WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 4th Semester Examination, 2022

CMSACOR10T-COMPUTER SCIENCE (CC10)

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer Question No. 1 and any *four* from the rest

1.   Answer any *four* questions from the following: 2×4 = 8

  (a) What are the applications of DBMS?

  (b) BCNF is stronger than 3NF — Explain.

  (c) What is an objective of the Normalization?

  (d) Differentiate between Primary key and Candidate key.

  (e) Distinguish between physical independencies and logical independencies.

  (f) Compare and contrast on — a flat file database and a relational database.

2. (a) We can convert any weak entity set to a strong entity set by simply adding   4+2+2
       appropriate attributes. Why, then, do we have weak entity sets?

  (b) Why the Armstrong's axioms are required?

  (c) State the relationship among candidate key, primary key and alternate key.

3. (a) Consider the following relational schema and write down appropriate   (3+3)+2
       expressions for the following queries:

       SUPPLIER (SNO, SNAME, STATUS, CITY)
       PARTS (PNO, PNAME, COLOR, WEIGHT, CITY)
       SHIPMENT (SNO, PNO, QTY)
       PRIMARY KEY (SNO, PNO) of (SUPPLIER, PARTS)
       FOREIGN KEY (SNO) REFERENCE SUPPLIER (SNO)
       FOREIGN KEY (PNO) REFERENCE PARTS (PNO)

   Write the following queries:

   (i)   Get part numbers for parts that either weight more than 16 or are
         supplied by supplier S_2 (Using Relational Algebra).

   (ii) Get Supplier names who supply all Green parts. (Using SQL)

  (b) What is the role of CHECK and DEFAULT constraints?

4. (a) Draw an ER diagram for Library Management System. 6+2

   (b) What is derived attribute?

5. (a) Differentiate between file based system and database management system. 4+4

   (b) Write the advantages and disadvantages of DBMS.

6. (a) When do we call a relation is in 3NF? 2+4+2

   (b) What is Cartesian/Cross product? Explain it.

   (c) How rename operator works in relational algebra?

7. (a) What is Indexing in Database? Write the advantages and disadvantages of Indexing. (2+4)+2

   (b) What is Redundancy?

8. (a) Define insertion, deletion and updation anomalies which occur during database design process. 3+3+2

   (b) What is data redundancy? Why removal of redundancies are required?

   (c) Define meta data and data dictionary.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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