RESEARCH METHODOLOGY AND IPR
(CSEN 5102)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

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

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) An Interview, in which the interviewer encourages the respondent to talk freely about a given topic, is called
(a) Focused Interview (b) Structural Interview
(c) Unstructured Interview (d) Clinical Interview.

(ii) The most frequently occurring score in a distribution is
(a) Mean (b) Mode (c) Median (d) Quartile.

(iii) Questionnaire is a
(a) research method (b) measurement technique
(c) tool for data collection (d) data analysis technique.

(iv) Which of the following is not covered under the Intellectual Property Rights?
(a) Copyrights (b) Patents (c) Trade Marks (d) Thesaurus.

(v) The ANOVA procedure is a statistical approach for determining whether or not
(a) the means of two samples are equal
(b) the means of two or more samples are equal
(c) the means of more than two samples are equal
(d) the means of two or more populations are equal.

(vi) Random Sampling is also known as
(a) Predictive Sampling (b) Probability Sampling
(c) Statistical Sampling (d) Haphazard Sampling.

(vii) Type I error in testing of hypothesis means
(a) Accepting the null hypothesis when it is, in fact, true
(b) Rejecting the null hypothesis when it is, in fact, true
(c) Accepting the alternative hypothesis when it is, in fact, true
(d) Rejecting the alternative hypothesis when it is, in fact, true.

(viii) Analysis of variance is a statistical method used to test differences between two or more
(a) standard deviations (b) variances
(c) means (d) proportions.

(ix) Practice of taking someone else's work or ideas and passing them off as one's own is known as
(a) paraphrasing (b) piracy
(c) appropriation (d) plagiarism.

(x) The term 'precision' means
(a) The overall quality of the data.
(b) The level of detail at which data is stored
(c) The lack of bias in the data
(d) The extent to which a value approaches its true value.

Group – B

2. (a) What is research? Illustrate different types of research with suitable examples.

(b) What is Scientific Research?

(3 + 6) + 3 = 12

3. (a) What is data? Differentiate between Primary and Secondary Data.

(b) Briefly explain the steps involved in a research process.

(2 + 2) + 8 = 12

Group – C

4. (a) What is the role of the existing literature in research? How do we select a topic for research?

(b) What are the steps that we need to follow for problem identification?

(6 + 3) + 3 = 12

5. (a) Compare and contrast Conceptual versus Empirical Research with suitable examples.

(b) What are the different kinds of procedures to conduct a survey? Discuss each of the methods in brief.

4 + 8 = 12

Group – D

6. (a) Consider 2 ad hoc networks with equal investments and equal lives, whose expected data flows in Terabytes are as summarized in the following table. Identify the network which is more consistent in terms of data flow.

Period	1	2	3	4	5
Network A	80	85	70	100	115
Network B	100	70	90	80	150

(b) A sample of heights of 6400 English men has a mean of 170 cm and an SD of 6.4 cm. while a sample of heights of 1600 Americans has a mean of 172 cm and an SD of 6.3 cm. Does the data indicate that Americans are on the average, taller than the Englishmen? (Given that $z_\alpha = \pm 2.33$ at 1% LOS).

6 + 6 = 12

7. (a) Prove that the sum of the deviations of all the values taken about their mean is zero.

(b) Write the differences between t-test and ANOVA test.

(c) (i) Assume X, Y, and Z are random variables, such that Z = X + Y. Find Var(Z) in terms of X and Y.

(ii) Suppose that we choose a point (X,Y) uniformly at random in the unit disc, given by $D = \{(x, y) \mid x^2 + y^2 \leq 1\}$. Are X and Y uncorrelated?

4 + 3 + (2 + 3) = 12

Group – E

8. (a) The research work to be completed needs to be recorded appropriately so that it can be presented to the readers in an effective manner. Discuss various aspects considered in writing a research report.

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

6 + (2 + 4) = 12

9. (a) What is IPR? Why do we need it?

(b) Draw the bar chart and pie chart for the following data: The height of students of classes 9 and 10 in a school, divided in five categories.

Category	I (Below 4 ft)	II (Between 4 ft & 5 ft)	III (Between 5 ft & 5.5 ft)	III (Between 5.5 ft & 6 ft)	V (above 6 ft)
No. of std	30	100	120	70	40

(4 + 2) + (4 + 2) = 12

Department & Section	Submission Link
CSE	https://classroom.google.com/c/MjM3MzEwODM0NDg4/a/MjkzNjEyMzM4Mzgx/details