R4610

Sub. Code
25MIT2C1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Information Technology

ADVANCED DBMS

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Mathematical process that reduces data redundancy (CO1, K2)

   (a) Programs

   (b) SQL Queries

   (c) Algorithm

   (d) Normalization

2. Structure that represents the logical view of the entire database (CO1, K2)

   (a) Schema

   (b) View

   (c) Skeleton

   (d) Relationship

3. ——— algebra is a procedural query language (CO2, K2)

(a) Irrelational

(b) Calculus

(c) Data Model

(d) Relational

4. Memories made to survive system crashes are (CO2, K2)

(a) Volatile storage

(b) Storage

(c) Non-volatile storage

(d) Network

5. Entities are represented by means of their properties, called (CO3, K2)

(a) Attributes

(b) Schema

(c) Structure

(d) Values

6. If alpha is a set of attributes and beta is subset of alpha, then alpha holds beta (CO3, K2)

(a) Trivial

(b) Reflexive Rule

(c) Transitivity Rule

(d) Non-Trivial

7. If a transaction executes all its operations successfully, it is said to be (CO4, K3)

(a) Active

(b) Committed

(c) Inactive

(d) Partial

8. To detect any deadlock situation in advance ——— is used (CO4, K1)

(a) Deadlock Prevention Mechanisms

(b) Deadlock Detection mechanisms

(c) Deadlock Avoidance Mechanisms

(d) Wait-Die Scheme

9. The document-based database is a (CO5, K1)

(a) Relational database

(b) Nonrelational database

(c) Document Database

(d) Nosql database

10. A data warehouse is constructed by integrating data from multiple ——— sources (CO5, K1)

(a) Homogeneous

(b) Database

(c) Metabase

(d) Heterogenous

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write the differences between File System and DBMS. (CO1, K2)

Or

(b) Write in detail about Data Models. (CO1, K2)

12. (a) Explain in detail about four operations of Relational Algebra with example. (CO2, K4)

Or

(b) Write about Tuple Relational Calculus with example. (CO2, K2)

13. (a) Explain : ER Model with example. (CO3, K4)

Or

(b) Explain about Functional Dependency (CO3, K4)

14. (a) Discuss about ACID Properties. (CO4, K3)

Or

(b) Explain in detail about Timestamp Ordering Protocol (CO4, K2)

15. (a) Write about types of Distributed Database Systems. (CO5, K4)

Or

(b) Write about types of NoSQL Database Systems with example. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Discuss about DBMS Architecture. (CO1, K2)

Or

(b) Discuss about Data Independence. (CO1, K2)

17. (a) Explain in detail about DBMS joins with example. (CO2, K4)

Or

(b) Write in detail about PL/SQL Procedures with example. (CO2, K2)

18. (a) Discuss about Schema Mapping. (CO3, K2)

Or

(b) Write in detail about BCNF with example. (CO3, K2)

19. (a) Explain about Lock based Protocols. (CO4, K4)

Or

(b) Explain in detail about Deadlock. (CO4, K4)

20. (a) Discuss about Big Data. (CO5, K2)

Or

(b) Discuss about Data Warhouse Architecture. (CO5, K2)

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R4611

Sub. Code
25MIT2C2

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Information Technology

MODERN OPERATING SYSTEM

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which of the following in NOT an operating system services? (CO1, K1)
   (a) Program execution
   (b) I/O operation
   (c) Compilation
   (d) Error detection

2. The data structure that stores information about a process is: (CO1, K1)
   (a) Stack
   (b) PCB
   (c) Heap
   (d) Page table

3. Which scheduling algorithm may cause starvation? (CO2, K2)

(a) FCFS

(b) Round Robin

(c) Priority scheduling

(d) SJF

4. Semaphore is mainly used for (CO2, K2)

(a) Memory management

(b) Synchronization

(c) Deadlock prevention

(d) Paging

5. The page replacement algorithm that yields the minimum number of page faults is (CO3, K2)

(a) FIFO

(b) LRU

(c) Optimal

(d) Clock

6. Segmentation is based on (CO3, K2)

(a) Fixed-size blocks

(b) Logical divisions

(c) Physical memory size

(d) Disk blocks

7. Which file system is commonly used in Linux? (CO4, K1)

(a) FAT

(b) NTFS

(c) ext4

(d) HFS+

8. Spooling is associated with (CO4, K2)

(a) CPU scheduling

(b) Memory allocation

(c) I/O management

(d) File protection

9. Which technology enables OS-level virtualization (CO5, K2)

(a) Virtual machines

(b) Containers

(c) Paging

(d) Scheduling

10. Authentication is used to (CO5, K2)

(a) Grant permissions

(b) Identify users

(c) Encrypt files

(d) Monitor processes

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Explain the functions of an operating system. (CO1, K2)

Or

(b) Discuss the role of PCB in process management. (CO1, K3)

12. (a) Explain inter-process communication mechanisms in detail. (CO2, K4)

Or

(b) Describe mutex and semaphore mechanisms. (CO2, K2)

13. (a) Describe demand paging mechanism. (CO3, K3)

Or

(b) Explain thrashing and discuss techniques to control it. (CO3, K3)

14. (a) Explain file system implementation methods. (CO4, K2)

Or

(b) Describe device drivers and their functions (CO4, K2)

15. (a) Describe access control models. (CO5, K3)

Or

(b) Compare Linux and Windows operating systems. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain OS architecture and system calls in detail. (CO1, K4)

Or

(b) Analyze multiprocessing systems and their advantages. (CO1, K4)

17. (a) Compare any three CPU scheduling algorithms with merits and demerits. (CO2, K4)

Or

(b) Explain IPC mechanisms with examples. (CO2, K3)

18. (a) Explain memory allocation techniques in detail. (CO3, K4)

Or

(b) Evaluate different page replacement algorithms and compare their performance. (CO3, K6)

19. (a) Explain I/O system design and its components. (CO4, K4)

Or

(b) Discuss storage virtualization and modern storage devices. (CO4, K4)

20. (a) Explain OS security threats and protection mechanisms. (CO5, K4)

Or

(b) Evaluate container-based virtualization and virtual machines. (CO5, K6)

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R4612	Sub. Code
	25MIT2C3

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Information Technology

COMPUTER NETWORK AND SECURITY

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** questions by choosing the correct option.

1. How many layers are there in the ISO OSI reference model? (CO1, K2)

   (a) 7

   (b) 5

   (c) 4

   (d) 6

2. Which layer does the data link layer take packets from and encapsulate them into frames for transmission? (CO1, K2)

   (a) transport layer

   (b) application layer

   (c) network layer

   (d) physical layer

3. Which of the following maintains the Domain Name System? (CO2, K2)

(a) a single server

(b) a single computer

(c) distributed database system

(d) none of the mentioned

4. What is the term for the data communication system within a building or campus? (CO2, K2)

(a) MAN

(b) LAN

(c) PAN

(d) WAN

5. VPN is abbreviation of (CO3, K2)

(a) Visual Private Network

(b) Virtual Protocol Network

(c) Virtual Private Network

(d) Virtual Protocol Networking

6. A firewall is installed at the point where the secure internal network and untrusted external network meet which is also known as _____ (CO3, K2)

(a) Chock point

(b) Meeting point

(c) Firewall point

(d) Secure point

7. Site-to-site VPNs are also known as _____ (CO4, K2)

(a) Switch-to-switch VPNs

(b) Peer-to-Peer VPNs

(c) Point-to-point VPNs

(d) Router-to-router VPNs

8. Which type of malware locks a user's data and demands payment for access? (CO4, K2)

(a) Virus

(b) Worm

(c) Ransomware

(d) Spyware

9. What is the primary role of a firewall in a network? (CO5, K2)

(a) To filter and regulate network traffic

(b) To store critical system logs

(c) To develop secure applications

(d) To encrypt user credentials

10. Which protocol is commonly used to secure web communication? (CO5, K2)

(a) FTP

(b) HTTP

(c) HTTPS

(d) SMTP

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) What is a network topology? Explain. (CO1, K2)

Or

(b) Discuss the message switching network. (CO1, K2)

12. (a) What are the advantages of bandwidth? Explain. (CO2, K2)

Or

(b) What is the main advantage of using DHCP? Explain. (CO2, K2)

13. (a) Explain Distance Vector Routing Protocol. (CO3, K2)

Or

(b) Discuss the connection establishment mechanism in TCP. (CO3, K2)

14. (a) What is meant by symmetric cryptography? Explain. (CO4, K2)

Or

(b) Explain the security goals in cryptography. (CO4, K4)

15. (a) Discuss the types of malwares. (CO5, K2)

Or

(b) Explain the cyber security policies and procedures. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain OSI model in detail. (CO1, K4)

Or

(b) Discuss transmission media in compute networks. (CO1, K2)

17. (a) Discuss the ICMP protocol message format. (CO2, K2)

Or

(b) Explain the analog and digital signal in data communication. (CO2, K4)

18. (a) Discuss the purpose of dynamic routing. (CO3, K2)

Or

(b) Explain error and flow control in transport layer. (CO3, K4)

19. (a) What is the main use of a firewall? Explain. (CO4, K2)

Or

(b) What is tunneling in network security? Explain. (CO4, K2)

20. (a) Explain the network threats and attacks. (CO5, K4)

Or

(b) Discuss the types of network access control. (CO5, K2)

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25MIT2E1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Information Technology

Elective – INTERNET OF THINGS

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Each IoT device has a unique identity and unique identifier (CO1, K2)

   (a) IP Address (b) IP Address and URI

   (c) URI (d) Zigbee

2. Data Modelling Language used to model configuration (CO1, K2)

   (a) SMNP (b) M2M

   (c) YANG (d) MQTT

3. OGC stands for (CO2, K2)

   (a) Open Geospatial Consortium

   (b) Observation Geospatial Consortium

   (c) Oriented Geospatial Consortium

   (d) Opened Geospatial Consortium

4. Connection used in M2M is (CO2, K2)

(a) HTTP (b) HTTPS

(c) P2P (d) Network

5. To monitor and control industrial processes (CO3, K2)

(a) SCADA (b) ETSI

(c) M2M (d) OGC

6. Specialized web transfer protocol useful for M2M applications. (CO3, K2)

(a) HTML (b) LAN

(c) Javascript (d) CoAP

7. Python _____ module is used to send e-mail. (CO4, K2)

(a) SMTP (b) Python

(c) HTML (d) smtplib

8. An Arduino pin compatible single board mini computer. (CO4, K2)

(a) Linux (b) Raspberry

(c) pcDuino (d) Python

9. Data Analytics is used to make cities smarter by analysing (CO5, K2)

(a) Traffic Patterns (b) Energy usage

(c) Air Quality (d) All of the above

10. The Operating System commonly used in lot platforms is (CO5, K2)

(a) Linux (b) Windows 11

(c) UNIX (d) Embedded Linux

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Write in detail about IoT Protocols. (CO1, K2)

Or

(b) Write the characteristics of IoT. (CO1, K2)

12. (a) Write about IoT Platform Design Methodology. (CO2, K2)

Or

(b) Write in detail about IoT Functional Model. (CO2, K2)

13. (a) Explain about SCADA Protocol. (CO3, K4)

Or

(b) Explain about 6LowPAN. (CO3, K4)

14. (a) Discuss about IoT Systems. (CO4, K2)

Or

(b) Explain in detail about IoT Devices. (CO4, K4)

15. (a) Write about Asset Management. (CO5, K2)

Or

(b) Write about Industrial Automation with examples. (CO5, K2)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Discuss about IoT Enabling Technologies. (CO1, K2)

Or

(b) Discuss about IoT systems management with NETCONF-YANG. (CO1, K2)

17. (a) Explain in detail about ETSI Architecture. (CO2, K2)

Or

(b) Write in detail about OGC Architecture. (CO2, K2)

18. (a) Discuss about BACNet Protocol. (CO3, K2)

Or

(b) Write in detail about CoAP. (CO3, K2)

19. (a) Explain about Raspberry Pi board. (CO4, K2)

Or

(b) Explain in detail about Arduino. (CO4, K2)

20. (a) Discuss about Data Analytics for IoT. (CO5, K2)

Or

(b) Discuss about Management Tools for IoT. (CO5, K2)

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R4614

Sub. Code
25MIT2S1

M.Sc. DEGREE EXAMINATION, APRIL – 2026

Second Semester

Information Technology

CLOUD COMPUTING

(CBCS – 2025 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Cloud computing provides resources through (CO1, K2)

   (a) Fixed pricing

   (b) On-demand services

   (c) Dedicated servers

   (d) Manual provisioning

2. Hybrid cloud is a combination of (CO1, K2)

   (a) Public and private clouds

   (b) Public and community clouds

   (c) Private and community clouds

   (d) Grid and cloud

3. PaaS mainly supports (CO2, K2)

(a) Application development

(b) Network management

(c) Hardware provisioning

(d) Storage management

4. Which virtualization uses full hardware emulation? (CO2, K1)

(a) Para-virtualization

(b) Full virtualization

(c) OS virtualization

(d) Containerization

5. Google Cloud Storage is an example of (CO3, K2)

(a) File storage

(b) Object storage

(c) Block storage

(d) Cache

6. NoSQL databases are best suited for (CO3, K2)

(a) Small data

(b) High scalability

(c) Fixed schema

(d) Single user

7. Firewalls are used to (CO4, K2)

(a) Encrypt data

(b) Monitor users

(c) Control network access

(d) Backup data

8. HIPAA is mainly related to (CO4, K2)

(a) Financial data

(b) Health data

(c) Educational data

(d) Government data

9. Azure Functions belongs to (CO5, K2)

(a) SaaS

(b) PaaS

(c) FaaS

(d) IaaS

10. Kubernetes is used for (CO5, K2)

(a) Monitoring

(b) Container orchestration

(c) Virtualization

(d) Load testing

Part B (5 × 5 = 25)

Answer **all** questions not more than 500 words each.

11. (a) Define cloud computing and explain its key features. (CO1, K3)

Or

(b) Describe the evolution and history of cloud computing. (CO1, K4)

12. (a) Explain Infrastructure as a Service (IaaS) with examples. (CO2, K4)

Or

(b) Differentiate between full virtualization and para-virtualization. (CO2, K5)

13. (a) Explain cloud storage basics and list the advantages of cloud storage. (CO3, K5)

Or

(b) Write short notes on NoSQL databases used in cloud environments. (CO3, K3)

14. (a) List and explain major cloud security threats. (CO4, K5)

Or

(b) Explain Identity and Access Management in cloud computing. (CO4, K4)

15. (a) What is serverless computing? Explain Function-as-a-Service (FaaS). (CO5, K4)

Or

(b) Write short notes on Docker and Kubernetes. (CO5, K3)

Part C (5 × 8 = 40)

Answer **all** questions not more than 1000 words each.

16. (a) Explain cloud architecture components in detail with a neat diagram. (CO1, K4)

Or

(b) Compare public, private, hybrid and community cloud deployment models. (CO1, K5)

17. (a) Explain PaaS and SaaS with suitable examples and use cases. (CO2, K4)

Or

(b) Describe virtualization in cloud computing and the role of hypervisors in detail. (CO2, K5)

18. (a) Describe cloud-based data storage and handling methods in cloud computing. (CO3, K4)

Or

(b) Discuss data management and migration techniques in cloud environments. (CO3, K5)

19. (a) Explain encryption techniques used in cloud computing and describe the role of firewalls in securing cloud environments. (CO4, K5)

Or

(b) Discuss the importance of ISO and NIST compliance standards in cloud computing. (CO4, K4)

20. (a) Explain the core services and features of major cloud platforms such as Microsoft Azure and Google Cloud Platform. (CO5, K4)

Or

(b) Discuss the use of cloud computing in one real-world domain such as healthcare, Finance or smart cities. (CO5, K5)

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