S.No. : 245

BCS 3401

No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33215 Roll No.

B. Tech. Examination 2021-22

(Even Semester)

DATABASE MANAGEMENT SYSTEMS

Time : Three Hours] *[Maximum Marks : 60*

Note :– (i) Attempt all question as instructed.

(ii) Be neat & precise in your answer.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

(a) What do you mean by keys?

(b) If R1 is a relation with 5 rows and R2 is a relation with 3 rows, how many rows will the cartesian product of R1 and R2 have?

(c) Define DML and DDL with example.

(d) Explain integrity constraints, with example.

[P. T. O.

(e) What is distributed databse?

(f) Explain the concept of minimal cover with example.

(g) What are schedules? Explain with example.

(h) What is data independence?

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Consider the relation R (A, B, C, D, E, F, G, H, I, J) and the set of functional dependencies F as given below :

$F = \{AB \rightarrow C, A \rightarrow DE, B \rightarrow F, F \rightarrow GH, D \rightarrow IJ\}$

(i) Determine the key of R.

(ii) Decompose R into second normal form.

(b) Define the following term in relation algebra :

(i) Select project

(ii) Natural join

(iii) Rename operation

(iv) Referential integrity constraint

(c) Consider the following schema :

Customer (cust #, (name, C Address, City)

Order (0#, O Date, C#, Total Amt.)

Order Item (O#, I#, Qty, Total price, Discount)

Item (I#, Item Name Manufacturer, Expiry Date, Price)

Write down the following queries in SQL :

(i) Write the SQL DDL language to make C# in order, O# and I# in order item to foreign key which take references from cust# in customer, O# in order and I# item respectively.

(ii) Find the name of all items which are expired today.

(iii) Find the customer name with total purchasing amount.

(d) Determine the following schedule is serializable or not :

$T_1 : r_1(x); r_1(z); w_1(x);$

$T_2 : r_2(z); r_2(y); w_2(z); w_2(y)$

$T_3 : r_3(x); r_3(y); w_3(y)$

S : $\{r_1(x); r_2(z); r_3(x); r_1(z); r_2(y); r_3(y);$
$w_1(x); w_2(z); w_2(y)\}$

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. $5 \times 8 = 40$

3. (a) What is distributed database?

(b) Explain the time stamping lock protocol.

(c) Explain multiverism locking protocol.

4. (a) Describe the ACID property of transaction.

(b) What are schedules? Define conflict and view serializable schedule.

(c) Define recoverable and cascadeless schedule? What are the drawbacks on using non-recoverable schedule, with example.

5. (a) Explain the minimal and closure of the functional dependency.

(b) What is normalization? Discuss insertion, deletion and update anomalies.

(c) Consider the schema R (A, B, C, D) suppose following FO's hold :

$$F\{E \rightarrow A, CD \rightarrow E, A \rightarrow BC, B \rightarrow D\}$$

state whether the following decomposition of R (A, B, C, D, E) is loss-less joint decomposition or lassy decompsotion :

(i) $R_1 = (A, B, C)$ and $R_2 = (A, D, E)$

(ii) $R_1 = (A, B, C)$ and $R_2 = (C, D, E)$

6. (a) Give the architecture of database system and describe the role of different module.

(b) What is ER model? Explain different types of attribute in ER model with their notation.

(c) Differentaite between weak and strong entity set with example.

⌘⌘⌘