

**RESEARCH METHODOLOGY AND IPR
(CSEN 5102)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) What are the core elements of a dissertation?
(a) Introduction, Data collection, Data analysis, Conclusion
(b) Summary, Literature review, Data collection, Conclusion, Bibliography
(c) Research plan, Research data, analysis, References
(d) Introduction, Literature review, Research Methodology, Results, Discussion, Conclusion.
- (ii) The format of thesis writing is the same as in
(a) Writing of Seminar representation
(b) Preparation of research paper/article
(c) A research dissertation
(d) Presenting a workshop/conference paper.
- (iii) What is the major attribute of correlation analysis?
(a) Association among variables (b) Difference among variables
(c) Regression among variables (d) Variation among variables.
- (iv) Inductive reasoning is
(a) data collection analysis method
(b) theory data collection analysis method
(c) data collection method
(d) both (a) and (b)
- (v) If a random variable X satisfied Poisson distribution with a mean value of 3, then the probability that $X \geq 2$ is
(a) $1 - 2e^{-3}$ (b) $1 - 4e^{-3}$ (c) $1 + 2e^{-3}$ (d) $1 + 4e^{-3}$
- (vi) A man takes a step forward with probability p and backwards with probability q . The probability that at the end of 11 steps, he is 1 step away from the starting point is
(a) ${}^{11}C_6 p^5 q^6$ (b) ${}^{11}C_6 p^6 q^6$ (c) ${}^{11}C_6 p^5 q^6$ (d) ${}^{11}C_6 p^6 q^5$

- (vii) In which distribution, mean, median and mode are equal?
 (a) Normal (b) Uniform (c) Binomial (d) Poisson
- (viii) The rights of a patentee are
 (a) sell or distribute (b) license
 (c) assign the property to others (d) all of the above.
- (ix) Which spreadsheet works on text data?
 (a) MAX() (b) MID() (c) COUNT() (d) MIN()
- (x) Which symbol is used in MS Excel to indicate a cell reference absolute?
 (a) \$ (b) # (c) @ (d) &.

Fill in the blanks with the correct word

- (xi) _____ scale is simply a system of assigning number symbols to events in order to label them.
- (xii) Variables whose values cannot be expressed numerically are called _____ variables.
- (xiii) _____ research focuses on 'cause and effect' relationship.
- (xiv) Mean and variance are equal in _____ distribution.
- (xv) _____ protect the use of information and ideas that are of commercial values.

Group - B

2. (a) Analyze the importance of literature review in formulating a problem. [[CO1](Analyze/IOCQ)]
 (b) Design a comprehensive layout of a project report. [[CO2](Design/HOCQ)]
 (c) Outline the various criteria of good research. [[CO2](Outline/IOCQ)]
4 + 4 + 4 = 12
3. (a) Describe the different components present in a research problem. [[CO1,CO2](Understand/LOCQ)]
 (b) Analyze the different steps involved in development of a research design. [[CO2](Analyze/IOCQ)]
 (c) What are different ways to determine sample design of a study? [[CO2](Understand/LOCQ)]
4 + 4 + 4 = 12

Group - C

4. (a) What do you mean by dependent and independent variable? [[CO3](Remember/LOCQ)]
 (b) Discuss the role of extraneous variables in research work. [[CO3](Outline/IOCQ)]
 (c) How can you examine your hypothesis by statistical methods? [[CO4](Analyze/IOCQ)]
(2 + 2) + 4 + 4 = 12
5. (a) Comment on the steps involved in the techniques of interpretation. [[CO3](Understand/IOCQ)]

- (b) Analyze the precautions that a researcher should take during interpretation of a report. [[C02](Analyze/IOCQ)]
- (c) Explain with reasons what do you mean by a technical report and a popular report. [[C04](Remember/LOCQ)]
- 4 + 4 + 4 = 12**

Group - D

6. (a) The following distribution gives the weight of 60 students of a class. Find the modal class and the modal weight of the students.

Weight (in kg)	40-44	44-48	48-52	52-56	56-60	60-64	64-68	68-72
No. of students	4	6	10	14	10	8	6	2

[[C05](Understand/LOCQ)]

- (b) The following distribution gives those weights of 60 students of a class. Find the mean and mode weights of the students.

Weight (in kg)	40 - 44	44 - 48	48 - 52	52 - 56	56 - 60	60 - 64	64 - 68	68 - 72
No. of students	4	6	10	14	10	8	6	2

[[C05](Understand/LOCQ)]

- (c) The covariance between x and y is 30, variance of x is 25 and variance of y is 144. Calculate the correlation coefficient.

[[C05](Understand/LOCQ)]

4 + 4 + 4 = 12

7. (a) Write the distribution function of binomial distribution. [[C05](Remember/LOCQ)]
- (b) Find the probability of getting at least 5 times head on tossing an unbiased coin for 6 times by using the binomial distribution. [[C05](Understand/IOCQ)]
- (c) If the probability of choosing incorrect answer in an examination is 0.01, determine the chance that out of 500 students more than 1 will choose incorrect answer. [[C05](Understand/LOCQ)]

2 + 4 + 6 = 12

Group - E

8. (a) What is a patent? [[C06](Remember/LOCQ)]
- (b) What are the different types of patent that you know of? [[C06](Remember/LOCQ)]
- (c) What is IPR? Why do we need it? [[C06](Remember/LOCQ)]

3 + 3 + (2 + 4) = 12

9. (a) Draw the bar chart and pie chart for the following data. The height of students, in cm, of class 9 in a school, divided in five categories:

Category	I Height ≤ 120	II 120 < Height ≤ 135	III 135 < Height ≤ 150	IV 150 < Height ≤ 165	V Height > 165
No. of students	50	90	110	60	50

[[C05](Apply/IOCQ)]

(b) What could be the consequences if a researcher is caught for plagiarism?

[[CO6](Remember/LOCQ)]

6 + 6 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	56.25	39.58	4.17