

**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) The overall design of a database is called
 - (a) Schema of the database
 - (b) Structure of the database
 - (c) The screen of the database
 - (d) View of the database.
 - (ii) The level of data abstraction which describes how the data is actually stored is
 - (a) Physical level
 - (b) Storage level
 - (c) Conceptual level
 - (d) View level
 - (iii) Which of the following is not a proper state of transaction?
 - (a) Partially aborted
 - (b) Partially committed
 - (c) Failed
 - (d) Committed.
 - (iv) Which of the following is not a property of transactions?
 - (a) Atomicity
 - (b) Concurrency
 - (c) Isolation
 - (d) Durability.
 - (v) One limitation of E-R model is that it cannot
 - (a) Use generalization
 - (b) Use single primary key
 - (c) Express relationship among relationships
 - (d) None of the above.
 - (vi) Specialization is a _____ design process.
 - (a) Bottom up
 - (b) Top down
 - (c) Both (a) & (b)
 - (d) None of these.
 - (vii) A company is converting a cabled LAN to a wireless Ethernet LAN. What must be changed on every host on the network?
 - (a) Each host will require a new IP address
 - (b) Each host will require that the operating system be upgraded
 - (c) Each host will require an appropriate NIC or Adapter
 - (d) No changes required.

- (viii) An Ethernet Network is an example of which type of network?
(a) Circuit-switched (b) Packet-switched
(c) Message-switched (d) None of these.
- (ix) In the OSI model, which layer is responsible for breaking the data into smaller packets, so that if any packet is lost during transmission, the missing packets will be sent again.
(a) Data Link Layer (b) Transport Layer
(c) Network Layer (d) Session Layer
- (x) A Telephone Network is an example of _____ mode communication.
(a) Automatic (b) Half-duplex (c) Full-duplex (d) Simplex.

Group – B

2. (a) Which one is the most important component of Storage Manager functionality of a database systems and why?
- (b) What role does DML compiler play in Query Processor functionality of a database systems?
- (c) What is physical and logical data independence? How are they ensured by the ANSI-SPARC three-tier architecture?

3 + 3 + 6 = 12

3. (a) In the state of Orisha, the state government wishes to build a DBMS for tourism department. The information consists of monuments of tourist interest, their location and history. Monuments are classified according to historical, religious and architectural importance. The list of facilities available at each spot is (i) living accommodation in terms of hotels, their names, category and the number of rooms available and (ii) local transport facilities in terms of service provider name, tours with their tariff and timing. Draw an ER diagram by identifying entities, relationships, attributes, primary keys.
- (b) Consider the schema:-
Airport (code, name, city, country)
Flight (number, airline, from_airport_code, to_airport_code)
Reservation(flight_number, seat_number, date, passenger_name)
Answer the following using Relational Algebra
(i) All the flight information for Indian Airlines and Jet Airways
(ii) List the passenger who are on flight number 'SA 747'
(iii) List the airline names which fly from Kolkata and Chennai

6 + (2 + 1 + 3) = 12

Group – C

4. (a) Explain with example what do you understand by updation and deletion data anomaly?

- (b) We have the following table from a student database of a university:-
StudentProgressReport (StudentID, StudName, Stream, CourseID, CourseName, FacultyID, FacultyName, FacultyLocation, Marks)
The following FDs are listed below:-
FD1: StudentID \rightarrow StudName, Stream
FD2: CourseID \rightarrow CourseName
FD3: StudentID, CourseID \rightarrow Marks
FD4: FacultyID \rightarrow FacultyName, FacultyLocation

Normalize the above table step by step upto 3NF. Must mention the Primary key of every table. In each step mention the data anomalies that may occur.

(2 + 2) + 8 = 12

5. (a) Explain with examples, The Lost Update problem and Dirty Read problem.
(b) Which of the following schedule is conflict serializable? Explain your answer. For each serializable schedule, determine the equivalent serial schedule.
(i) r1(x); r3(x); w1(x); r2(x); w3(x);
(ii) r3(x); r2(x); w3(x); r1(x); w1(x);

(3 + 3) + 6 = 12

Group – D

6. (a) What are the main functions of Application, Network and Transport layers of TCP/IP model?
(b) What are the basic differences between Amplifier and Repeater?
(c) Compare half duplex and full duplex operation.
7. (a) What is network topology? Explain briefly with the help of proper diagrams Mesh and Hybrid topologies.
(b) What are the differences between a Bridge and a Router?

6 + 3 + 3 = 12

(1 + 3 + 3) + 5 = 12

Group – E

8. (a) You want to access your college website - www.heritageit.edu. You typed the URL address in your browser. Explain step by step, how your request will be eventually served by the web server hosting your college website.
(b) While sending e-mail to your instructor, what role does DNS server and POP server play in the process of sending e-mail?

8 + 4 = 12

9. (a) What is DNS? Four DNS servers are involved in DNS look up process. What are they and exactly what role they play in the process?

- (b) In Computer Networking, every device has two addresses, what are they? Why a computer requires two addresses when it is connected to a network?

(2 + 6) + 4 = 12

Department & Section	Submission Link
BT	https://classroom.google.com/c/MzAxODg4NTU1Mjgx/a/MzY0NTY0NjYyOTE2/details