

Reg. No. [REDACTED]

[23MCAC105 / 22MCAC105]

FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

ADVANCED COMPUTER ARCHITECTURE

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

Answer any FOUR of the following questions.

4x5=20

- Describe Direct and Indirect addressing modes with an example.
- Explain multiplication algorithm.
- Discuss types of arbitrations.
- Express static exploitation of ILP with examples.
- Appraise Flynn categories of parallel architectures.

SECTION - B

Answer any TWO of the following questions.

2x9=18

- Find the product of 12_{10} and -9_{10} using Booth's Algorithm.
- Briefly explain the data hazards and its solution.
- Explain the structure of centralized shared-memory multiprocessor with diagram.

SECTION - C

Answer the following question.

1x12=12

- i. Describe Register and its operations.
- ii. Define Cache memory. Describe it.

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make a statement on the security breach in the Lok Sabha.

The CPP Chairperson said that it took four days for the Prime Minister to

the aspirations of the people of Ladakh.

Ms. Gandhi also accused the government of "distorting history and twisting

the party's position that the women's reservation law must be implemented immediately and should cover women from the Other Backward Classes.

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[23MCAC102/22MCAC102]

FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

ADVANCED COMPUTER NETWORKS

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

$4 \times 5 = 20$

- Compare Simplex and Full-duplex transmission with its advantages and disadvantages.
- Explain the protocol which is required for discovering the MAC address using IP address.
- List and explain the services offered by the network layer.
- Draw UDP datagram format and explain its fields
- Discuss the role of Firewall in Network security.

SECTION - B

2. Answer any TWO of the following questions.

$2 \times 9 = 18$

- Explain Star and Tree topologies with its advantages and disadvantages.
- How is the Cyclic Redundancy Check method used for error detection? Explain with an appropriate example.
- Describe the role of the Network Layer in the OSI model with its primary responsibilities.

SECTION - C

3. Answer the following question.

$1 \times 12 = 12$

- i. Why do we need the FTP Protocol? Explain its types of connections. **06**
- ii. Explain the role of POP in email access. **06**

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FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

ADVANCED OPERATING SYSTEMS

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

$4 \times 5 = 20$

- a. Elaborate the need for Interprocess Communication in OS.
- b. Illustrate through examples about the file comparison commands in Linux.
- c. Interpret the various password management programs.
- d. Differentiate the Single process execution from Batch process execution.
- e. Interpret about Memory Management in virtual machines.

SECTION - B

2. Answer any TWO of the following questions.

$2 \times 9 = 18$

- a. Summarize the significance of operating system services.
- b. Implement the file manipulation commands in Linux for merging two files.
- c. Outline the significance of resource allocation graph towards detecting the deadlock situations.

SECTION - C

3. Answer the following question.

$1 \times 12 = 12$

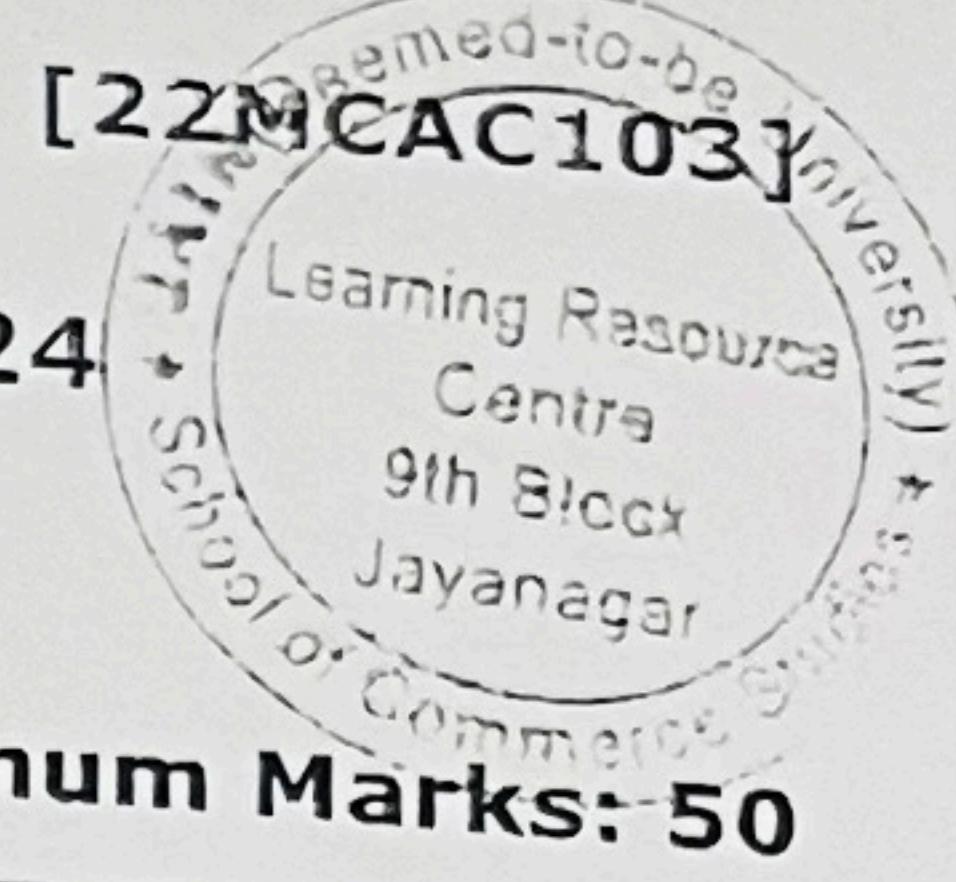
- a. i. Elaborate the various forms of user accounts to handle the task of protection.
Summarize various User Account Attributes. [6]
- ii. Write a shell script to validate the EMail addresses through Regular Expressions. [6]

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FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

ADVANCED OPERATING SYSTEMS USING LINUX

Time: 03 HOURS



Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

$4 \times 5 = 20$

- Explain with the diagram, how each process is represented in the operating system (PCB) and discuss the information each process holds.
- Discuss some advantages and disadvantages of the client-server model.
- Define conflict resolution. Which are the conflict resolution mechanisms provided by Linux to access certain hardware resources?
- What is a shell? How does the shell work? List out the standard shells used in Unix/Linux.
- What is pipe operator? Execute any two commands with pipe operator and write the output in new file called *Output.txt*.

SECTION - B

2. Answer any TWO of the following questions.

$2 \times 9 = 18$

- Elaborate on the operating system operations like dual mode and timer.
- Explain the types of task scheduling in a real-time system.
- Describe the different components of kernel modules like module management, driver registration and conflict resolution.

SECTION - C

3. Answer the following question.

12 Marks

- Explain the following commands with appropriate examples.
 - sed
 - head
 - tee
 - eval
 - script
 - pipe operator

($2 \times 6 = 12$)

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FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

ADVANCED SOFTWARE ENGINEERING

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

$4 \times 5 = 20$

- a. Illustrate any one type of evolutionary process model using an example.
- b. Explain the various Elements of Requirement Model in detail.
- c. Interpret Modularity from Design Concepts in Software Engineering.
- d. Explain Document Restructuring from Software Reengineering in detail.
- e. Elaborate on any three steps included in Strategies Approach to Software Testing.

SECTION - B

2. Answer any TWO of the following questions.

$2 \times 9 = 18$

- a. Describe Personal and Team Process models with a suitable example.
- b. Construct and Explain Collaboration Diagram for Library Management System.
- c. Elaborate the Unit & Integration Testing used in Object Oriented Software Test Strategies.

SECTION - C

3. Answer the following question.

$1 \times 12 = 12$

- a. i. Create and explain the Sequence Diagram for Bank Transaction System. 06
- ii. Elaborate the Software Supportability in detail with an example. 06

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[23MCAC101]

FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024

DATA STRUCTURES

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

4x5=20

- Explain the major operations that can be performed on all data structures.
- Write the algorithm for evaluation of a Postfix expression using Stack.
- Write an algorithm to perform in-order traversal of binary tree.
- Construct a Binary search tree by inserting numbers from 1 to 8.
- Discuss the procedure for detecting Cycles in an Undirected Graphs.

SECTION - B

2. Answer any TWO of the following questions.

2x9=18

- Write a program to perform searching in a Singly Linked List and display the element.
- Demonstrate Circular Queue using Array with its appropriate procedures.
- Define an AVL tree. Obtain an AVL tree by inserting one integer at a time in the following sequence. 150, 155, 160, 115, 110, 140, 120, 145, 130. Show all the steps.

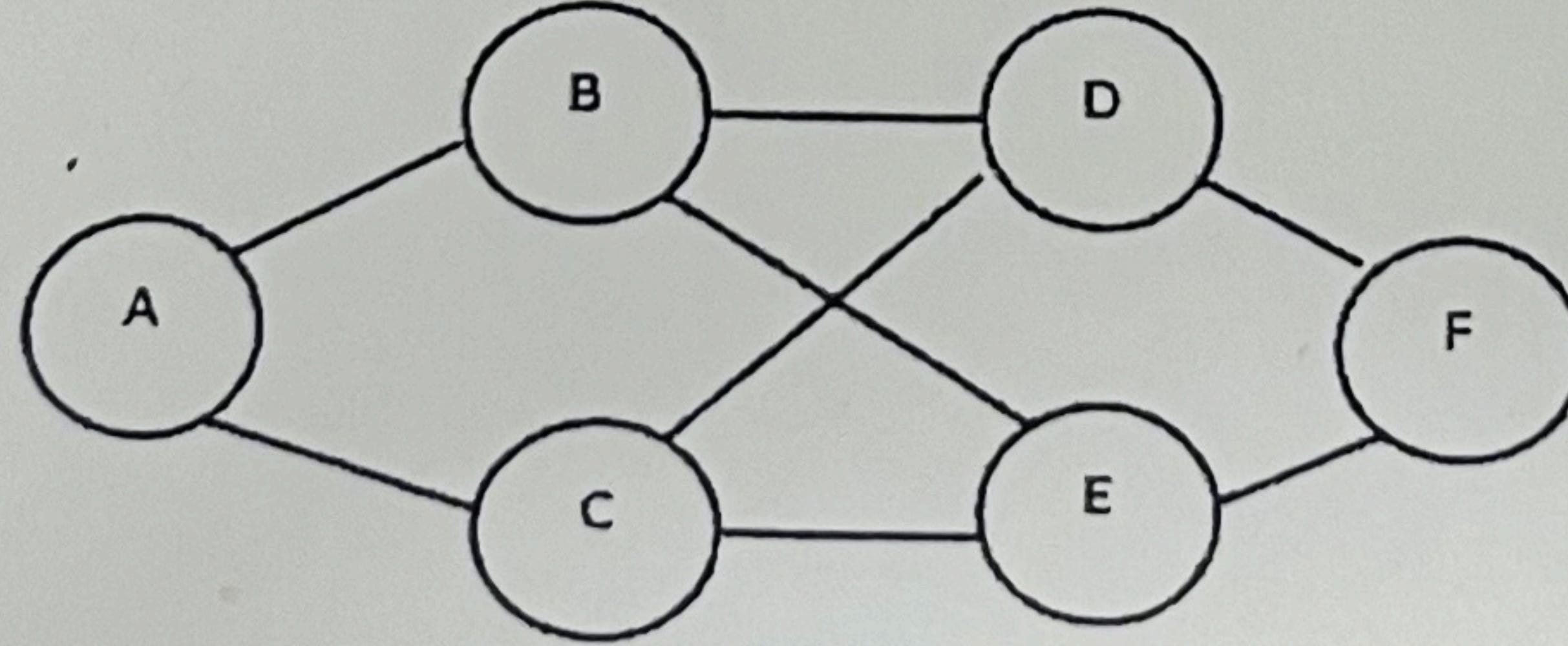
SECTION - C

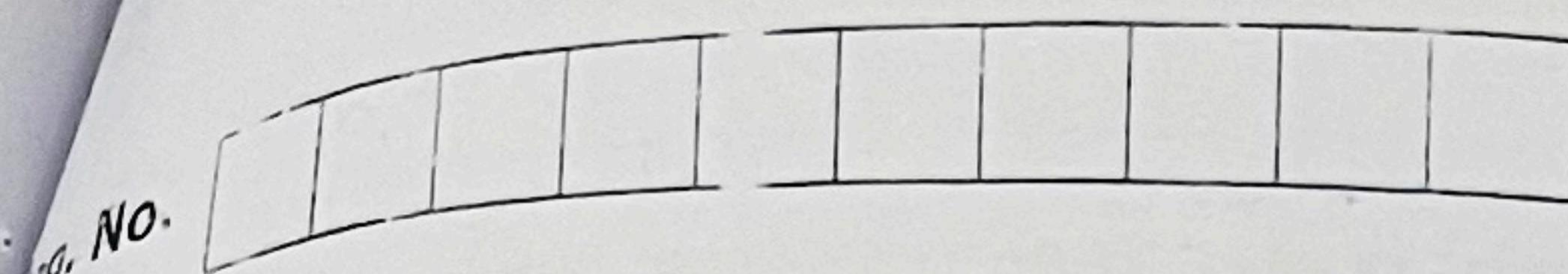
3. Answer the following question.

1x12=12

- i. Discuss the procedure of creating Sparse Matrix using Singly Linked List. 06
- ii. Simulate the nodes visiting order based on BFS traversal for the given Graph.

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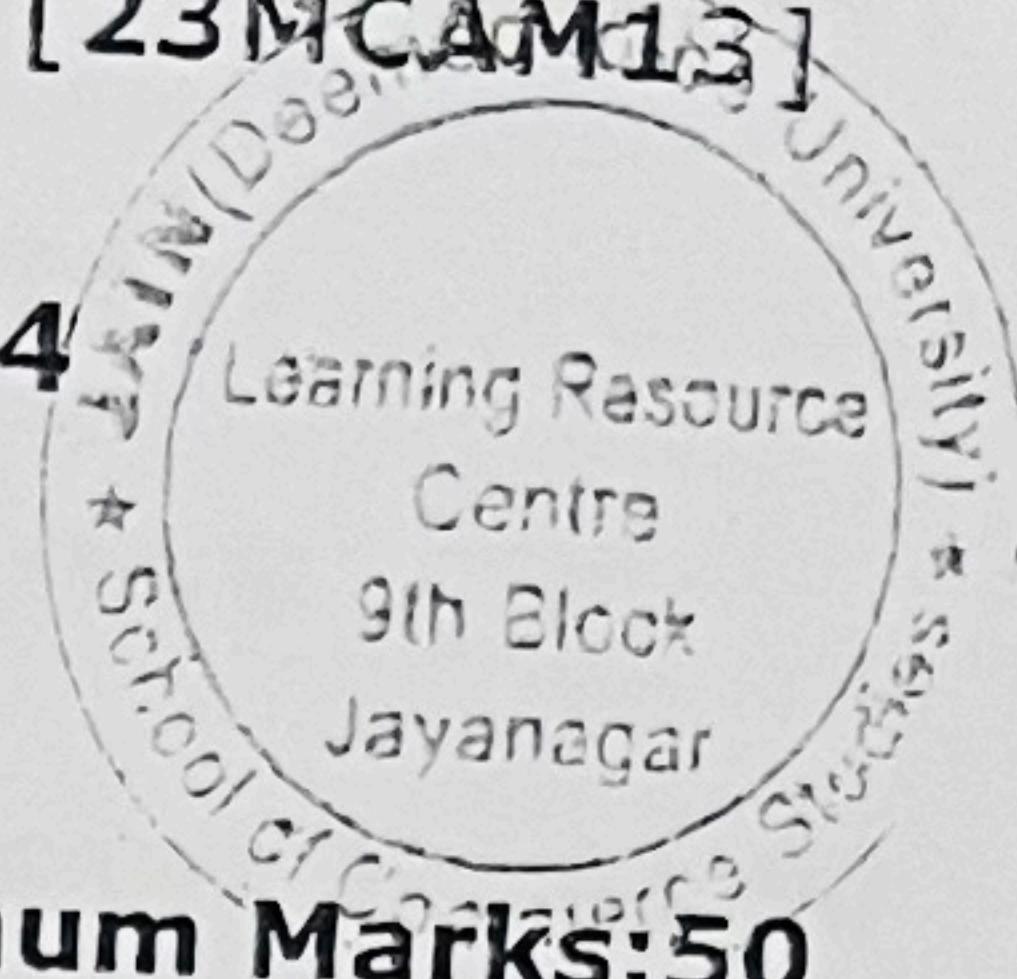




FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024
ESSENTIALS TO CYBER SECURITY

Time: 03 HOURS

[23MCAM13]



Maximum Marks: 50

SECTION - A

1. Answer any FOUR of the following questions.

4x5=20

- a. Explain cyber security in your own words.
- b. Describe the cyber security plan, and why it is important for organizations.
- c. Discuss about cyber law, and its significance in the digital age.
- d. Infer about spyware, and how it works to compromise user privacy.
- e. Explain the CIA Triad and its important in computer security.

SECTION - B

2. Answer any TWO of the following questions.

2x9=18

- a. Describe the key elements of a business continuity plan for a financial institution.
- b. Explain about human based social engineering with an example.
- c. Discuss the key differences between cyber terrorism and traditional terrorism.

SECTION - C

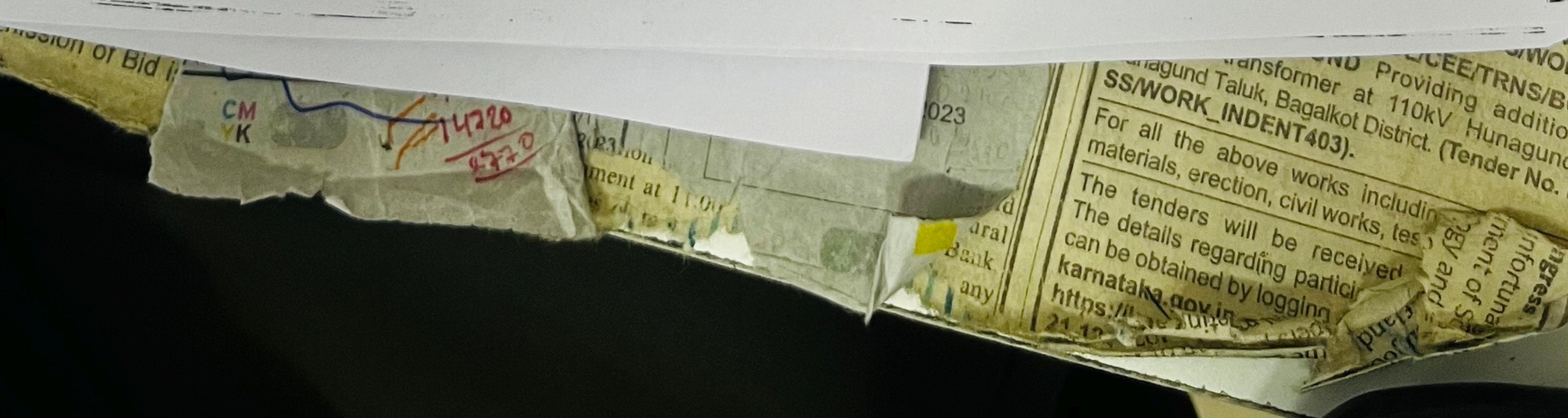
3. Answer the following question.

1x12=12

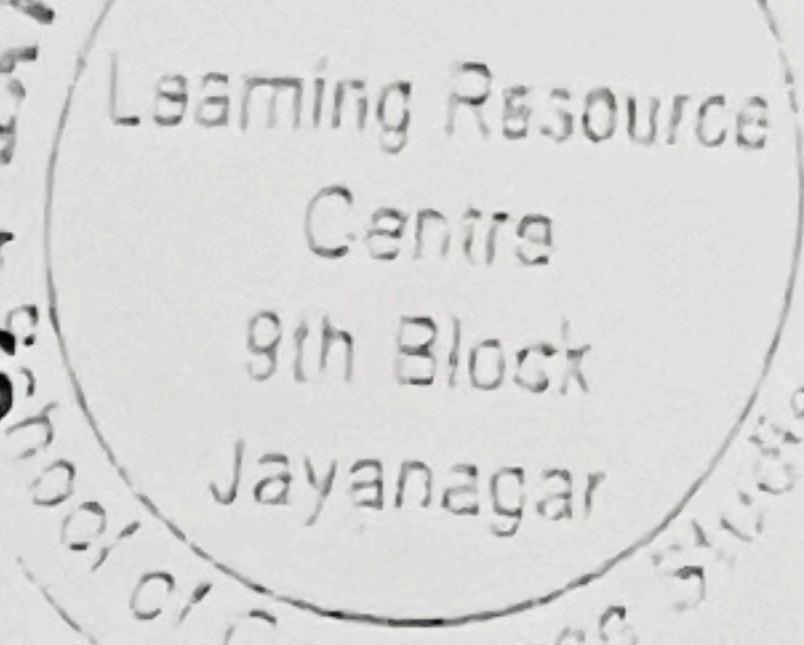
- a. i. Examine the ethical and legal challenges associated with the use of AI in cyberattacks.
- ii. Analyze the ethical and legal challenges associated with the use of AI in cyber defense.

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[23MCAC104]



FIRST SEMESTER UNIVERSITY EXAMINATION, JUNE 2024
MATHEMATICAL FOUNDATION FOR COMPUTER APPLICATIONS

Time: 03 HOURS

Maximum Marks: 50

SECTION - A

Answer any FOUR of the following questions.

4×5=20

- a. Determine whether each of these functions is a bijection from R to R.
 - i. $f(x) = -3x + 4$
 - ii. $f(x) = -3x^2 + 7$
- b. Use a direct proof to show that the product of two odd numbers is odd.
- c. How many positive integers not exceeding 100 are divisible either by 4 or by 6? Build the sets separately and find out.
- d. Discuss about homogeneous system of equations. Explain what are trivial solutions and non-trivial solutions with the help of an example.
- e. Two cards are drawn simultaneously (or successively without replacement) from a well shuffled pack of 52 cards. Find the mean, variance and standard deviation of the number of kings

SECTION - B

2. Answer any TWO of the following questions.

2×9=18

- a. Show that the relation R consisting of all pairs (x, y) such that x and y are bit strings of length three or more that agree in their first three bits is an equivalence relation on the set of all bit strings of length three or more. Also find all equivalence classes.
- b. Construct and prove Hypothetical Syllogism.
- c. Explain the fundamental operations on matrices, including addition, subtraction, scalar multiplication, matrix multiplication, and transpose. Provide real-world examples where these operations are applied.

SECTION - C

Answer the following question.

1×12=12

- a. i. Calculate the number of positive integers not exceeding 1000 that are not divisible by 3, 17, or 35. [6]
- ii. A person has undertaken a construction job. The probabilities are 0.65 that there will be strike, 0.80 that the construction job will be completed on time if there is no strike, and 0.32 that the construction job will be completed on time if there is a strike. Determine the probability that the construction job will be completed on time. [6]