

(3 Hours)**[Total Marks: 80]**

- N.B.:** 1) Question No.1 is **compulsory**.
2) Attempt any **three** from the remaining **five** questions.

1. Write a short note on following (any Four)
 - (a) Data Independence (5)
 - (b) Generalization and specialization (5)
 - (c) Differentiate Extensible and linear hashing (5)
 - (d) Role of DBA (5)
 - (e) Objects, Oids and reference types (5)
 - (f) Differentiate OODBMS and ORDBMS (5)

2. (a) Design an Entity Relationship (ER) model for a college database with following requirements (10)
 - (i) A college contains many departments
 - (ii) Each department can offer any number of courses
 - (iii) Many instructors can work in a department
 - (iv) An instructor can work only in one department
 - (v) For each department there is a Head
 - (vi) An instructor can be head of only one department
 - (vii) Each instructor can take any number of courses
 - (viii) A course can be taken by only one instructor
 - (ix) A student can enroll for any number of courses
 - (x) Each course can have any number of students

Draw an ER diagram for the case and also write the schema definition.

- (b) Explain Architecture of DBMS with the help of diagram (10)

3. (a) Explain 1NF, 2NF, 3NF with the help of example. Normalize the below table till 3NF. (10)

(b)

EMP_PROJ			
Ssn	Ename	Pnumber	Hours
123456789	Smith, John B.	1	32.5
		2	7.5
666884444	Narayan, Ramesh K.	3	40.0
		453453453	English, Joyce A.
333445555	Wong, Franklin T.	2	20.0
		3	10.0
		10	10.0
		20	10.0
999887777	Zelaya, Alicia J.	30	30.0
		10	10.0

- (b) What are the various data distribution techniques in Distributed database (10)

4. (a) Find the candidate key and closure for given set of functional dependencies.
Consider the relation R(A,B,C,D,E) with dependencies:
R = ABCDE, F = {A → BE, C → BE, B → D}
- (b) Explain B+ tree with the help of an example.
5. (a) How ISAM is different from B+ tree
- (b) How conflict serializability is different from view serializability? Explain with the help of an example?
6. (a) Explain difference between query and transaction. Explain various transaction states with the help of diagram?
- (b) Explain parallel data base architecture with the help of a diagram.