8. a) Explain View with suitable example. What is the usefulness of a view ? 3 + 2

b) Consider the following relations and write down expressions for the following queries :

EMP (eid,ename,age,address,salary)

Works (eid,did,hours)

Dept (did,dname,managerid)

i) List the name of employees who work for the 'Research' department for 8 hours using Relational Algebra.

ii) List name and address of all employees with department number 5 using Relational Calculus.

iii) Find the managerid of managers who manage only departments with budgets greater than 1 lac using SQL.

iv) Find the employee who has highest salary using SQL. 10

9. What is functional dependency ? What is the need for normalization ? Explain 2nd and 3rd normal form with example. Consider the following relation :

EMP_PROJ = { SSn, Pnumber, Hours, Ename, Pname, Plocation }. Assume { SSn, Pnumber } as primary key. The dependencies are { SSn, Pnumber } → Hours; SSn → Ename; Pnumber → { Pname, Plocation }.

Normalize the above relation into 2NF. 3 + 3 + 3 + 6

10. a) Let R (ABCDE) be a relation schema and consider the following functional dependencies F = { AB → E, AD → B, B → C, C → D }, find out the candidate key. 5

b) Draw the ER diagram of a hospital and explain. 10

11. Write short notes on any *three* of the following : 3 × 5

a) Database language

b) Metadata

c) Two phase locking protocol

d) B+ tree

e) B tree.

2013

ABASE MANAGEMENT SYSTEM

3 Hours *Full Marks : 70*

figures in the margin indicate full marks.

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

GROUP – A

(Multiple Choice Type Questions)

the correct alternatives for the following : 10 × 1 = 10

Which one is not an aggregate function ?

a) Sum b) Count

c) Select d) max.

Which of the following is not a DDL statement ?

a) SELECT b) ALTER

c) CREATE d) DROP.

View is a

a) Virtual relation b) Temporary relation

c) Dynamic relation d) all of these.

iv) Im relational model degree of a relation is
   a) no. of Attributes
   b) no. of Rows
   c) no. of Prime attributes
   d) schema.

v) The ability to change the conceptual schema witho having to change external schema is
   a) logical data independence
   b) physical data independence
   c) three schema architecture
   d) sub-schema.

vi) Which key cannot be null ?
   a) Foreign key b) Primary key
   c) Super key d) Unique key.

vii) Relational calculus is a
   a) Procedural language
   b) Non-Procedural language
   c) Query language
   d) none of these.

viii) The rename operation used in relational algebra is
   a) unary operation b) binary operation
   c) ternary operation d) none of these.

ix) Overall logical structure of a database can b graphically represented by
   a) ER-diagram b) Records
   c) Relation d) Hierarchy.

x) A normal form in which every non prime attribute fully dependent on prime attribute is
   a) 1NF b) 2NF
   c) 3NF d) BCNF.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

t is attribute inheritance ? Describe the concept of alization and generalization in the context of E-R data el. 1 + 4

the advantages of using database system over file-d information system.

ribe Three-Schema Architecture of DBMS. Distinguish ical Data Independence and Logical Data Independence. 3 + 2

cuss the ACID properties of transaction.

ate the steps involved in query processing. Why is the ry optimization needed ? 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

a) What is Weak entity set ? Explain with suitable example. 4

b) What do you mean by 'Ternary relationship' ? Define the concept of aggregation with a suitable example. 4

c) Define a foreign key. Why is the concept needed ? How does it play a role in the join operation ? 5

d) Explain how to reduce a relationship set of an E-R diagram into relational schema. 2