

RDBMS CONCEPT AND COMPUTER NETWORKING
(CSEN 3207)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group - A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Which topology requires a central controller or hub?
(a) Mesh (b) Star (c) Bus (d) Ring.
- (ii) View is a
(a) Temporary table (b) Virtual table
(c) Permanent table (d) SQL statement.
- (iii) Connecting two or more networks to form a single network is called
(a) Internetworking (b) Intranetworking
(c) Interconnecting (d) Intraconnectivity.
- (iv) Redundancy is dangerous as it is potential threat to data
(a) integrity (b) consistency
(c) sufficiency (d) none of these.
- (v) The _____ layer handles the creation of data frames.
(a) physical (b) network
(c) transport (d) data link
- (vi) In OSI model, as a data packet moves from the lower to the upper layers, the headers are _____
(a) added (b) removed
(c) randomized (d) rearranged.
- (vii) An attribute of one table matching the primary key of another table is called
(a) foreign key (b) super key
(c) composite key (d) secondary key.
- (viii) WAN stands for
(a) Web Access Network (b) World Area Network
(c) Wide Area Network (d) Web Area Network.

- (ix) Communication takes places in both direction but one at a time is called
(a) full duplex (b) half duplex
(c) simplex (d) none of these.
- (x) Given the functional dependencies: $X \rightarrow W$, $X \rightarrow Y$, $Y \rightarrow Z$, $Z \rightarrow PQ$. Which of the following does not hold true?
(a) $X \rightarrow Z$ (b) $W \rightarrow Z$ (c) $X \rightarrow WY$ (d) None of these.

Group- B

2. (a) Describe the three levels of data abstraction of a database system with suitable diagram(s). [(CO1)(Understand/LOCQ)]
(b) What is a DBA? How does a DBA play an important role in a database system? [(CO1)(Remember/LOCQ)]
6 + (2 + 4) = 12
3. (a) Given relational schema where the underlined attributes are the primary keys:
Sailors (sid, sname, rating, age)
Reserves (sid, bid, date)
Boats (bid, bname, color)
Write the following queries using Relational Algebra:
i) Find the id(sid) names (sname) of sailors who have reserved boat with boat id (bid) 10074.
ii) Find the id, names of sailors and boat names (bname) for those who have reserved a red boat or a green boat.
iii) Find names of sailor(s) who have reserved a blue boat on 10 April, 2022. [(CO3)(Evaluate/HOCQ)]
(b) Define the following with suitable examples:
(i) Discriminator (ii) One-to-Many cardinality (iii) Derived attribute [(CO2)(Understand/LOCQ)]
(3 × 2) + (3 × 2) = 12

Group - C

4. (a) Explain 2 phase locking protocol. [(CO4)(Understand/LOCQ)]
(b) Draw the state diagram of transaction and describe different states. [(CO1,CO4)(Understand/LOCQ)]
(c) Explain the terms 'partial functional dependency'. [(CO1,CO4)(Remember/LOCQ)]
4 + 6 + 2 = 12
5. (a) Explain 'Dirty read' problem with suitable example. [(CO4)(Apply, Understand/IOCQ)]
(b) What are the ACID properties of a transaction? [(CO4)(Understand/LOCQ)]
(c) Compare BCNF and 3NF. [(CO4)(Understand/LOCQ)]
5 + 4 + 3 = 12

Group - D

6. (a) Write down the advantages of mesh and star topology. [CO5(Understand/LOCQ)]
 (b) What are the functions provided by Data Link layer, Physical link Layer and Network Layer in the OSI model? [CO5(Understand/LOCQ)]
 (c) Compare LAN and WAN. [CO5(Understand, Analyze/IOCQ)]
(2 + 2) + (2 + 2 + 2) + 2 = 12
7. (a) Compare guided and unguided media. [(CO5)(Understand, Analyze/IOCQ)]
 (b) Explain with example: simplex, half-duplex and full duplex communications. [(CO5)(Understand/LOCQ)]
 (c) In perspective of computer network, what are the most important network criteria? Briefly explain them. [(CO5)(Understand/LOCQ)]
3 + 4 + 5 = 12

Group - E

8. (a) The website address of our college is www.heritageit.edu. Explain. Briefly each and every component of the web address. [(CO6)(Design, Understand/HOCQ)]
 (b) You are sending an e-mail to your friend over the Internet. Explain step by step, with the help of a diagram how your mail will be received by your friend. [(CO6)(Design, Understand/HOCQ)]
3 + 9 = 12
9. (a) Write short notes on the following: (any three): **(3 × 4) = 12**
 (i) Packet switching and circuit switching
 (ii) URL
 (iii) Search Engine
 (iv) Different documents in WWW. [(CO6)(Understand/LOCQ)]

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	70.83	10.42	18.75

Course Outcome (CO):

After completing the course, the students will be able to:

1. Identify the characteristics of a database and describe the architecture and languages of relational Database Management System.
2. Understand & analyze design principles for logical design of databases, including the E-R model and apply the concepts of normalization to design an optimal database.
3. Apply relational database theory, and be able to write relational algebra expressions for queries and apply the concepts to manage a database using SQL.

4. Understand the concept of database transaction, its properties and the concept called serializability.
5. Understand the topology, transmission mode of computer networks and explains key networking protocols in the context of a conceptual model, such as the OSI and TCP/IP framework.
6. Understand the basic workings of Inter networking, WWW, search engine and e-mail in the context of data communication.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question