B. TECH. (COMPUTER SCIENCE & BUSINESS SYSTEMS) (CBCS - 2018 COURSE)
B.Tech. (CSBS) Sem - IV :SUMMER- 2022
SUBJECT : DATABASE MANAGEMENT SYSTEMS

Day : Thursday

Date : 16-06-2022

S-20453-2022

Time : 10:00 AM-01:00 PM

Max. Marks : 60

N. B. :
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non-programmable calculator is **ALLOWED**.
4) Draw neat and labelled diagrams **WHEREVER** necessary.
5) Assume suitable data, if necessary.

Q. 1 Design a generalization – specialization hierarchy for a motor-vehicle sales **(10)** company. The company sells motorcycles, passenger cars, vans and buses. Justify your placement of attributes at each level of hierarchy.

OR

Why are keys and integrity constraints important in databases? Classify the **(10)** different types of keys and demonstrate an example of each.

Q. 2 Consider the following schema: **(10)**

Suppliers (sid, Sname, address)

Parts (pid, pname, color)

Catalogue (sid, pid, cost)

For the above given schema, find relational algebra expressions for following:

i) Find names of suppliers who supply red parts.

ii) Find names of suppliers who supply red gear part or green lever parts.

iii) Find name and address of suppliers who supply red or green part costing below 5000.

For the given schema write SQL query which shows minimum, maximum and average cost of parts.

OR

How are SQL commands classified? Enlist and explain the commands of **(10)** anyone category of SQL commands with their syntax and appropriate example.

Q. 3 Arbitrate the terms used in databases for following: **(10)**

i) Repetition of information

ii) Inability to represent information

Why does each of these properties imply a bad relational database design? How to overcome these?

OR

Articulate the objective and process of Fourth Normal Form (4NF) with a **(10)** suitable example. Why is 4NF more desirable than Boyce – Codd Normal Form?

P. T. O.

Q. 4 What are the advantages and disadvantages of hash indices relative to **(10)**
B + tree indices? How is the choice of query processing strategy influenced
by type of index?

OR

State the role of evaluation plans in the query optimization process. How are **(10)**
evaluation plans chosen?

Q. 5 When does a deadlock occur? Enlist the principal methods and schemes used **(10)**
therein, for dealing with the deadlock problem. Discuss any one method and
its scheme.

OR

Which method determines the serializability order by selecting the ordering **(10)**
among transactions in advance? Describe the method with an example.

Q. 6 What is SQL injection? How is it harmful for database? What is the role of **(10)**
intrusion detection? Can it help prevent SQL injection?

OR

What are logical databases and web databases? How are their functions and **(10)**
structure different from relational database? What are these database used?

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