

CS/MCA/Even/Sem-2nd/MCA-204/2015



WEST BENGAL UNIVERSITY OF TECHNOLOGY

MCA-204

DATA BASE MANagements SYSTEM-I

Time Allotted: 3 Hours

Full Marks: 70

The questions are of equal value.

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP A

(Multiple Choice Type Questions)

1. Answer *all* questions. 10×1 = 10
- (i) If two attribute both of which can be treated as primary key, the either of the keys is called
- (A) foreign key (B) alternate key
(C) candidate key (D) super key
- (ii) COUNT (*) returns
- (A) number of rows regardless of NULLS
(B) number of rows regarding of NULLS
(C) number of all the rows
(D) none of these
- (iii) Which statement is correct: Union operation includes
- (A) combining the columns from the results obtained from the participating queries
(B) combines the rows from the results obtained from the participating queries
(C) both (A) and (B)
(D) none of these

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Turn Over

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- (iv) Which of the following database object does not physically exist?
(A) base table (B) index (C) view (D) metadata
- (v) Which of the following statement is False?
(A) A database may have numerous physical views
(B) A database may have numerous users at view level
(C) Both (A) and (B)
(D) None of these
- (vi) Functional dependencies will be required
(A) in schema making
(B) on transaction
(C) on Cartesian product calculation
(D) in normalization
- (vii) What does a Data Dictionary contain?
(A) Physical structure for the information
(B) Logical structure for the information
(C) Physical properties for the information
(D) all of the above
- (viii) The language used by application programs to request data from the DBMS is referred to as the
(A) DML (B) DDL
(C) Query Language (D) None of the above
- (ix) Which one of the following is a DDL command?
(A) TRUNCATE (B) DELETE (C) UPDATE (D) ALTER
- (x) Which of the following is false?
(A) LIKE keyword is used to match sub string
(B) COUNT keyword counts the number of row
(C) WHERE keyword selects row on a given condition
(D) ORDER BY keyword is used to store the data in sorted order

GROUP B
(Short Answer Type Questions)

- Answer any *three* questions. 3×5 = 15
2. Describe the three-schema architecture. Why do we need mappings between schema levels? 3+2
 3. What is the difference between logical data independence and physical data independence? Which one is harder to achieve? Why? 3+2
 4. What is a view? View does not take any memory space. – Justify. How do you create an Insertable and Updatable view? 1+2+2
 5. Find the minimum cover of $F(A \rightarrow BC, AC \rightarrow D, D \rightarrow B, AB \rightarrow D)$ 5
 6. Express the algebraic operation of Division in terms of Projection, Cartesian product and Set Difference. 5

GROUP C
(Long Answer Type Questions)

- Answer any *three* questions. 3×15 = 45
7. (a) What is DBMS? 2
(b) What are the advantages of using DBMS over the file processing systems? 5
(c) Describe different levels of Data Abstraction in database system. 4
(d) Explain with examples, how primary key and foreign key concept is useful in Relational Data Model? 4
 8. Consider the relational schema $R(A,B,C,D,E,F,G,H,I)$ and set of functional dependencies $\{\{A,B\} \rightarrow C, A \rightarrow \{D,E\}, B \rightarrow F, F \rightarrow \{G,H\}, D \rightarrow \{I,J\}\}$. Normalize the above schema up to BCNF and determine whether the resulting decompositions have lossless join property or not. 8+7

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9. Consider the following relational schema. (5+2.5×4)
EMPLOYEE (EMP_NAME, STREET, CITY)
WORKS (EMP_NAME, COMPANY_NAME, SALARY)
COMPANY (COMPANY_NAME, CITY)
MANAGES (EMP_NAME, MANAGER_NAME)

Write the query for creating all the table with constraints (Primary key and foreign key) and the following queries:

- (i) Find the name of all employees who live in the same city as company for which they work.
 - (ii) Find the name of all employees who do not work for "ABC" company
 - (iii) Find the company that has most employees
 - (iv) Find the name of all employees who work for "ABC" company and earn more than 10,000.
10. (a) Create a B+ tree of order 3 with the following data: (5+5+5)
13, 2, 5, 63, 23, 11, 74
(b) Insert the node in the B+ tree.
12, 32, 3
Display the final tree structure.
(c) Delete the nodes in the B+ tree.
11, 3, 32
Display the final tree structure.
11. Write short notes on the following (any five): 3×5
- (a) Multi-valued Functional Dependency
 - (b) Relational DBMS
 - (c) DBMS architecture
 - (d) Atomicity problem
 - (e) DBA
 - (f) BCNF
 - (g) Closure property of an attribute.