

**Indian Statistical Institute
Documentation Research and Training Centre
M.S. Library and Information Science, 2017-19
Semester - II (Mid-Term)**

Paper - 8, Elements of Statistics and Research Methodology

Date: 27/02/2018

Duration: 1.5 Hours

Marks: 40

Group: A

Answer any four from Group: A

4X5 = 20

1. "Research is a systematic and scientific process". Justify the statement.
2. Research is not just data collection but also.....

Complete sentence with appropriate explanations.
3. Categorise the following set of questions as Open-Ended Question or Close-Ended Question:
 - a. What are various stages of conducting research?
 - b. 'Literature survey is part of research' - State True or False
 - c. What is the importance of private sector banks in a developing country?
 - d. What are the different factors to be considered while conducting an interview?
 - e. Did you take information science courses in Post Graduation?
4. Explain, which type of research problem is the following - "Why do leaves change colour in the fall?"
5. Explain, which type of research problem is the following - "What are the most effective intangible employee motivation tools in hospitality industry in the 21st century?"

6. "A scientist wants to see if the brightness of light has any effect on a moth being attracted to the light." - Explain the *independent, dependent and extraneous independent variables* in the described problem.

Group: B

Answer any four from Group: B.

$4 \times 5 = 20$

7. Write down the sample space for the following random experiments:
- A fair coin is tossed repeatedly until head is obtained.
 - A box contains 1 red and 3 identical white balls. Two balls are drawn at random in succession without replacement. (2.5+2.5)
8. Consider the experiment of tossing a coin. If the coin shows head, toss it again but if it shows tail, then throw a die. Write down the sample space. Find the conditional probability of the event that 'the die shows a number greater than 4' given that 'there is at least one tail'. (2+3)
9. When an event E independent of itself? Prove that if E and F are independent events, then so are the events E and complement of F. (1.5+3.5)
10. Write down the formula for the Poisson random variable. Find the expectation for the same. (1.5+3.5)
11. Suppose that X is a continuous random variable whose probability density function is given by
- $$f(x) = \begin{cases} C(8x-3) & 0 < x < 5 \\ 0 & \text{otherwise} \end{cases}$$
- What is the value of C?
 - Find $P\{x > 1\}$. (2.5+2.5)