



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 4th Semester Examination, 2020

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.*

GROUP-A

1. Answer any **four** questions from the following: 2×4 = 8
- (a) What is determinant of a functional dependency?
 - (b) When is a relation said to be in 2NF?
 - (c) Explain data anomaly.
 - (d) What do you mean by database constraint?
 - (e) Differentiate between primary key and unique key.
 - (f) Write the syntax and example of UPDATE command in SQL.
 - (g) What is inheritance in generalization hierarchies?

GROUP-B

Answer any four questions from the following

8×4 = 32

2. (a) Consider the relational database as given below and write down expressions in relational algebra for the following queries. 1+2+1
- Material_Master (item_id, item name, reorder level)
Material_Dts (item_id, Supplier_id, Purchased_data, Qty, Utcost)
- (i) Select the qualities of each purchased material alphabetically.
 - (ii) Select the names of materials which have the height total quantity.
 - (iii) Replace the material name 'power supply' with 'UPS'.
- (b) What is the concept of a weak entity used in data modeling? 2
- (c) List two reasons why 'null' values might be introduced into the database? 2
3. (a) Differentiate Domain Relational calculus and Tuple Relational calculus. 4+4
- (b) Draw ER diagram of a College Campus Management System. Make necessary assumptions.

4. (a) What are dense and sparse indexing? Explain with an example. 4+2+2
(b) What is a view?
(c) What is Join?
5. (a) When do we call a relation is in 3NF? 1+4+3
(b) Consider the relation assignment {worker_id, building_id, startdate, name, skilltype} and FDs are
{worker_id -> name, (worker_id, building_id) -> statedate}.
Is the relation in 2NF? If not, then make it in 2NF.
(c) Describe Boyce-Codd normal form with example.
6. Consider the following tables: 6+2
(a) Consider the following schema:
Suppliers (sid, sname, address) Parts (pid, pname, color)
Catalog (sid, pid, cost) Write the relational algebraic queries for the following:
(i) Find the sids of suppliers who supply some red or green part
(ii) Find the sids of suppliers who supply every red or green part
(iii) Find the pids of parts supplied by at least two different suppliers.
(b) What do you mean by DML?
7. (a) Describe ACID properties of a transaction. 4+2+2
(b) In a concurrent schedule, when do two instructions conflict?
(c) What is cascading rollback?
8. (a) Discuss the advantages and disadvantages of using DBMS approach as compared to using a conventional file system. 4+(2+2)
(b) Define the concept of Aggregation and Cardinality Ratio.

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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