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1M2A23034 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2023

MCS2C01 – Design and Analysis of Algorithm

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any 4 questions. Each question carries 2 weightage

1. What are the important characteristics of an algorithm?
2. Define time complexity in the case of parallel algorithm.
3. Define Amdahl's Law?
4. Write a note on Nondeterministic Polynomial time algorithm.
5. What do mean by Parallel Prefix Computation?
6. Differentiate Direct Recursion and Indirect Recursion.
7. What do mean by Recursion Tree Method?

(4x2 = 8 weightage)

PART B

Answer any four questions. Each question carries 3 weightage

8. Explain PRAM model in detail.
9. Compute the runtime complexity of Merge sort algorithm.
10. How can we solve Knapsack problem using Branch-and-Bound technique?
11. Write a paragraph on substitution method used for solving recurrences.
12. What is the importance of amortized analysis?
13. Write a note on Nondeterministic Polynomial time algorithm.
14. Prove that the runtime complexity of merge sort in best case is $O(n \log n)$.

(4x3 = 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 $T(n) = 4T(n/2) + n^3$

17. Differentiate Kruskal's algorithm and Prim's algorithm. Explain with the support of an example.

18. Let **N(k)** be the number of multiplications in the following:

```
int Factorial( int k)
{
if (k = = 0)
then return 1
else
returnk* Factorial(k-1)
 }
```

Prove that **N(k) = k.**

(2x5 = 10 weightage)

IM2A23035 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2023

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. Explain various functions of operating systems .
2. Explain process descriptor.
3. Discuss hardware support for mutual exclusion.
4. Briefly describe Monitors in process scheduling.
5. Differentiate preemptive and non-preemptive type of algorithms.
6. List any two mobile OS and compare.
7. Describe about message passing.

(4 x 2 = 8)

PART B

Answer any four questions. Each question carries 3 weightage

8. What is Synchronization in OS? What are the different Synchronization mechanisms?
9. Explain about five state process model.
10. Explain Real Time OS.
11. Briefly discuss about demand paging.
12. Differentiate between paging and segmentation.
13. Explain Banker's algorithm with suitable example.
14. Write note on access control.

(4 x 3 = 12)

PART C

(Answer any two questions. Each question carries 5 weightage

15. Explain about Linux Process and Thread management.

16. Explain any two page replacement algorithms and find the page faults by simulating the algorithms using four frames.
    Consider the following page references : 1, 0, 1, 2, 0, 1, 2, 6, 2, 3, 0, 3, 2, 4 , 3, 6, 1, 7, 6, 3

17. Explain about Windows Memory Management.

18. Discuss about IOT OS.

(2 x 5 = 10)

1M2A23036 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2023

MCS2C03 – Computer Networks

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any four questions

Each question carries two weightage

1 Define Topology. List out different network topologies.

2 Give four examples of wired communication media.

3 Explain DNS with example.

4 What is a router?

5 List functions of a bridge.

6 Explain ARP.

7 Define firewalls.

(4x2=8 weightage)

PART B

Answer any four questions

Each question carries three weightage

8 Explain building a web server.

9 Write a short note on history of computer networking.

10 Distinguish between UDP and TCP.

11 Write a note on Internet Protocol Stack.

12 Differentiate connection-oriented and connectionless services.

13 Distinguish between hubs and switches.

14 Briefly explain principles of Cryptography.

(4x3=12 weightage)

PART C

Answer any two questions

Each question carries five weightage

15 Write an essay about ISO-OSI model.

16 Explain transport layer services.

17 Write an essay on error detection and correction.

18 What are the different security measures adopted in computer network?

(2x5=10weightage)

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1M2A23037 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2023

MCS2C04 – Data Analysis & Visualisation using Python

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any 4 Questions. Each carries 2 weightage.

1. Write a note on data structures in python.
2. Explain functions in Python?
3. Discuss structured data and unstructured data.
4. What do you mean by data understanding and preprocessing?
5. What is Pandas? Describe its features.
6. Describe array reduction operations provided by NumPy.
7. Differentiate list and tuple.

(4 x 2 = 8 Weightage)

PART B

Answer any 4 Questions. Each carries 3 weightage.

8. What is array transposition? Explain with an example.
9. With a suitable example explain any five universal functions in NumPy.
10. Define ranking in pandas. Explain the parameters of the rank() function with an example.
11. Explain lambda function with a suitable example.
12. What is EDA? Explain the steps involved in EDA.
13. Explain data analysis process.
14. Explain 3 array creation and initialization functions in python with examples.

(4 x 3 = 12 Weightage)

PART C

Answer any 2 Questions. Each carries 5 weightage.

15. Give the detailed explanation about the features and uses of pandas in python
16. Describe array indexing and slicing with suitable examples?
17. Discuss OOP in python. Implement a simple bank account class with deposit, withdraw and check balance methods.
18. Explain Data Visualization. Explain Matplotlib library in python. Explain how the Bar plot, Line plot , Scatter plots are created using Matplotlib.

(2 x 5 = 10 Weightage)

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1M2A23038 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Second Semester M.Sc Computer Science Degree Examination, April 2023

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. Define Software Engineering. List any two essential attributes of good software.
2. Elucidate the characteristics of a requirement.
3. Briefly describe the need for various types of plans in Software Project Development.
4. Differentiate the Top-down and Bottom-up approach of effort estimation.
5. Define Software Design Process. Explain the significance of it in Software Development.
6. Discuss the Fan In / Fan Out metric.
7. Explain Product Metrics.

PART B

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

8. Illustrate the Agile Process Model of Software Development with the support of a neat diagram.
9. Enumerate the techniques for Requirement Elicitation
10. Illustrate the COCOMO Model of Estimation.
11. Discuss various dimensions of Quality Software.
12. Elaborate the term Refactoring.
13. Explain cohesion with its various types.
14. Explain Error, Fault, and Failure and their impact on Software.

PART C

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

15. Illustrate the Change Control Process with a neat block diagram.
16. Recognize the structure of the Software Requirement Specification Document.
17. Describe how the Requirements Model can be translated into a Design Model with a Graphical representation.
18. Elucidate various Process and Product Standards.