1M2A24035 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2024

MCS2C01 - Design and Analysis of Algorithms

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

Part A

(Answer any FOUR questions, Each question carries 2 weightage)

1. What are the important characteristics of an algorithm?
2. What is your understanding about Travelling Salesman Problem?
3. What do you mean by dynamic programming?
4. What do mean by Parallel Prefix Computation?
5. Explain Big Omega Ratio Theorem.
6. What is the difference between Fractional Knapsack problem and (0/1) Knapsack Problem?
7. Define time complexity in the case of parallel algorithm.

(4 X 2 = 8 weightage)

Part B

(Answer any FOUR questions, Each question carries 3 weightage)

8. Write an algorithm to perform addition parallelly.
9. Given a set S = **{2, 4, 5}** and Weight = **6**. Find subset sum using backtracking approach.
10. What does the term "polynomial time" mean in the context of complexity classes?
11. Solve the recurrence **T(n) = T(2n/3) + 1** using Master Theorem.
12. Explain in detail about Algorithm Design Techniques.
13. How can we solve Knapsack problem using Branch-and-Bound technique?
14. Compute the time complexity of the following:

```
for i ← 99 to m-1
{
for j ← 100 to i
 {
  Set P ← P + Q[i][j]
 }
}
```

(4 X 3 = 12 weightage)

Part C

(Answer any TWO questions, Each question carries 5 weightage)

15. Prove that Hamiltonian cycle is **NP** Complete.

16. Solve the recurrence $\mathbf{T(n) = 2T(n/4) + \sqrt{n}}$

17. What is your understanding about parallel algorithms? Explain efficiency and scalability of parallel algorithm.

18. Explain the difference between Prim's algorithm and Kruskal's algorithm with the support of an example.

(2 X 5 = 10 weightage)

15

1M2A24036 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2024

MCS2C02 - Operating System Concepts

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any four questions. Each question carries 2 weightage

1. What is meant by 'Process descriptor'?
2. What is the use of multithreading?
3. Explain the term 'Concurrency'.
4. Briefly describe Overlays.
5. Explain Real Time OS.
6. What is the key difference between preemptive and non-preemptive memory scheduling algorithms?
7. What do you mean by 'buffer overflow attack'?

(4 x 2 = 8 weightage)

PART B

Answer any four questions. Each question carries 3 weightage

8. Discuss about evolution of Operating Systems.
9. Explain the concept of swapping.
10. What is the difference between logical address and physical address?
11. What are the causes of thrashing?
12. Explain multi level feedback queue scheduling.
13. Evaluate the merits and demerits of Virtual memory.
14. Write a note intrusion detection.

(4 x 3 = 12 weightage)

PART C

(Answer any two questions. Each question carries 5 weightage

15. Explain Producer Consumer problem and give a Semaphore solution for the same.
16. Explain about dynamic linking and dynamic loading.
17. Explain the scheduling methods used in Linux.
18. Briefly discuss the techniques to achieve Security.

(2 x 5 = 10 weightage)

16

1M2A24037 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2024

MCS2C03 - Computer Networks

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PARTA

Answer any four questions.
Each question carries two weightage

1. Explain various categories of computer network.
2. Describe the component of optical fiber cable.
3. Why IPV6 preferred over IPV4?
4. What is HTTP?
5. How congestion occur in computer network.
6. Distinguish between error detection and correction.
7. Describe operation of Firewalls.

(4x2=8weightage)

PART B

Answer any four questions.
Each question carries three weightage

8. Describe various computer network topology.
9. Explain web server and content distribution.
10. Explain multicast routine.
11. Explain the function of hubs and bridges.
12. Explain the functions of network layer.
13. Explain the goals of security in computer network.
14. What are the advantages of public key encryption.

(4x3=12weightage)

PARTC

Answer any two questions.
Each question carries five weightage

15. Discuss various guided and unguided transmission media.
16. Describe DNS socket programming.
17. Explain various multiple access protocols.
18. Explain the concept of user authentication and access control.

(2x5=10weightage)

17

1M2A24038 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2024

MCS2C04 - Data Analysis & Visualization using Python

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any *four* questions. Each question carries *2* weightage.

1. Differentiate structured and unstructured data.
2. What are the essential Knowledge Domains of Data Analysis
3. List data generation methods in python
4. Explain Features and Uses of Pandas
5. Differentiate Series and dataframes in pandas.
6. What are the indexing methods available in the NumPy array?
7. What is meant by array transpositions? Explain.

(4 x 2 = 8 Weightage)

PART B

Answer any *four* questions. Each question carries *3* weightage.

8. Explain the importance of data understanding and preprocessing in data analysis.
9. What are the common tasks performed during the data exploration process?
10. How to combine multiple Series with different indices? Explain.
11. Explain Lambda function and their uses. Give Examples.
12. Why is data generation important for data analysis?
13. Explain Map and Reduce functions in python.
14. Explain Common functions used for summary statistics.

(4 x 3 = 12 Weightage)

PART C

Answer any *two* questions. Each question carries *5* weightage.

15. List and explain Universal Array Functions in python.
16. Explain a) file handling in Python. b) Exception handling in Python.
17. Build a sample DataFrame from lists, dictionaries, arrays, or other data sources and explain any three indexing methods in pandas using this DataFrame.
18. Explain any three visualization functions in python.

(2 x 5 = 10 Weightage)

18

1M2A24039 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2024

MCS2C05 - Principles of software Engineering

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Questions 1 to 7. Answer any *four*. Each question carries *two* weightages.

1. Discuss the Incremental Model of software development.
2. Identify and briefly explain four types of requirements that may be defined for a computer-based system.
3. Explain the process of Requirements Validation.
4. Elaborate on the Cost Estimation with its limitations.
5. Explain Software Configuration.
6. Define Software Design Process. Explain the significance of it in Software Development.
7. Explain Product Standards.

PART B

Questions 9 to 14. Answer *any four*. Each question carries *three* weightages.

8. Illustrate the Change Control Process with a neat block diagram.
9. Recall various External non-functional requirements.
10. Illustrate the COCOMO Model of Estimation.
11. With a neat block diagram recall the steps involved in the project planning process.
12. Elaborate on Project Monitoring Plans.
13. Explain various Structural Models for Design.
14. Explain Defect Analysis and Prevention and the various techniques used.

PART C

Questions 15 to 18. Answer any *two*. Each question carries *five* weightages.

15. Elaborate on Version Management with its various types and key features.
16. a) Explain the term SRS and highlight its importance in software development. (2 wts)

    b) Articulate the term Refactoring in software design. (3 wts)
17. Explain the steps involved in the Incremental Coding Process with a neat block diagram.
18. Enumerate and explain various coding errors that can occur in common.