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TBC–302/TBI–302/TBS–303

B. C. A./B. SC. (IT)/B. SC. (H) (CS)

(THIRD SEMESTER)

MID SEMESTER

EXAMINATION, Oct., 2023

DATABASE MANAGEMENT SYSTEM

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Define Database and Database Management System. Describe the advantages and disadvantages of using of DBMS. (CO1)

OR

(b) What are the different types of database end users ? Describe the responsibilities of the DBA and the database designer. (CO1)

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2. (a) Differentiate between the following : (CO1)

   (i) Logical database design and Physical database design.

   (ii) Flat file system and DBMS

   OR

   (b) Describe the three level architecture/components of DBMS. Explain how it is useful for achieving data independence. (CO1)

3. (a) Why do we use E-R model while designing a database ? What are the various components used to draw an E-R diagram ? (CO1)

   OR

   (b) Suppose that you are designing a schema to record information about reality shows on TV. Tour database needs to record the following information : (CO1)

   (i) For each reality show, its name, genre, basic_info and participants name. Any reality show has at least two or more participants.

   (ii) For each producer, the company name, company country. A show is produced by exactly one producer. And one producer produce sexactly one show.

   (iii) For each television, its name, start year, head office. A television may broadcasts multiple shows. Each show is broadcast by exactly one television.

   (iv) For each user, his/her username, password, and age. A user may rate multiple shows, and a show may be rated by multiple users. Each rating has a score of 0 to 10.

   Draw an entity relationship diagram for this database.

4. (a) Enlist various types of database constraints. Also differentiate between entity intigrity and referential integrity. (CO2)

OR

(b) Differentiate between DBMS and RDBMS. List and explain different types of keys. (CO2)

5. (a) What is relation algebra ? What are the different operators used in relation algebra ?

OR

(b) Consider the following relational database schema consisting of the four relation schemas :

passenger (pid, pname, pgender, pcity)

agency (aid, aname, acity)

flight (fid, fdate, time, src, dest)

booking (pid, aid, fid, fdate)

Answer the following questions using relational algebra queries :

(i) Get the complete details of all flights to New Delhi.

(ii) Get the details about all flights from Chennai to New Delhi.

(iii) Find only the flight numbers for passenger with pid 123 for flights to Chennai before 06/11/2023

(iv) Find the passenger names for passengers who have bookings on at least one flight.

(v) Find the passenger names for those who do not have any bookings in any flights.