

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

01. Objective type questions Attempt any 10 questions out of 12 given below.

(01 x 10 = 10)

- (i) Which of these is not a Java feature ?
 - (a) Object oriented
 - (b) Portable
 - (c) Platform dependent
 - (d) Robust
- (ii) Package is used to :
 - (a) Group related classes
 - (b) Store data
 - (c) Control loops
 - (d) Define constants
- (iii) Which class is the superclass of all exceptions ?
 - (a) Exception
 - (b) Throwable
 - (c) Error
 - (d) Runtime Exception
- (iv) Which package contains classes for networking :
 - (a) Java.io
 - (b) Java.net
 - (c) Java.util
 - (d) Java.awt
- (v) Which interface is used for event handling :
 - (a) ActionListener
 - (b) Runnable
 - (c) Serializable
 - (d) Eventobject
- (vi) Swing components are part of the package
- (vii) A establishes a connection between two computers.
- (viii) Multiple threads share the same.....
- (ix) Abstract methods do not have.....
- (x)converts Java code into byte code.
- (xi) Finally block executes only when exception occurs. (True/False)
- (xii) Datagram socket is used for UDP communication. (True/False)

(02)

Section-B

02. Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below. (3 x 3 = 09)

- (i) What is the role of Java Development Kit (JDK) ?
- (ii) Write short notes on access specifiers in Java.
- (iii) What is synchronization in multithreading ?
- (iv) What is a stream in Java I/O ?
- (v) What is a servlet ? Describe its cycle briefly.

Section-C

03. Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below. (6 x 3 = 18)

- (i) Explain the features of Java that make it platform independent.
- (ii) Explain the concept of dynamic method dispatch with an example.
- (iii) Explain how thread priorities and inter thread communication work.
- (iv) Explain the structure and working of TCP/IP protocol in Java networking.
- (v) What are AWT components ? Explain any five components in details.

Section-D

04. Long answer type questions (word limit – 500–600 words) Attempt any three questions out of five given below. (11 x 3 = 33)

- (i) Explain the difference between Java and C++ in terms of object oriented concepts, memory management and security.
- (ii) Explain how packages are created and used in Java. Discuss the concept of access specifiers in relation to packages.
- (iii) What are checked and unchecked exceptions ? How are custom exceptions created in Java ?
- (iv) What are networking classes in Java ? Explain InetAddress, URL, and socket classes with examples.
- (v) What is swing in Java ? compare swing with AWT and explain key swing components.

PGS-253022
Autonomous Examination Dec-2025
SEMESTER-III
M.Sc. (Computer Science)

Paper – II (Data Communication & Computer Networks)

Time : 3 Hours

M.M. : 70

Note: Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

01. Objective type questions Attempt any 10 questions out of 12 given below.
(1 x 10 = 10)

- (i) In OSI model, routing is performed by:-
 - (a) Network Layer (b) Data Link Layer
 - (c) Physical Layer (d) Session Layer
- (ii) Transmission media used for long distance communication:-
 - (a) Coaxial Cable (b) Optical Fiber
 - (b) Twisted Pair (d) Infrared
- (iii) Which Protocol is used for sending emails?
 - (a) FTP (b) SMTP
 - (c) HTTP (d) SNMP
- (iv) Which of the following uses the both symmetric and asymmetric cryptography?
 - (a) SSL (b) DNS
 - (c) SMTP (d) ARP
- (v) Which switching technique uses “Store and Forward” mechanism :-
 - (a) Circuit Switching (b) Message Switching
 - (c) Packet Switching (d) None
- (vi) The IP address 192.168.1.1 belongs to class.
- (vii) topology uses a single backbone cable.
- (viii) The logical address in the internet is
- (ix) In TCP, flow control is managed using mechanism.
- (x) In CRC, error detection is based on division.
- (xi) UDP provides reliable delivery. (True/False)
- (xii) Encryption is part of physical layer. (True/False)

(02)

Section-B

02. Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below.

(03 x 03= 09)

- (i) Differentiate between LAN, MAN and WAN.
- (ii) Explain error detection using parity check.
- (iii) Explain concept of subnets and their importance.
- (iv) Explain term congestion control in TCP?
- (v) Define cryptography and its types?

Section-C

03. Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below.

(06 x 03= 18)

- (i) Compare and contrast the OSI and TCP/IP reference models.
- (ii) Explain working of CSMA/CD and token ring protocols.
- (iii) Differentiate between unicast, multicast and broadcast communication.
- (iv) Explain three way handshake in TCP.
- (v) What is digital signature? Explain its working and significance.

Section-D

04. Long answer type questions (word limit – 500.600 words) Attempt any three questions out of five given below.

(11 x 03 = 33)

- (i) Explain the different network topologies and discuss their merits, demerits and application.
- (ii) Explain stop and wait ARQ and sliding window protocols with examples and timing diagram.
- (iii) What is routing? Explain distance Vector and Link state routing algorithm.
- (iv) Discuss the Quality of Service (QoS) requirements and how they are achieved in transport level.
- (v) Describe data encryption and decryption techniques and differentiate between symmetric and asymmetric cryptography.

PGS-253023
Autonomous Examination DEC– 2025
SEMESTER – III
M.Sc.(Computer Science)
Paper- III - (RDBMS)

Time – 03 Hours

M.M. :70

Note : Attempt all questions. Scheme of questions and marks are indicated against the questions.

Section-A

1. Objective type questions – Attempt any 10 questions out of 12 given below.

(1x10= 10)

- (i) Which of the following act as a repository of metadata?
(a) Data Mart (b) Data Dictionary
(c) Storage (d) Schema Folder
- (ii) In relational model, a row is also known as:
(a) Schema (b) Attribute
(c) Tuple (d) Field
- (iii) Tuple relational calculus is a :
(a) Procedural Query Language (b) Data Definition Language
(c) Non-Procedural Query Language (d) Data Control Language
- (iv) Third Normal Form removes:
(a) Partial Dependency (b) Multi-valued Dependency
(c) Transitive Dependency (d) All of the above
- (v) In DBMS architecture, the conceptual schema describes:
(a) Physical view (b) Logical view
(c) Both A and B (d) Neither (a) nor (b)
- (vi) **SELECT * from table;** perform:
(a) Grouping of rows (b) Filtering of rows
(c) Projections of all attribute (d) none of the above
- (vii) Which SQL statement is used to change table structure :
(a) ALTER (b) UPDATE
(c) Modify (d) SELECT
- (viii) Which of the following is a DDL command :
(a) CREATE (b) INSERT
(c) SELECT (d) WHERE
- (ix) The process of reducing data redundancy is known as.....
- (x) is used to remove duplicate rows from the result of a SELECT query.

(02)

- (xi) The **SELECT** clause in SQL corresponds to the **Projection(π)** operator in relational algebra. **(True / False)**
- (xii) The **WHERE** clause in SQL corresponds to the **Selection(σ)** operator in relational algebra. **(True / False)**

Section-B

2. Very Short answer type questions (word limit – 70-100 words) Attempt any Three questions out of Five given below. (03 x 03 = 09)

- (i) Define candidate key and Primary key.
- (ii) What is the difference among DROP, TRUNCATE, and DELETE commands?
- (iii) What is MS-Access?
- (iv) What is De-normalization?
- (v) Differentiate between Strong Entity and Weak Entity.

Section-C

3. Short answer type questions (word limit – 200-250 words) Attempt any Three questions out of Five given below. (06 x 03 = 18)

- (i) Explain the difference between File-oriented approach and Database-oriented approach.
- (ii) Explain the roles of Database Users and Database Administrators (DBA).
- (iii) Describe Relational Algebra and explain its various operators with their purposes.
- (iv) Explain Generalization, Specialization, and Aggregation with examples.
- (v) Create a SQL table named STUDENT with the following fields:

Roll_No (Primary Key), Name, Age, Address, Percentage.

Write SQL commands for the following:

- a) To create the STUDENT table.
- b) To insert sample records (at least 3 students) into the table.
- c) To display all the records stored in the STUDENT table.

Section-D

4. Long answer type questions (word limit – 500-600 words) Attempt any three questions out of five given below. (11 x 03 = 33)

- (i) Explain Normalization and its different normal forms — 1NF, 2NF, 3NF, and BCNF using suitable examples.

(03)

- (ii) Explain the Hierarchical, Network, and Relational data models with suitable examples.
- (iii) Explain Data Independence and describe the DBMS Architecture.
- (iv) Draw and explain the E–R Diagram for a College Management System showing entities, attributes, and relationships.

Entities and Attributes:

Student (Student_ID, Student_Name, Roll_No)

Department (Dept_ID, Dept_Name)

Teacher (Teacher_ID, Teacher_Name, Qualification)

Course (Course_ID, Course_Name, Credits)

Relationships:

Department – Teacher (1 : N)

Department – Student (1 : N)

Teacher – Course (1 : N)

Student – Course (M : N)

- (v) Consider the following relational schema:

DEPT (dept_id, dept_name)

COURSE (course_id, course_name, dept_id)

STUDENT (student_id, student_name, age, course_id, dept_id)

In this schema Primary keys are :dept_id, course_id, Student_id

Write the following queries in **Relational Algebra** as well as in **SQL**:

- a) List the names of students who belong to the Computer Science department.
- b) Find the names of students who have enrolled in the course 'DBMS'.
- c) List the student name along with their department name and course name.

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PGS-253024

Autonomous Examination Dec-2025

SEMESTER-III

M.Sc. - Computer Science

Paper-V (Artificial Intelligence and Expert System)

Time: 3 Hours

M.M: 70

Section-A

01. Objective type questions. Attempt any 10 questions out of 12 given below. (1×10 =10)

- (i) AI agent can interact with its environment by using____.
- (a) Only sensors
 - (b) Only perceivers
 - (c) Sensors and perceivers
 - (c) None of the above
- (ii) On which approach the face recognition system is based?
- (a) Applied AI Approach
 - (b) Cognitive AI Approach
 - (c) Strong AI Approach
 - (d) None of the above
- (iii) _____ strategy is also called as blind search.
- (a) Adversarial search (b) Uninformed search
 - (c) Informed search (d) Simple reflex search

(02)

- (iv) In a game tree, the optimal decision is found by-
- (a) Depth-first search
 - (b) Breadth-first search
 - (c) Minimax algorithm
 - (d) Greedy search
- (v) Partial-order planning is a classical planning approach that-
- (a) Requires a fixed sequence of actions
 - (b) Is only applicable to adversarial search
 - (c) Does not involve state-space search
 - (d) Allows flexibility in the order of actions
- (vi) _____was originally called ‘the Imitation game’.
- (vii) The existential quantifier in first-order logic is represented by_____.
- (viii) ANN stands for _____.
- (ix) A GPS navigation system is an example of_____ based intelligent agent.
- (x) Reinforcement learning provides two types of feedback- _____ and _____.
- (xi) Frames in Artificial Intelligence is derived from semantic nets. **(True/False)**
- (xii) Knowledge base is not a component of an Expert System. **(True/False)**

(03)

Section-B

02. Very Short answer type questions (word limit 70-100 words). Attempt any three questions out of five given below. (3×3=09)

- (i) What is PEAS in AI?
- (ii) Define Expert System.
- (iii) What is Heuristic?
- (iv) What do you mean by Knowledge Representation?
- (v) Give an example of Supervised Learning.

Section-C

03. Short answer type questions (word limit 200-250 words). Attempt any three questions out of five given below.

(6×3=18)

- (i) Write short notes on Propositional and Predicate Logic.
- (ii) Mention the applications of Artificial Intelligence.
- (iii) Differentiate between A* and AO* algorithm.
- (iv) Write about any one type of Planning in Artificial Intelligence.
- (v) Describe Prolog programming language with its syntax and backtracking operation.

(04)

Section-D

04. Long answer type questions (word limit 500-600 words). Attempt any three questions out of five given below.

(11×3=33)

- (i) Explain the problem solving technique in AI with example of Water Jug problem.
- (ii) Define Intelligent Agent. Explain the working of Model-based, Goal-based and Utility-based intelligent agents.
- (iii) What is Artificial Neural Network? Explain the concept of Single and Multi-Layer Perceptron with suitable diagram.
- (iv) Describe the functions of various components of Expert System.
- (v) Write notes on:
 - a) Hill Climbing algorithm
 - c) MYCIN & DENDRAL

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