B. Math. III yr.

QUESTION PAPER FOR B.MATH

Answer any five full questions.

1) Define the following terms.
a)Database Management System b)Primary key c)Candidate key d)Foreign key e)Entity f)Attribute g)Functional dependency h)Superkey I) Multivalued attribute. j)relation.

20 = 10 × 2

2) a.) Explain levels of abstraction in a DBMS. 05
b) Explain with an example Scheme and instance. 06

c) Develop an ER diagram for the following . 09
- i) Information about employee such as number,name,address are recorded.
- ii) Information about department such as department number ,name, is stored.
- iii) Each item sold is represented.The details stored are name,manufacturer,price,modelno,itemnumber.
- iv) The manufactuer is represented.The data stored about him are name,address,items supplied,price.
- v) Each department has a manager as one of its employee.
- vi) Each employee works for a department.
- vii) Each department stores items sold.

3) a) Explain with an example Hash file organization. 10

b)Give the result of 1) union 2) Cartesian product 3) Difference on the following relations.

R1

a	b	c
1	2	2
4	3	4
2	3	2

R2

d	e	f
1	3	3
2	4	5
3	2	6

10

4)Express the following queries in relational algebra and QBE. 20

The data base schema is (supplier-part database)
S(sno,sname,address)
P(pno,pname,color,weight)
SP(sno,pno,qty)

- i) Get the color of the parts supplied by sno=5.
- ii) Get total quantity of parts supplied by sno=5.
- iii) Get address of suppliers who supply part pno=9.
- iv) Get suppliername and partname for pno=7 .

v) Get part names of parts supplied by supplier named 'subhash'

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5) a) For the schema in question number 4, express the queries in question number 4 in SQL. 10

b)State and explain Armstrongs axioms for functional dependencies. 05

c)Compute closure and findout keys of the relation using the following functional dependencies.

AB->C,C->A,BC->D,ACD->B,D->EG,BE->C,CG->BD,CE->AG 05

6) a)Find the minimal set or canonical cover of 10

R(ABC) and F.D. ={A->BC,B->C,A->B,AB->C}

b)Prove the following axioms 10

i) {X->Y,X->Z} => X->YZ

ii) {X->Y,WY->Z} =>XW->Z

iii){X->Y} and Z is subset of Y then X->Z holds.

7)a) Test for Lossless join. 10

R=(ABCDE).

R1=(AD),R2=(AB},R3=(BE),R4=(CDE),R5=(AE).

Functional dependencies are

A->C,B->C,C->D,DE->C,CE->A.

b)Define the following Normal Forms and also give examples. 10

i)Boyce-Codd Normal Form.

ii)Third Normal Form.

8)Write Short notes on the following. 20

i)Network Model

ii)Data independence

iii)Hierarchical model.

iv)Query optimization

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