

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. THIRD SEMESTER EXAMINATION, MARCH 2021

SECOND YEAR [BATCH 2019-22]

COMPUTER SCIENCE [HONOURS]

Date : 18/03/2021

Time : 11.00 am – 1.00 pm

Paper : VII [CC 7]

Full Marks : 50

Answer **any five** questions of the following :

[5×10]

1. a) Draw an Entity Relationship Diagram of College Admission Management System.

b) Discuss Hierarchical data Model with their pros and cons.

[5+5]

2. a) Briefly discuss about Total and Partial participation.

b) What do you mean by ternary relationship? What do you mean by functional dependency?

[(2.5+2.5)+(2+3)]

3. a) What is timestamp based protocol in transaction management?

b) Discuss the term i) Tuple Relational Calculus and ii) Division Operation in Relational algebra

[5+(2.5+2.5)]

4. a) What do you mean by physical and logical data independence in DBMS?

b) Consider the database schema given below and answer the following SQL queries:

Teacher (t_name, dept, tel_no)

Subject (s_title, credit)

Student (s_name, course, hostel)

Taught-by (t_name, s_title)

Taken-by (s_name, s_title, status, grade)

i) Find the names of students who take DBMS (subject) as elective (status) and secure A-grade.

ii) Student of Aurobindo hostel who do not study DBMS

iii) Name of students who study all subjects taught by Prof X.

iv) Find the names of Students of BSc course living in Netaji hostel who study no subject taught by Prof X.

[2+(4×2)]

5. a) What do you mean by collision resolution technique in hashing?

b) What are the different phases of DBMS transactions?

[(2.5+2.5)+5]

6. a) Consider the Relation R(ABCDXY) and Functional Dependency set

$F = \{A \rightarrow B, C \rightarrow DX, AC \rightarrow Y\}$ decomposed into

$D = R_1(BX), R_2(ACDXY).$

Find whether D is Lossless or Lossy?

b) Let R(PQRDE) be a relational schema with the following functional dependencies :

$F = \{P \rightarrow QR, RD \rightarrow E, Q \rightarrow D, E \rightarrow P\}$

$D = \{PQRE, QD\}$

Check whether the decomposition D is preserving dependency or not?

[5+5]

7. a) What do you mean by aggregation and specialization?

b) What are the advantages of DBMS over traditional file system?

[(2.5+2.5)+5]

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