



Name: Roll No.:

Branch: Signature of Invigilator:

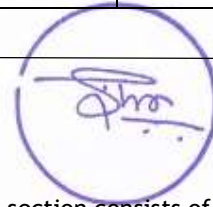
Semester: VIth

Date: 06/05/2022 (MORNING)

Subject with Code: CS301 DATABASE MANAGEMENT SYSTEM (MINOR)

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE



1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.
2. The booklet will be distributed to the candidates before 05 minutes of the examination. Candidates should write their roll no. in each page of the booklet.
3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.
4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.
5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.
6. Write on both side of the leaf and use pens with same ink.
7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.
8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.
9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.
10. Always maintain the highest level of integrity. Remember you are a BITian.
11. Candidates need to submit the question paper cum answer sheets before leaving the examination hall.

SET-I

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: B.Tech
BRANCH: ALL (MINOR)**

**SEMESTER : VI
SESSION : SP/22**

SUBJECT: CS301 DATABASE MANAGEMENT SYSTEM

TIME: 2 HRS

FULL MARKS: 50

INSTRUCTIONS:

- 1. The question paper contains two sections. Section-A consists of 30 MCQ questions of 1 mark each and Section-B consists of 6 descriptive questions of 4 marks each. Answer all questions of section-A and any 5 of Section-B. Total marks is 50.**
 - 2. The missing data, if any, may be assumed suitably.**
 - 4. Before attempting the question paper, be sure that you have got the correct question paper.**
 - 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**
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Section-A

Marks: (1 X 30= 30)

1. _____ is NOT a type of constraint in Database?
 - a) FOREIGN KEY
 - b) UNIQUE KEY
 - c) ALTERNATE KEY
 - d) PRIMARY KEY

2. _____ command makes the updates performed by the transaction permanent in the database?
 - a) ROLLBACK
 - b) COMMIT
 - c) TRUNCATE
 - d) DELETE

3. A process that ensures the system will never enter a deadlock state is called _____
 - a) deadlock detection
 - b) deadlock prevention
 - c) deadlock elimination
 - d) deadlock recovery

4. In lock conversion, upgrading can take place in only the shrinking phase, whereas downgrading can take place in only the growing phase.
 - a) True
 - b) False

5. Which of the following protocols ensures conflict serializability and safety from deadlocks?
 - a) Two-phase locking protocol
 - b) Time-stamp ordering protocol
 - c) Graph based protocol
 - d) None of the mentioned

6. When transaction T_i requests a data item currently held by T_j , T_i is allowed to wait only if it has a timestamp larger than that of T_j (that is, T_i is younger than T_j). Otherwise, T_j is rolled back (T_j is wounded by T_i). This is
 - a) Wait-die
 - b) Wait-wound
 - c) Wound-wait
 - d) Wait

7. Which of the following is not a transaction state?
 - a) Active
 - b) Partially committed
 - c) Failed
 - d) Compensated

8. If a schedule S can be transformed into a schedule S' by a series of swaps of non-conflicting instructions, then S and S' are
 - a) Non conflict equivalent
 - b) Equal
 - c) Conflict equivalent
 - d) Isolation equivalent

9. A relation is in 2NF if:
 - a) All the values of non-key attributes are dependent fully on the candidate key.
 - b) Any non-key attribute that are dependent on only part of the candidate key should be moved to another relation where the partial key is the actual full key.
 - c) It must be already in the 1NF.
 - d) All of the mentioned

10. Which of the following is TRUE?
 - a) A relation R is in 3NF if every non-prime attribute of R is fully functionally dependent on every key of R .
 - b) Every relation in 3NF is also in BCNF
 - c) Every relation in BCNF is also in 3NF
 - d) No relation can be in both BCNF and 3NF

11. The relation employee(ID, name, street, Credit, city, salary) is decomposed into employee1 (ID, name) employee2 (name, street, city, salary) This type of decomposition is called
 - A. Lossless decomposition
 - B. Lossless-join decomposition
 - C. All of the mentioned
 - D. None of the mentioned

12. If the decomposition is unable to represent certain important facts about the relation, then such a decomposition is called as?
- Lossless decomposition
 - Lossy decomposition
 - Insecure decomposition
 - Secure decomposition
13. State true or false: Composite attributes have non-atomic domains.
- True
 - False
14. If $K \rightarrow R$ then K is said to be the _____ of R
- Candidate key
 - Foreign key
 - Super key
 - Domain
15. $X \rightarrow Y$ is trivial if?
- $X \subset Y$
 - $Y \subset X$
 - $X \supseteq Y$
 - None of the mentioned
16. Which of the following normal forms does not exist?
- BCNF
 - PJNF
 - 5NF
 - None of the mentioned
17. What action does \bowtie operator perform in relational algebra
- Output specified attributes from all rows of the input relation and remove duplicate tuples from the output
 - Outputs pairs of rows from the two input relations that have the same value on all attributes that have the same name
 - Output all pairs of rows from the two input relations (regardless of whether or not they have the same values on common attributes)
 - Return rows of the input relation that satisfy the predicate
18. Choose the option that correctly explains in words, the function of the following relational algebra expression $\sigma_{\text{year} \geq 2009} (\text{book} \bowtie \text{borrow})$
- Selects all tuples from the Cartesian product of book and borrow
 - Selects all the tuples from the natural join of book and borrow wherever the year is lesser than 2009
 - Selects all the tuples from the natural join of book and student wherever the year is greater than or equal to 2009
 - Selects all tuples from the Cartesian product of book and borrow wherever the year is greater than or equal to 2009.

19. Which of the following information does an SQL DDL not specify?
 - a) The schema for each relation
 - b) The integrity constraints
 - c) The operations on the tuples
 - d) The security and authorization information for each relation

20. Which of the following commands do we use to delete a relation (R) from a database?
 - a) drop table R
 - b) drop relation R
 - c) delete table R
 - d) delete from R

21. Which of the following is used to denote the selection operation in relational algebra?
 - a) Pi (Greek)
 - b) Sigma (Greek)
 - c) Lambda (Greek)
 - d) Omega (Greek)

22. In FROM clause, instead of table name a sub query expression may also appear-
 - a) True
 - b) False

23. If we specify multiple relations in the from clause and do not specify any conditions in the where clause, what will the result be?
 - a) The natural join of both the relations
 - b) The left outer join of both the relations
 - c) A syntactical error
 - d) The Cartesian product of both the relations

24. _____ can work on Schema Definition.
 - a) Application Programmer
 - b) Naive User
 - c) Sophisticated user
 - d) Database administrator

25. Which of the following refers to the level of data abstraction that describes exactly how the data actually stored?
 - a. Conceptual Level
 - b. Physical Level
 - c. File Level
 - d. Logical Level

26. Which of the following is a Data Model?
 - a) Entity-Relationship model
 - b) Relational data model
 - c) Object-Based data model
 - d) All of the above

27. In E-R model, weak entity set can be converted into a strong entity set by:
- using generalization
 - using aggregation
 - adding appropriate attributes
 - none of the above
28. Which of the following is a top-down approach in which the entity's higher level can be divided into two lower sub-entities?
- Aggregation
 - Generalization
 - Specialization
 - All of the above
29. Higher level entity sets are designated by the term _____
- Sub class
 - Super class
 - Parent class
 - Root class
30. For a binary many to many relationship, the _____ of the participating entity sets becomes the prime attribute
- Intersection of primary keys
 - Primary key of either one
 - Union of primary keys
 - Primary key on the many side

Section-B

(Answer any 5 questions)

Marks: (4 X 5= 20)

- Discuss the functions of various query processor components of a DBMS.
- Explain the concepts of generalization and specialization with appropriate examples.
- Explain Fully FD, partial FD, MVD, Trivial FD, Trivial MVD
- What is two-phase locking protocol? Explain some variations of two-phase locking protocol. How does two-phase locking protocol guarantee serializability?
- Explain view serializability.
- Explain the following operations with suitable example in Relational algebra – Cartesian product, Rename, Update, Intersect, union.



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