

**DATA BASE MANAGEMENT SYSTEM AND COMPUTER NETWORKING
(CSEN 3205)**

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) Relational algebra is a
(a) procedural language (b) non-procedural language
(c) query language (d) structured language.
- (ii) View is a
(a) temporary table (b) virtual table
(c) permanent table (d) SQL statement.
- (iii) "End to end delivery" is done by
(a) Transport Layer (b) Network Layer
(c) Data Link Layer (d) Session Layer.
- (iv) Redundancy is dangerous as it is potential threat to data
(a) integrity (b) consistency
(c) sufficiency (d) none of these.
- (v) In a two phase locking protocol a transaction must
(a) release all locks at the same time
(b) not obtain any new locks once it has started locks
(c) only obtain locks on item not used by any other transactions.
(d) ensure that deadlock will never occur.
- (vi) The interconnection network is very much costly in
(a) MESH (b) STAR
(c) BUS (d) RING.
- (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) The decoupling of external level and the conceptual level is called
(a) logical data independence (b) local data independence
(c) physical data independence (d) non-local data independence.
- (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) Signaling and interpretation of bits are done in OSI
(a) Data link layer (b) Physical layer
(c) Application layer (d) Presentation layer.

Group - B

2. (a) Describe three tier architecture of DBMS.
(b) Answer the following queries in SQL using the given database schema:
EMP(Emp_No, Ename, Eadd, Designation, Bdate, Mg_No, Salary, Dno);
DEPT(Dname, Dno, Mg_No);
PROJECT(Pno, Pname, Dno, Plocation);
WORKS_ON(Eno, Dno, Hours);
(i) List the employee no, names, address of all the employees working in 'Research' department.
(ii) For all projects in Kolkata print the project number, project location, controlling department's number and its manager's name and address.
(iii) List the average salary of all the employees working in 'Education' department.
(iv) List the employees whose salary is same as the salary of FRANK or SANDRINE. List the result in descending order of salary.
3. (a) Design an E-R diagram of hospital management system with the following entity: Try to include the constraints in the E-R.
User (login, password), Admin (login, password),
Test (diag_no, diag_date, remark, advice_date, final_diag, ecg, others),
Patients (reg_no, reg_date, name, add, city, contact_no),
Medicine (diag_no, med_no, med_name, precaution, no_of_doses),
Blood_test (reg_no, test_date, haemoglobin, tlc, esr, other),
Patient_fee (receipt_no, reg_no, amt_due, amt_paid, date_payment).
(b) Describe derived attributes, aggregation relationships with example.

8 + (2 + 2) = 12

Group - C

4. (a) Explain the terms 'partial functional dependency' and 'non-transitive dependency' with example.
(b) What are the ACID properties of a transaction?

(4 + 4) + 4 = 12

B.TECH/BT/6TH SEM/CSEN 3205 (BACKLOG)/2022

5. (a) Explain with example: Primary key, foreign key and candidate key.
(b) Consider the relation assignment {worker_id, building_id, startdate, name skilltype} and FDs are {worker_id->name, (worker_id, building_id)->startdate}. Is the relation in 2NF? If not, then make it in 2NF.

6 + 6 = 12

Group - D

6. (a) Write down the functions of data link layer and physical layer in the OSI model.
(b) Compare simplex, half duplex and full duplex communication.
7. (a) Write down the advantages and disadvantages of mesh and star topology.
(b) What are the functions provided by physical link layer and network layer in the OSI model?

(4 + 4) + 4 = 12

(4 + 4) + (2 + 2) = 12

Group - E

8. (a) What are the advantages of distributed systems over the centralized systems?
(b) Briefly explain about the architecture of an email.
9. (a) Write short notes on the following (any three):
(i) Packet switching and circuit switching
(ii) URL
(iii) Search Engine
(iv) Different documents in WWW.

3 + 9 = 12

(4 × 3) = 12

