EDUCLASH
Just Another Way To Learn

**Q. P. Code: 22966**

**[Total Marks: 80]**

**(3 Hours)**

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

Write a short note on following (any Four)

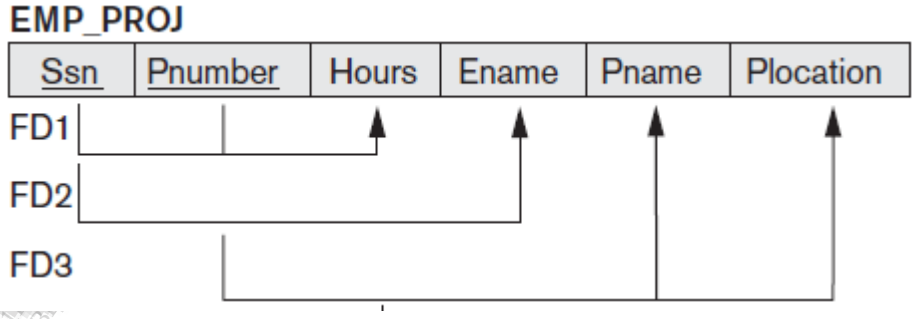
1. (a) Role of DBA (5)
   (b) Weak Entity Set and Strong Entity Set (5)
   (c) Primary and Secondary Index (5)
   (d) Deadlock Handling (5)
   (e) ADT (5)
   (f) Structured Data Types in ODBMS (5)

2. (a) A university Registrar's office maintains data about the following entities: (10)
   i. courses, including number, title, credits, syllabus, and prerequisites;
   ii. course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
   iii. students, including student-id, name, and program;
   iv. instructors , including identification number, name, department, and title.

   Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

   (b) Explain the architecture of database system. Explain how it is different from conventional file system. (10)

3. (a) Explain the architecture Of distributed databases? (10)
   (b) Define 1NF, 2NF and 3NF with help of an example consider the following relational schema (10)



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*SSN- Social Security Number of Employee*
*Pnumber- Project Number*
*Hours- Number Of Hours an employee works on project*
*Ename- Name of Employee*
*Pname – Name Of Project*
*Plocation- Location of Project*

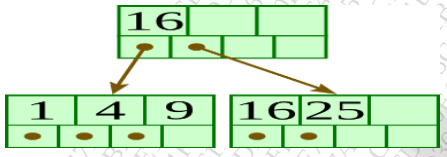
Decompose the above relation into 3NF

4. (a) For a given relation R(A,B,C,D,E,F,G) following functional dependencies hold (10)
A→B
BC→DE
AEF→G
Prove that ACF →DG

(b) Explain Hash based indexing with the help of an example? (10)

5. (a) (i)What is B+ tree ? Explain with the help of an example . (05)

(ii )Consider the following B+ tree (05)




Perform following operations on B+ tree assuming maximum node capacity to hold 3 elements

A. Insert 20
B. Insert 13

(b) (i) Consider the following schedules involving two transactions. (05)

**S1: $R_1(X)$, $R_1(Y)$, $R_2(X)$, $R_2(Y)$,$W_2(Y)$ , $W_1(X)$**
**S2: $R_1(X)$, $R_2(X)$, $R_2(Y)$, $W_2(Y)$ ,$R_1(Y)$, $W_1(X)$**

Which one of the above schedules is conflict serializable? Justify your answer.

(ii) Explain the following terms with the help of an example (05)

A. Dirty Read
B. Lost Update

6. (a) Explain various locking protocols . (10)

(b) Differentiate between Object Relational Database management system and Object Oriented Database management system. (10)

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