

Reg. No. :

Name :

Ph.D. ENTRANCE EXAMINATION, NOVEMBER 2022
FACULTY OF APPLIED SCIENCE AND TECHNOLOGY
COMPUTER SCIENCE

Time : 3 Hours

Max. Marks : 100

Instructions :

- 1) Answer **any ten** questions each from Section **A** and **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

Answer any **ten** questions. All Questions carry equal marks.

1. Explain the need of literature review for a good research.
2. Describe a method to select a research problem in your area/domain.
3. Explain the importance of referencing in technical reports.
4. What do you mean by ethical research? Explain.
5. Explain the significance of Intellectual Property Rights.
6. What are the practices to avoid plagiarism? Explain.
7. Explain any two sampling methods.

8. Develop a brief research plan in your area/domain.
9. Explain the relevance of data preprocessing.
10. What is Hypothesis? Explain the importance of Hypothesis in research.
11. Explain any two data processing strategies.
12. Write about the essential components of good research project proposal.
13. Explain in brief about impact factor and citation index.
14. Distinguish between Quantitative and Qualitative Research.
15. What is patent? Explain important patent laws.

(10 × 5 = 50 Marks)

Section – B

Computer Science

Answer any **ten** questions. All Questions carry equal marks.

1. Differentiate between Supervised and unsupervised training. Explain with suitable examples.
2. Explain Back propagation Artificial Neural Network.
3. Analyze the three mapping functions of cache memory.
4. Explain branching in instruction execution with example.
5. Explain any one of the error free compression techniques.
6. What is meant by image segmentation? Give an application of image segmentation.
7. Covert $A+(B*C-(D/E)*G)*H$ into postfix form showing stack status after every step in tabular form.

8. Show sorting of the following array elements using Heap Sort.
5,8,3,9,2,10,1,45,32.
9. Design DFA that accepts strings of 0's and 1's Containing 1101 as a substring.
10. What are the components required to design an IoT Device?
11. Kiran wants to send a mail to Geetha. Kiran is staying in India and Geetha is staying in New York. Both are connected to different mail servers. Which are the different types of agents involved in this process and explain the protocol used in the transfer of mail.
12. Explain how distributed data models and computing models differ from each other.
13. Given an array *arr* containing *N* words consisting of lowercase characters. Write a C/C++/Java/Python program to find the most frequent word in the array. If multiple words have same frequency, then print the word whose first occurrence occurs last in the array as compared to the other strings with same frequency.
14. Distinguish between Shortest Job First Scheduling and Round Robin Scheduling Algorithms. Consider the following set of processes, with the CPU burst time and arrival time:

Process	CPU burst time (milliseconds)	Arrival time
P1	10	3
P2	1	1
P3	2	2
P4	1	4
P5	5	5

Which algorithm among SJF and RR with time quantum = 2 milliseconds would give the minimum average waiting time for this set of processes? Justify.

15. Consider the following relation schema:

Works(Pname, Cname, salary)

Lives (Pname, Street, City)

located_in(Cname, Mgrname)

Write the SQL queries for the following

- (a) Find the names of all persons who live in the city "Bangalore".
- (b) Retrieve the names of all people of "TCS" whose salary is greater than Rs. 40000.
- (c) Find the names of all persons who live and work in the same city.
- (d) List the names of the persons who work for "Tech M" along with the cities they live in.
- (e) Find the average salary of "TCS" persons.

(10 × 5 = 50 Marks)
