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Reg. No. : .....

Name : .....

Ph.D. ENTRANCE EXAMINATION 2023

FACULTY OF APPLIED SCIENCES AND TECHNOLOGY

COMPUTER SCIENCE

Time : 3 Hours Max. Marks : 100

Instructions **:**

1) *Answer **any ten** questions each from* Section ***A*** *and* Section ***B.***
2) *Each question carries **5** marks.*
3) *No additional Answer sheets will be provided.*
4) *Candidates should clearly indicate the section, Question number in the answer booklet.*

Section – A

Research Methodology

I. Answer any **ten** questions. Each question carries **5** marks.

1. Describe the differences between descriptive research and analytical research.

2. Describe the steps in formulating a research problem with an example.

3. What is the need of a literature review? Explain the literature review method which can be used to find the minimum set of items for reporting in systematic reviews and meta-analysis?

4. What are the steps in developing a research design?

5. Briefly describe the structure and components of scientific reports.

6. Which are the different types of scientific reports?

7. Explain in detail about Intellectual property rights.

8. Explain type I and type II errors with an example.

9. Explain various indexing measures which can be used to determine the quality of a journal.

10. What do you mean by plagiarism and which are the different types of plagiarism? Mention few steps that can be taken for avoiding plagiarism.

11. What do you mean impact factor? What is the need of impact factor? How impact factor is calculated?

12. What is linear regression? With an example explain the use of linear regression analysis.

13. Which are the different measures of central tendency and dispersion which can be used for data analysis? Give Examples.

14. With an example explain in detail about normative ethics.

15. Explain the use of visualization methods in research problem.

(10 × 5 = 50 Marks)

Section – B

Computer Science

II. Answer any **ten** questions from the following.

1. Consider that a CPU is using Preemptive Shortest job first scheduling algorithm, find the average completion time, average turnaround time and average waiting time if the processes id, arrival time and burst time is given in the below table. Also show the Gantt chart.

PROCESS ID	ARRIVAL TIME	BURST TIME
W1	1	3
W2	2	6
W3	1	2

W4	3	7
W5	2	4
W6	5	5

2. Write a C program to implement two priority queues using linked list and merge this two priority queue into a new queue based on the priorities of the elements.

3. Explain image sampling and quantization with examples.

4. With examples explain the different types of normal forms in DBMS.

5. Alice and Bob sets up a common secret key between themselves using the Diffie Hellman key exchange technique. They agree on 7 as the modulus and 3 as the primitive root. Party A chooses 5 and party B chooses 2 as their respective secrets. Find Alice and Bobs D_H key?

6. With neat diagram explain the layers of OSI-ISO model.

7. Explain a use case were black box testing can be used.

8. Explain in detail the different types of cloud services.

9. Briefly describe the steps in the processing of Natural Language Processing.

10. Assume you have multiple files and each files contains two columns that represent the city and the corresponding temperature recorded in that city for the various measurement days. Explain how map reduce approach can be used to find the maximum temperature for each city across all of the data files.

11. Explain with an example how decision tree algorithm can be used for classification.

12. List some applications of Social network Analysis.

13. What is the importance of Deep learning algorithms?

14. Explain the concept of bias variance tradeoff in a Machine Learning Problem.

15. Write down the steps for converting a Non-deterministic finite automata into a Deterministic finite automata

——————— **(10 × 5 = 50 Marks)**