

**Ph. D. IN COMPUTER SCIENCE
(PHDCS)**

Term-End Examination

December, 2024

RCS-001 : RESEARCH METHODOLOGY

Time : 3 Hours

Maximum Marks : 100

Weightage : 50%

***Note : Question No. 1 is compulsory. Attempt any
three questions from the rest.***

1. (a) Differentiate between Qualitative Research and Quantitative Research. 5
- (b) What is h -index ? How can you calculate the h -index ? Discuss the role of h -index in active research. 5
- (c) Discuss the organization of Ph. D. thesis. 5
- (d) Formulate the Knapsack problem and explain its complexity. 5

- (e) What are Monographs ? Discuss the role of monographs in literature review. 5
 - (f) Discuss the mathematical formulation of simulating zero acceleration in animation. 5
 - (g) Verify the statement “Best case for Bubble Sort is worst case for Quick Sort”. 5
 - (h) How does the ‘term paper’ differ from ‘review paper’ and ‘technical paper’ ? 5
2. (a) Define a combinatorial optimization problem. Formulate any *two* combinatorial optimization problems and explain their complexity. 10
- (b) What is three-pass mechanism ? Explain the process of reading a research paper, using three-pass mechanism. 10
3. (a) Explain the key components of a research proposal and also mention the tentative format for a research proposal in Computer Science. 10

- (b) The administration of an institute claims that the percent (%) obtained by their students is higher than the National average, which happens to be 55%, with a standard deviation of 20%. To prove this they collected the data of four students which is 68%, 79%, 90% and 62%. 10
- (i) Write H_0 and H_1 hypothesis.
- (ii) Is their claim valid ? Justify.
4. (a) Explain the process of identifying suitable literature, narrowing your search, analyzing the literature and writing the review of it. 10
- (b) What is simulation ? How does simulation differ from modelling ? Is it always good to do simulation ? Justify. 5
- (c) What is normal distribution ? What is its significance in statistical analysis ? Differentiate between Z-test and t -test. 5

5. Write short notes on any *four* of the following :

4×5=20

- (i) Teleological Reasoning
- (ii) Plagiarism
- (iii) Ethics in research
- (iv) Methods of finding Association
- (v) Methods of Aggregation and Visualization

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