Total No. of printed pages = 4

BCA 171302

Roll No. of candidate

4/2/22 2021

B.C.A. 3rd Semester End-Term Examination

DATABASE MANAGEMENT SYSTEM

(New Regulation)

Full Marks – 70   Time – Three hours

The figures in the margin indicate full marks for the questions.

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

1. Choose the correct answer :   (10 × 1 = 10)

    (i)   Redundancy in database means

          (a)   Storing same copy of data many times

          (b)   Storing inconsistent data.

          (c)   Storing irrelevant data

          (d)   All the above

    (ii) Find the incorrect statement

          (a)   Foreign key attribute refers the primary key attribute of another relation

          (b)   Foreign key values cannot be null.

          (c)   Primary key is always have unique values.

          (d)   Primary key also a candidate key.

    (iii) A View is

          (a)   A table   (b)   Window to a table

          (c)   Can store data in it   (d)   None of the above.

    (iv) Which one is a binary operation

          (a)   Select   (b)   Project

          (c)   Rename   (d)   Join

[Turn over

(v) Transaction is a

    (a) Process

    (b) Executed program

    (c) Contains Read or Write Operations

    (d) All the above

(vi) If A→B, B→C, C→D then

    (a) A→D   (b) A→C

    (c) A→BCD   (d) All the above

(vii) Match Column A and B

    Column A   Column B

    I. Select   1. Unary operation and column selection

    II. Project   2. Binary Operation

    III. Join   3. Unary operation and row selection

    (a) I- 1, II-2, III-3   (b) I-3, II-1, III-2

    (c) I-3, II-2, III-1   (d) None of (I) (II) (III)

(viii) The SQL statement

Select empno, ename, dateofbirth from EMP where dateofbirth>'01-JAN-2001' Order by ename; Contains relational algebra operation of type:-

    (a) Select operation   (b) Project operation

    (c) Select and project both   (d) Join operation

(ix) A relation is in 3NF if

    (a) There is no partial dependency

    (b) Contains atomic values only

    (c) There is no transitivity

    (d) All the above

(x) Multi-valued attribute

    (a) Contains many values from same domain

    (b) Contains many values from different domain

    (c) Contains many attributes.

    (d) None of the above

2. (a) What do you mean by an ER diagram? Explain the symbols for drawing ER diagram. (2+6=8)

(b) Draw an ER diagram describing Student, Teacher, Subject as entity type and Class as a relationship type where there will an attendance for each student, Teacher and subject on a particular date and time. (assume attributes which are meaningful and necessary). (7)

3. (a) Write the steps followed to convert an ER diagram into a relational schema. (9)

(b) What do you mean by cardinality ratio? Discuss 1:1 , 1:N and M:N cardinality ratio with examples. (6)

4. Given the relations

ITEM (itemno, itemname, type,Stock_in_hand)

SUPPLIER(suppno, suppname, address, phone, Exp)

SUPPLY(suppno,itemno, suppdate,qty)

Write SQL statements for

(a) Find the suppname who supplied the items of type "LIQUID". (3)

(b) Find suppno,suppname who are from address "NEW DELHI". (3)

(c) Find the item name whose stock_in_hand is less than 10. (3)

Write relational algebra expression for:

(d) Finding the supplier details who have Exp >=10. (3)

(e) Find all Itemname, suppname and qty. (3)

5. (a) What do you mean by normalization? Explain 3NF with an example. (7)

(b) State and prove Armstrong's inference rules (8)

6. (a) What do you mean by transaction log? Why it is important ? (4)

(b) Explain the ACID properties (4)

(c) Given a relation R(A,B,C,D,E) with FD's { A→BC, BC→DE}.

(i) Find determinants, candidate key from the relation. (3)

(ii) Normalise the relation to 3NF (4)

7. Write short notes on : $(3 \times 5=15)$

-   (a) Lossless and dependency preserving decomposition

-   (b) Multi-valued Vs Composite attribute

-   (c) Aggregate functions

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