their skills and interests and to use them effectively even after they leave the firm is career planning.
- True
  - False
56. Responsibility for the employee's career development and career success must be borne by the employer.
- True
  - False
57. The career planning process means the employee must conduct a personal SWOT analysis.
- True
  - False
58. Reality shock occurs when a new employee's high expectations and enthusiasm confront the reality of a boring, unchallenging job.
- True
  - False

59. A manager matches an employee's strengths and weaknesses with a feasible career path and required development work through mentoring.
- True
  - False
60. In a career planning workshop, participants are expected to be actively involved, completing career planning exercises and participating in career skills practice sessions.
- True
  - False

## **Section:-B:**

### **Short questions**

**(40)**

1. Explain and differentiate line and staff aspects of HRM.
2. Differentiate job description and job specification.
3. How training evaluation can be done?
4. Differentiate selection and recruitment.
5. Define exit interview and appraisal interview.
6. Discuss the methods for appraising performance of employees in organization.
7. What are the main roles of individual, manager and employer in career development?
8. What are the main types of tests for selection of employees? Explain each.
9. Explain main five steps of election for union.
10. Discuss various methods for collecting job analysis information.
11. How can employers protect themselves against negligent hiring claims?
12. Explain how you would apply our principles of learning in developing a lecture, say on orientation and training.
13. Discuss the pros and cons of four performance appraisal tools.
14. Establish strategic pay plans.
15. Explain competency mapping,

# **IT RESEARCH SCHOLARS**

## COURSE CONTENT

1. Information Systems Management
2. Business Process Management
3. E-Business and E-Commerce
4. Enterprise Engineering
5. Database Management and Concepts of business intelligence
6. Business Collaboration & e-Services
7. Systems Analysis and Design
8. Software Development Methodologies
9. Data warehousing and data mining
10. Software Process Models
11. Foundations of Software Engineering
12. Software quality assurance
13. Knowledge Management
14. Information Systems Security
15. Authentication and Access Control
16. Workflow Management Systems
17. Business Processes Re-engineering
18. Managing Software Projects
19. Database Security and Transaction Support
20. Modeling Concepts and Information Integration Tools
21. Software Quality
22. Business Processes optimization

## **MODEL QUESTION-PAPER**

### **Section -A**

**I: Select the right choice in the questions given below:**

**(60)**

1. E-commerce and e-business are:
  - A. The same
  - B. Increasingly valuable tools for more traditional firms
  - C. Growing more slowly with the failure of the dot-coms
  - D. Restricted to the Web
  
2. The purpose of check digit verification of an account number on an update transaction is to:
  - A. Verify that the account number corresponds to an existing account in the master file
  - B. Prevent an incorrect match of the update transaction to the master file
  - C. Ensure that supporting documentation exists for the update transaction
  - D. Link the account number to other fields in the file
  
3. What is a primary risk of a 'phased' implementation?
  - A. Previous implementations may need to be reworked.
  - B. The project may lose momentum.
  - C. Business Analysts will find problems in the data sooner.
  - D. Executives will lose focus.
  - E. The project budget may be exceeded.
  
4. What is the interactive, computer-based information system that collects data on transactions and operations?
  - A. Transaction processing system
  - B. Decision support system
  - C. Executive information system
  - D. Expert system
  
5. What level of decision is appropriate for a manufacturing industry if it involves rearranging the work area, altering production schedules, changing inventory methods, or expanding quality control measures?
  - A. Operational
  - B. Tactical
  - C. Strategic

D. None of the above

6. The purpose of decision support systems is to:
  - A. Replace a manager's judgment during the decision-making process
  - B. Provide a predefined sequence of analysis during the process of problem solving
  - C. Provide interactive assistance during the process of problem solving
  - D. Automate a manager's decision-making process
  
7. Establishing an e-business requires that you either run a \_\_\_\_\_ or pay someone to run it for you, so you should understand some of the main issues in Web \_\_\_\_\_.
  - A. Server, servers
  - B. Printer, site
  - C. Scanner, servers
  - D. Printers, servers
  
8. Projections and responses to queries are information output characteristics associated with a (n):
  - A. DSS
  - B. MIS
  - C. ESS
  - D. TPS
  
9. Business models typically use:
  - A. Flow diagrams to represent various aspects of the process and relationships
  - B. Digital logic diagrams to represent the process and various relationships
  - C. Mathematical equations to represent the process and the various relationships
  - D. Venn diagrams to represent the process and the various relationships
  
10. Strategic changes often involve:
  - A. Applying for funds from a bank before changes are considered
  - B. Laying off old employees before changes are made
  - C. Hiring new IS teams before any of your competitors
  - D. Implementing new technology before any of your competitors
  
11. In an architecture where 'atomic' data are maintained in the Data Warehouse and used to create the Data Marts, what is the best implementation for the Data Warehouse databases?
  - A. Multi-Dimensional Database Management System
  - B. Hierarchical Database Management System
  - C. Relational Database Management System
  - D. Object Database Management System
  - E. Any Database Management System is acceptable.
  
12. Information systems can facilitate supply chain management by:
  - A. Tracking the status of orders
  - B. Rapidly communicating orders
  - C. Providing product specifications
  - D. Doing all of the above

12. The E-commerce domain that involves business activity initiated by the consumer and targeted to businesses is known as:
- A. Consumer to Consumer (C2C).
  - B. Business to Consumer (B2C).
  - C. Consumer to Business (C2B).
  - D. Consumer to Consumer (C2C).
  - E. Consumer to Business (C2B).
  - F. Business to Business (B2B).
  - G. Business to Consumer (B2C).
14. Why would an organization decide to implement a Data Warehouse on a mainframe computer with its For cost considerations only.
- a. For improved response time on queries to the Data Warehouse.
  - b. The size of the Data Warehouse has outgrown the small computer's capability of handling it.
  - c. To avoid large network requirements as a result of having to move large amounts of data between platforms and database management systems.
  - d. The number of Data Warehouse users has increased to a point where the smaller platforms cannot handle them.
15. The type of website that is designed to build customer goodwill and to supplement other sales channels rather than sell the company's products directly is known as a \_\_\_\_\_ website.
- A. click-and-mortar
  - B. marketing
  - C. corporate
  - D. customer service
  - E. click-and-mortar
  - F. marketing
  - G. corporate
  - H. customer service
16. \_\_\_\_\_ occurs when one business transmit computer-readable data in a standard format to another business.
- A. EFT
  - B. VAN
  - C. EDI
  - D. LAN
17. What are the characteristics of a good candidate for a Web application?
- A. One that provides data in multiple formats to a small group of business analysts and management.
  - B. Any application intended to be used by executive management.
  - C. One that provides data in multiple formats and that requires a low level of processing to a large number of users.
  - D. Any application providing access to a Data Warehouse, Data Mart, or Operational Data Store.
  - E. One that requires intensive processing and provides data in a few formats to a large number of



users.

18. One significant components of \_\_\_\_ can be the investment a seller makes in equipment or in the hiring of skilled employees to supply the product or service to the buyer.
- economic cost
  - transaction cost
  - SWOT analysis
  - retention cost
19. What does the statement "A Data Warehouse database is non-volatile" mean?
- Data Warehouse databases contain only historical transaction data.
  - Business requirements for a Data Warehouse are stable.
  - Data Warehouse database structures change very infrequently.
  - Data within the databases do not change from second to second.
  - Data Warehouse databases support the creation of a set of reports.
20. \_\_\_\_\_ is the degree to which the product offers utility to a potential customer .
- Differentiation
  - Relevance
  - Perceived value
  - brand
21. What is typically discovered when historical data are first extracted from legacy systems for initial into the Data Warehouse loading?
- Flaws in the warehouse database design.
  - Flaws in the extraction program code.
  - The need for additional data sources.
  - Extraction run times are shorter than expected.
  - Undocumented changes in the content, usage, and structure of the historical data.
22. Most courts will hold that a(n) \_\_\_\_\_ exists when the terms of a contract have been reduced to some tangible form.
- writing
  - file
  - agreement
  - term
23. Which of the following statements correctly describe a Dimension table in Dimensional Modeling?
- Dimension tables contain fields that describe the facts.
  - Dimension tables do not contain numeric fields.
  - Dimension tables are typically larger than fact tables.
  - Dimension tables do not need system-generated keys.
  - Dimension tables usually have fewer fields than fact tables

24. Pay Pal earns a profit on the \_\_\_\_\_ which is money that is deposited in Pay Pal accounts and not used immediately.
- A. scrip
  - B. commission
  - C. transaction cost
  - D. Float
25. When preparing a website, designers should ensure that the site enables user-to-user communication. This design feature is known as \_\_\_\_\_.
- A. community
  - B. context
  - C. commerce
  - D. connection
  - E. context
  - F. community
  - G. commerce
  - H. connection
26. Primitive operations common to all record management system include
- A. print
  - B. sort
  - C. look-up
  - D. all of above
27. Which of the following contains a complete record of all activity that affected the contents of a database during a certain period of time?
- A. report writer
  - B. query language
  - C. data manipulation language
  - D. transaction log
  - E. none of the above
28. Referential Integrity is a set of rules
- A. used to ensure relationships between records in related tables are valid
  - B. Used to lookup data in another table
  - C. Used to make sure data are correct.
  - D. None of the above
29. The generic two-level data warehouse architecture includes which of the following?
- A. At least one data mart
  - B. Data that can extracted from numerous internal and external sources
  - C. Near real-time updates
  - D. All of the above.
30. The extract process is which of the following?
- A. Capturing all of the data contained in various operational systems

- B. Capturing a subset of the data contained in various operational systems
- C. Capturing all of the data contained in various decision support systems
- D. Capturing a subset of the data contained in various decision support systems

31. A goal of data mining includes which of the following?

- A. To explain some observed event or condition
- B. To confirm that data exists
- C. To analyze data for expected relationships
- D. To create a new data warehouse

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33. Which data administration subsystem periodically backs up information contained in a database?

- a) Concurrency control facilities
- b) Reorganization facilities
- c) Backup and recovery facilities
- d) Security management facilities

34. Software \_\_\_\_\_ is work done to enhance software functionality, correct errors and improve the performance of software.

- A. re-design
- B. maintenance
- C. corrections
- D. re-engineering

35. A corporation uses formal methods for requirements specification because they believe that it guarantees that the customer's needs will be met by the new software application. Which statement about this corporation's belief is true?

- A. Formal methods do provide this guarantee because they are safer to use.
- B. Formal methods do not provide this guarantee because they are not testable.
- C. Formal methods do provide this guarantee because they are based on mathematical techniques for which proof systems exist.
- D. Formal methods do not provide this guarantee because they are difficult to communicate accurately to the user.

36. Software deteriorates rather than wears out because

- a) Software suffers from exposure to hostile environments
- b) Defects are more likely to arise after software has been used often
- c) Multiple change requests introduce errors in component interactions
- d) Software spare parts become harder to order

37. Which of the following aspects are normally associated with defining a 'knowledge worker'? Select all that apply

- a) Carry out work which is intellectual in nature.
- b) Highly valued occupational elite.
- c) Are typically employed on full-time permanent contracts.
- d) Carry out work which contributes significantly to the performance of their employers.
- e) Use established bodies of formal codified knowledge.

38. What is meant by a personalization approach to knowledge management activities?

- A. Where workers share their tacit knowledge with other people.
- B. The use of IT systems where employees codify their own knowledge and use systems to search for
- C. knowledge they don't possess.
- D. Where no structured approach to knowledge management is in place.

39. What does the term 'Ad-hoc Analysis' mean?

- A. Business analysts use a subset of the data for analysis.
- B. Business analysts access the Data Warehouse data infrequently.
- C. Business analysts access the Data Warehouse data from different locations.
- D. Business analysts do not know data requirements prior to beginning work.
- E. Business analysts use sampling techniques

40. How do highly distributed source systems impact the Data Warehouse or Data Mart project?

- A. The source data exists in multiple environments.
- B. The location of the source systems has minimal impact on the Data Warehouse or Data Mart implementation.
- C. The timing and coordination of software development, extraction, and data updates are more complex.
- D. Large volumes of data must be moved between locations.
- E. Additional network and data communication hardware will be needed.

41. Which of the following is an example of a process performed by a Level 3 OLAP tool?

- A. Drill down to another level of detail.
- B. Display the top 10 items that meet specific selection criteria.
- C. Trend analysis.
- D. Calculate a rolling average on a set of data.
- E. Display a report based on specific selection criteria.

42. In a Data Mart Only architecture, what will the Data Mart Development Team(s) encounter?

- A. There is little or no minimal data redundancy across all of the Data Mart databases.
- B. Issues such as inconsistent definitions and dirty data in extracting data from multiple source systems will be addressed several times.
- C. Database design will be easier than expected because Data Mart databases support only a single user.
- D. There is ease in consolidating the Data Marts to create a Data Warehouse.
- E. It is easy to develop the data extraction system due to the use of the warehouse as a single data source.

43. What is the primary responsibility of the 'project sponsor' during a Data Warehouse project?

- A. To manage the day-to-day project activity.

- B. To review and approve all decisions concerning the project.
- C. To approve and monitor the project budget.
- D. To ensure cooperation and support from all 'involved' departments.
- E. To communicate project status to higher management and the board of directors.

44. What are Metadata?

- A. Data used only by the IS organization.
- B. Information that describes and defines the organization's data.
- C. Definitions of data elements.
- D. Any business data occurring in large volumes.

45. How can the managers of a department best understand the cost of their use of the data warehouse?

- a) A percentage of the business department's budget should be directed to the maintenance and enhancement of the Data Warehouse.
- b) Institute a charge-back system of computer costs for the access to the Data Warehouse.
- c) Develop a training program for department management.
- d) Provide executive management with computer utilization reports that show what percentage of utilization is due to the Data Warehouse.
- e) Business managers should participate in the acquisition process for computer hardware and software.

46. Which of the following classes of corporations can gain the most insights from their legacy data?

- a) A corporation that wants to determine the attitude of its customers towards the corporation.
- b) A corporation that offers new products and services.
- c) A new corporation.
- d) A corporation that has existed for a long time.
- e) A corporation that is constantly introducing new and different products and services.

47. Which of the following is NOT found in an Entity Relationship Model?

- a) A definition for each Entity and Data Element.
- b) Entity Relationship Diagram
- c) Entity and Data Element Names
- d) Fact and Dimension Tables
- e) Business Rules associated with the entities, entity relationships, and the data elements

48. What is Data Mining?

- a) The capability to drill down into an organization's data once a question has been raised. The setting up of queries to alert management when certain criteria are met.
- b) The process of performing trend analysis on the financial data of an organization.
- c) The automated process of discovering patterns and relationships in an organization's data.
- d) A class of tools that support the manual process of identifying patterns in large databases.

49. What does implementing a Data Warehouse or Data Mart help reduce?

- a) The data gathering effort for data analysis.
- b) Hardware costs.
- c) User requests for custom reports.
- d) Costs when management downsizes the organization.

- e) All of the above.
50. Profitability Analysis is one of the most common applications of data warehousing. Why is Profitability Analysis in data warehousing more difficult than usually expected?
- a) Almost every manager in an organization wants to get profitability reports.
  - b) Revenue data cannot be tracked accurately.
  - c) Expense data is often tracked at a higher level of detail than revenue data.
  - d) Revenue data is difficult to collect and organize.
  - e) Transaction grain data is required to properly compute profitability figures.
51. Which of the following would NOT be considered a recurring cost of either Data Warehouse User Support or Data Warehouse Administration?
- a) Capacity Planning
  - b) Creation of New Data Marts
  - c) Security Administration
  - d) Data Archiving
  - e) Database Management System Software Selection
52. Why is it important to track all project issues and their resolution?
- a) To show management what the project team has accomplished.
  - b) Issues will be brought back up even after they have been resolved.
  - c) Provides an audit trail for use in internal or external audits.
  - d) There is no need to track issues once they are resolved.
  - e) Tracking is needed for project status report.
53. When a physical database design contains summary data, what must the database designer always ensure?
- a) Non-numeric (non-summary) data elements should not be placed in a summary table.
  - b) The detail data used to create the summary data is kept in case the Data Warehouse database needs to be reloaded.
  - c) The level of detail lost by summarization will not affect the business analysts' use of the data.
  - d) Each table with summary data has a 'from' and 'to' date.
  - e) The appropriate business rule(s) describing how the data will be summarized is in place.
54. Which of the following is a business benefit of a Data Warehouse?
- a) Customers are happier.
  - b) Reduction in Government interference.
  - c) Decision makers will be able to make more decisions each day.
  - d) Ability to identify historical trends.
  - e) Improves morale of the business analysts.
55. How does Ad-hoc Access differ from Managed Query Access?
- a) Ad-hoc access provides users more flexibility when retrieving data.
  - b) Ad-hoc query access requirements are easier to anticipate.
  - c) Managed query access is more frequently implemented.
  - d) Managed query access give users more ways of getting the data they need.
  - e) Managed query response times are easier to optimize.
56. What is a 'snowflake' schema?
- a) The dimension tables are 'normalized'.
  - b) The dimension tables can refer to more than one fact table.
  - c) All recurring groups of attributes are completely removed from dimension tables.

- d) A schema that can be implemented only with an MDDB Database Management System.
  - e) Any database implemented with a network Database Management System.
57. Which of the following describes a successful decision support environment?
- a) Depends heavily on sets of 'canned' queries to provide good performance and reduced costs
  - b) Has data warehouse and data mart databases that are of terabyte size
  - c) Costly
  - d) Totally independent of the operational systems
  - e) Iterative and evolutionary
58. What is an Operational Data Store?
- a) A set of databases that serve as a 'staging' area to facilitate consolidating data from several, distributed-source systems.
  - b) A set of databases that support OLAP.
  - c) A set of databases that support reporting from an application system.
  - d) A set of databases that provide integrated operations data to serve the organization's day-to-day activities.
  - e) A set of databases to provide operational data for a single department.
59. When is it appropriate to 'denormalize' a relational database design for a Data Warehouse database?
- a) When disk space is low.
  - b) When memory is low.
  - c) When the analysis requirements are understood.
  - d) Any time.
  - e) When the database design is no longer expected to change.
60. Where in the warehouse architecture is it appropriate to calculate 'derived' data elements for storage?
- a) As part of the business analysts' queries.
  - b) In an application system developed solely to address 'derived' data elements.
  - c) When the data are extracted from the source systems.
  - d) After the business analysts have extracted their data from the Data Warehouse.
  - e) Just prior to loading the data into the Data Warehouse databases

## **Section:-B**

### **Short questions:**

**(40)**

1. Explain the cost estimation procedure using COCOMO Model.
2. Explain the organizational structure of the software development.
3. What features of the information systems she is using support the assertion that it is more of a Decision Support System (DSS) than a traditional Management Information System (MIS)?
4. Explain how Information technologies can be used to reduce each of the 5 threats identified in Porter's competitive model
5. Describe the complete life cycle for the development of on-line E-commerce system using any of the existing E-commerce systems.
6. With the help of any example web-site, explain the perspectives of the buyers and sellers in a B2B E-Commerce type'. Also, mention the benefits over the traditional commerce. List the disadvantages, if any.
7. Identify six factors that influence the maintainability of the system.
8. List the main features of the object-oriented approach to databases.

9. Explain how the Internet reduces information asymmetry.
10. Describe the differences between a data warehouse and data mart.
11. Identify the six phases of the SDLC.
12. Identify three ways that data security is built into a file.
13. Describe what a risk assessment is and why it's necessary.
14. Describe the strategies normally used for an inference engine.
15. Compare and contrast the different capabilities of DSS and MIS systems. If you had to do without one of them, which would it be? Why?