

## FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024

## ADVANCED COMPUTER ARCHITECTURE

Time: 03 HOURS

Maximum Marks:50

## SECTION – A

1. Answer any FOUR of the following questions. 4×5=20
- a. Draw the sample General Register Organization with an example.
  - b. Describe the rules of overflow and underflow conditions.
  - c. Define plug-and-play. Describe USB architecture.
  - d. Elaborate the challenges in ILP
  - e. Describe the advantages of distributed-memory processor.

## SECTION – B

2. Answer any TWO of the following questions. 2×9=18
- a. Find the product of  $(00000100)_2$  and  $(00001011)_2$  using Booth's Algorithm.
  - b. Articulate thread-level parallelism with examples.
  - c. Explain the classes of cache coherence.

## SECTION – C

3. Answer the following question. 1×12=12
- a. i. Explain Data Manipulation Instructions with example. 06
  - ii. Appraise associative mapping in cache memory. 06

**FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024****STOCK MARKET OPERATIONS****Time: 03 HOURS****Maximum Marks: 50****SECTION – A**

- 1. Answer any FOUR of the following questions. 4×5=20**
- a. Explain the difference between investing and gambling in the context of the stock market.
  - b. Introduce the concept of derivatives.
  - c. Explain the concept of Indian Commodity Exchanges.
  - d. Evaluate the advantages and disadvantages of using technical analysis versus fundamental analysis in making investment decisions.
  - e. Explain the use of charts and oscillators in technical analysis.

**SECTION – B**

- 2. Answer any TWO of the following questions. 2×9=18**
- a. Outline the trading settlement procedure in the stock market. Also, elaborate on the role of SEBI.
  - b. Provide an introduction to mutual funds. Describe the operation flow chart, structure, and benefits of investing in mutual funds.
  - c. Identify and describe the participants in the foreign exchange market. How do their roles differ?

**SECTION – C**

- 3. Answer the following question. 12**
- a.
    - i. Evaluate the advantages and disadvantages of using technical analysis versus fundamental analysis in making investment decisions.
    - ii. Consider a scenario where an investor is deciding between investing in Forex and mutual funds. Evaluate the pros and cons of each option and recommend a suitable investment strategy based on the investor's risk profile.

## FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024

## FUNDAMENTALS OF CLOUD COMPUTING

Time: 03 HOURS

Maximum Marks:50

## SECTION – A

1. Answer any FOUR of the following questions.

4×5=20

- a. List out various characteristics of Parallel Computing.
- b. Summarize the primary responsibilities and obligations of a cloud provider in delivering cloud services to customers.
- c. Discuss about digital signature and its role in ensuring data integrity.
- d. Explain pay-per-use monitor, and the importance of cloud billing.
- e. Describe the role of load balancing in Dynamic Scalability Architecture.

## SECTION – B

2. Answer any TWO of the following questions.

2×9=18

- a. State the essential components of a distributed computing system. And explain how they interact to perform tasks efficiently.
- b. List the key considerations when selecting a cloud service provider for an enterprise.
- c. Describe the purpose of hashing in cloud security. How is hashing used to verify data integrity?

## SECTION – C

3. Answer the following question.

1×12=12

- a.
  - i. Discuss on hardware and software load balancers in cloud computing with the help of examples. 06
  - ii. Illustrate the various dynamic scaling methods with examples. 06



## FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024

## MATHEMATICAL FOUNDATION FOR COMPUTER APPLICATIONS

Time: 03 HOURS

Maximum Marks:50

## SECTION - A

1. Answer any FOUR of the following questions.

4×5=20

- a. Draw the Hasse diagram for divisibility on the set
- $\{1, 2, 3, 4, 5, 6, 7, 8\}$
  - $\{1, 2, 3, 5, 7, 11, 13\}$
  - $\{1, 2, 3, 6, 12, 24, 36, 48\}$
  - $\{1, 2, 4, 8, 16, 32, 64\}$
  - $\{1, 3, 9, 27, 81\}$
- b. Show that  $(p \wedge q) \rightarrow (p \vee q)$  is a tautology.
- c. Prove that for every positive integer  $n$ ,  $1 \cdot 2 + 2 \cdot 3 + \dots + n(n+1) = n(n+1)(n+2) / 3$  using mathematical induction.
- d. Find the inverse of following given matrix A.

$$A = \begin{pmatrix} 8 & 4 & -3 \\ 1 & 1 & 2 \\ 1 & 2 & 1 \end{pmatrix}$$

- e. Two unbiased coins are tossed simultaneously. Find the probability of getting
- Exactly one head
  - No tail
  - Two tails
  - Atleast one tail
  - Atmost one tail

## SECTION - B

2. Answer any TWO of the following questions.

2×9=18

- a. Let R be the relation on the set of ordered pairs of positive integers such that  $((a, b), (c, d)) \in R$  if and only if  $a + d = b + c$ . Show that R is an equivalence relation.
- b. Show that  $p \leftrightarrow q$  and  $\neg p \leftrightarrow \neg q$  are logically equivalent.
- c. Express the following system of equations in matrix form  $[A][X] = [B]$ , and then solve for  $[X]$ :
- $$\begin{aligned} 2x - 3y + z &= 7 \\ x + 2y - z &= 1 \\ 3x - y + 2z &= 6 \end{aligned}$$

## SECTION - C

3. Answer the following question.

1×12=12

- a. i. Find the solution to the recurrence relation  $a_n = -3a_{n-1} - 3a_{n-2} - a_{n-3}$  with initial conditions  $a_0 = 1$ ,  $a_1 = -2$ , and  $a_2 = -1$ . [6]
- ii. Of the students in a college, it is known that 60% reside in hostel and 40% are day scholars (not residing in hostel). Previous year results report that 30% of all students who reside in hostel attain A grade and 20% of day scholars attain A grade in their annual examination. At the end of the year, one student is chosen at random from the college and he has an A grade, what is the probability that the student is a hostler? [6]

## FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024

## DATA STRUCTURES

Time: 03 HOURS

Maximum Marks:50

## SECTION - A

1. Answer any FOUR of the following questions.

4×5=20

- Illustrate about Circular Linked List with an example. 1
- Explain the procedure for Push and Pop in Stack using Array. 2
- Distinguish between Binary Tree and Binary Search Tree with suitable examples. 3
- List any two properties of Heap. Describe the types of Heaps with examples. 4
- Differentiate 'Tree' from 'Graphs' data structures with examples. 5

## SECTION - B

2. Answer any TWO of the following questions.

2×9=18

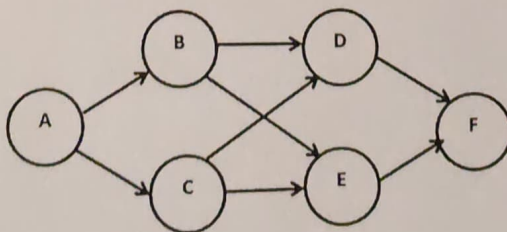
- Demonstrate Subtraction of two Polynomial Equations using Singly Linked List with suitable procedures. 1
- Describe about the Linked List representation of Simple Queues. 2
- Illustrate Hashing technique for the given inputs. 4  
Hash Table size: 10  
Input numbers: 10, 25, 33, 44, 12, 11, 36

## SECTION - C

3. Answer the following question.

1×12=12

- Create a Singly Linked List to store Movie details. 1  
Movie data fields are: MID, MOVIE\_NAME, REVIEW\_RATE [6]
  - Draw the DFS traversal order for the given input graph. 5 [6]



**FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024****ADVANCED OPERATING SYSTEMS**

Time: 03 HOURS

Maximum Marks:50

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**SECTION – A**

1. **Answer any FOUR of the following questions.** **4×5=20**
- a. Summarize the different types of System calls with examples.
  - b. Discuss about the basic Linux commands with examples.
  - c. Recall the various selection statements. Apply conditional statements to test if the variable NUM is between 90 and 100.
  - d. List out any five text editors available in Linux along with its features.
  - e. Discuss about the characteristics of deadlock.

**SECTION – B**

2. **Answer any TWO of the following questions.** **2×9=18**
- a. Outline about the Scheduler and Context Switching in OS.
  - b. Elaborate about the significance of 'Man Pages' in Linux.
  - c. Recall about the concepts of ParaVirtualization and Emulation.

**SECTION – C**

3. **Answer the following question.** **1×12=12**
- a.
    - i. Outline the structure of while statements. Write a shell script to find whether a given number is prime using a while loop. [6]
    - ii. Relate the capabilities of sed statements in pattern matching. [6]



## FIRST SEMESTER UNIVERSITY EXAMINATION, JANUARY 2024

## ADVANCED COMPUTER NETWORKS

Time: 03 HOURS

Maximum Marks:50

## SECTION - A

1. Answer any FOUR of the following questions.

4×5=20

- a. Define Switching. Why do we need switching? List the advantages and disadvantages of switching. 1
- b. Explain the IEEE 802.11 standard and its role in wireless LANs. 2
- c. Illustrate the Border Gateway Protocol. 3
- d. Write short notes on Multipurpose Internet Mail Extension. 4
- e. Why do we use IP Security? Explain briefly. 5

## SECTION - B

2. Answer any TWO of the following questions.

2×9=18

- a. Explain Star and Tree topologies with its advantages and disadvantages. 1
- b. Describe the basic operation of Bluetooth technology and its applications in short-range wireless communication. 2
- c. Explain the Routing Information Protocol with its packet format. 3

## SECTION - C

3. Answer the following question.

1×12=12

- a. i. Compare the mail access protocols POP and IMAP. 4 (6)
- ii. List and explain the types of HTTP connections. 4 (6)