



## BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – B.Tech.(ECE)-2019/B.Tech.(ECE)-2020

Course Name – Data Base Management Systems

Course Code - OEC501A

( Semester V )

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Baraset, Kolkata - 700123

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Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Select one key from the the following that uniquely identifies the elements in the relation?
- |                  |                  |
|------------------|------------------|
| a) Secondary Key | b) Primary key   |
| c) Foreign key   | d) Composite key |
- (ii) The result of which operation summarizes all pairs of tuples from the two relations, regardless of whether their attribute values match.
- |                 |                      |
|-----------------|----------------------|
| a) Join         | b) Cartesian product |
| c) Intersection | d) Set difference    |
- (iii) Select the one from the following that creates a virtual relation for storing the query?
- |              |                  |
|--------------|------------------|
| a) Function  | b) View          |
| c) Procedure | d) None of these |
- (iv) A table with absence of transitive dependency is a condition that is classified as:
- |   |                                  |
|---|----------------------------------|
| a) Be in Second Normal Form (2NF)   | b) Be in Third Normal Form (3NF) |
| c) <code>&lt;style type="text/css"&gt;&lt;!--td {border: 1px solid #ccc;}br {mso-data-placement:same-cell;}&lt;/style&gt;&lt;style type="text/css"&gt;&lt;!--td {border: 1px solid #ccc;}br {mso-data-placement:same-cell;}&lt;/style&gt;</code> Be in Fourth Normal Form (4NF) | d) Be in Fifth Normal Form (5NF) |
- (v) The primary medium for the long-term online storage of data explains the \_\_\_\_\_ where the entire database is stored on magnetic disk.
- |                         |                   |
|-------------------------|-------------------|
| a) Semiconductor memory | b) Magnetic disks |
| c) Compact disks        | d) Magnetic tapes |
- (vi) Determine that if a piece of data is stored in two places in the database, then
- |                            |  |
|----------------------------|--|
| a) Storage space is wasted | b) Changing the data in one spot will cause data inconsistency |
|----------------------------|--|



4. Discover the closure of attribute set  $(AG)^+$  i.e.  $(AG)^+$  in the relational schema  $R$  and set of functional dependencies  $F$  as given below:  $R = (A, B, C, G, H, I)$ ;  $F = \{A \rightarrow B, A \rightarrow C, CG \rightarrow H, CG \rightarrow I, B \rightarrow H\}$  (3)

5. Differentiate the wait-die and wound-wait protocols for deadlock prevention. (3)

6. Express the concept of Primary Indexing with a suitable example. (3)

OR

Express the concept of indexing and identify the different types of indexing. (3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

7. Estimate the desirable properties of transactions. (5)

8. Define candidate key, primary key, super key, composite key and alternate key with suitable examples. (5)

9. Illustrate database Recovery? Explain Shadow paging in detail. (5)

10. The IT Training Group (Kolkata) has contacted you to create a conceptual model by using the Entity-Relationship data model for a database that will meet the information needs for its training program. The Company Director has provided the following description of the training group's operating environment. The Company has twelve instructors and can handle up to one hundred trainees per training session. The Company offers five advanced technology courses, each of which is taught by a teaching team of two or more instructors. Each instructor is assigned to a maximum of two teaching teams or may be assigned to do research. Each trainee undertakes one advanced technology course per training session. Identify an ER diagram for IT Training Group (Kolkata) based on the preceding information. (5)

11. Demonstrate bulk loading of B+ tree of order 3 with the following data (key\*) (5)  
56\*, 32\*, 18\*, 72\*, 45\*, 16\*, 98\*, 83\*, 81\*, 27\*, 39\*, 51\*, 66\*, 44\*, 33\*, 22\*

12. Test the functions of data warehouse tools and utilities. (5)

OR

Summarize deadlock and Explain deadlock prevention, deadlock detection. (5)

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