**University of Mumbai**

**Examination 2020 under cluster 4 (Lead College: PCE,New Panvel)**

**Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021**

Program: Computer Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: CSC502 and Course Name: Database Management System

Time: 2 hour Max. Marks: 80

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| **Q1.** | **Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** |
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| 1. | The physical storage structure or device could be changed without affecting the conceptual schema, this is known as \_\_\_\_\_ |
| Option A: | Physical data Independence |
| Option B: | Logical data Independence |
| Option C: | External data independance |
| Option D: | View data independance |
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| 2. | A data dictionary is a repository that manages \_\_\_\_\_ |
| Option A: | Memory |
| Option B: | Metadata |
| Option C: | Log |
| Option D: | Schema |
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| 3. | If you want to maintain and store information about your car inurance company, a car would be considered a(n) \_\_\_\_\_ |
| Option A: | Relation |
| Option B: | Entity |
| Option C: | Instance |
| Option D: | Attribute |
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| 4. | The number of entities to which another entity can be associated via a relationship set is expressed as: |
| Option A: | Entity |
| Option B: | Attribute |
| Option C: | Schema |
| Option D: | Cardinality |
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| 5. | The attribute Retiremnet\_date is calculated from DATE\_OF\_JOINING. The attribute Retirement\_date is |
| Option A: | Single Valued |
| Option B: | Multivalued |
| Option C: | Derived |
| Option D: | Composite |
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| 6. | The \_\_\_\_\_\_\_\_\_\_\_ operation, allows us to find set of all common tuples that are belonging to both Relation R and Relation S. |
| Option A: | Union |
| Option B: | Set Intersection |
| Option C: | Set difference |
| Option D: | Join |
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| 7. | The type of operation which extends the Projection operation by allowing functions of attributes to be included in the projection list. |
| Option A: | Join |
| Option B: | Union |
| Option C: | Projection |
| Option D: | Generalized Projection |
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| 8. | The operation which produces a relation R(X) that includes all tuples t[x] in R1(Z) that appears in R1 in combination with every tuple from R2(Y.) |
| Option A: | Cartesian Product |
| Option B: | Set difference |
| Option C: | Set division |
| Option D: | Join |
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| 9. | The Join operation in which it keeps every tuple in first or left relation R if no matching tuple is found in S, then the attributes of S in join result filled with NULL values |
| Option A: | Outer Join |
| Option B: | Left Outer join |
| Option C: | Right Outer Join |
| Option D: | Full Join |
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| 10. | In SQL which command is used to add new column in existing table ? |
| Option A: | Create |
| Option B: | Insert |
| Option C: | Alter |
| Option D: | Record |
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| 11. | Consider the following relation  Movies (theater,address,capacity) Which of the options will be needed at the end of the SQL query : SELECT P1.address FROM movies P1 such that it always finds the addresses of theaters with maximum capacity? |
| Option A: | WHERE P1.capacity > = All (select P2. capacity from Movies P2) |
| Option B: | WHERE P1.capacity > = Any (select P2. capacity from Movies P2) |
| Option C: | WHERE P1.capacity > All (select max (P2. capacity) from Movies P2) |
| Option D: | WHERE P1.capacity >Any (select max (P2. capacity) from Movies P2) |
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| 12. | The output of SQL statement SELECT SUBSTR('ABFJRTSKIL',6) FROM Schema; |
| Option A: | TSKIL |
| Option B: | RTSKIL |
| Option C: | SKIL |
| Option D: | KIL |
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| 13. | In SQL , the View command is declared as: |
| Option A: | define view V as <query expression>; |
| Option B: | Create V as <query expression> |
| Option C: | Create or replace view V as <query expression>; |
| Option D: | define view V like <query expression>; |
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| 14. | When a non key attribute depends on another non key attribute, it is called |
| Option A: | Functional Dependency |
| Option B: | Transitive dependency |
| Option C: | Partial dependency |
| Option D: | Automicity |
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| 15. | 2NF is |
| Option A: | every non-key attribute is fully functionally dependent on the entire primary key |
| Option B: | 1NF and every non-key attribute is fully functionally dependent on the entire primary key |
| Option C: | No transitive dependencies |
| Option D: | only atomic attributes and primary key is defined |
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| 16. | If a transaction has obtained a \_\_\_\_\_\_\_\_\_\_ lock, it can read but cannot write on the item |
| Option A: | Shared Mode |
| Option B: | Exclusive Mode |
| Option C: | Read only mode |
| Option D: | Write only mode |
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| 17. | Deadlocks are possible only when one of the transactions wants to obtain a(n) \_\_\_\_ lock on a data item |
| Option A: | Binary |
| Option B: | Exclusive |
| Option C: | Shared |
| Option D: | Complete |
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| 18. | Which of the following concurrency control protocols ensure both conflict serialzability and freedom from deadlock?  I. 2-phase locking  II. Time-stamp ordering |
| Option A: | I only |
| Option B: | II only |
| Option C: | Both I and II |
| Option D: | Neither I and II |
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| 19. | 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 |
| Option A: | Strict |
| Option B: | Equivalent |
| Option C: | Conflict Equivalent |
| Option D: | Non-Conflict Equivalent |
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| 20. | If several concurrent transactions are executed over the same data set and the second transaction updates the database before the first transaction is finished, the \_\_\_\_ property is violated and the database is no longer consistent. |
| Option A: | Automicity |
| Option B: | Consistency |
| Option C: | Durability |
| Option D: | Isolation |

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| **Q2** | **Solve any Four out of Six 5 marks each** |
| A | Discuss the roles of DBA |
| B | Explain data independence and discuss types of data independence |
| C | Explain Specialization and Generalization in EER with example |
| D | Explain different integrity constraints |
| E | Discuss the need of Normalization in Database design.Explain 3NF. |
| F | Explain deadlock with wait-for graph |

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| **Q3.** | **Solve any Two Questions out of Three 10 marks each** |
| A | Draw an E-R diagram for University database consisting of entities Student,Faculty,Department,Class.  A student has a Unique id,the student can enroll for multiple classes and has at most one major.  Faculty must belong to department and faculty can take multiple classes  Every student will get a grade for the class he/she was enrolled.  Convert E-R diagram into relational schema |
| B | Consider the employee database  *employee (employeename, street, city,date of join)*  *works (employeename, company name, salary)*  *company (company name, city)*  *manages (employee name, manager name)*  Write SQL queries for the following statements   1. Find all the employees who joined in the month of october 2. Modify the database so that ‘Anjali’ now lives in ‘Mumbai’ 3. List all the employees who live in the same cities as their managers. 4. Find all employees who earn more than the average salary of all the employees of their company 5. Give all the employees of ABC corporation a 15 percent raise. |
| C | Explain any two concurrency control protocol in database system |