ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE – 27
M.Sc. (BIG DATA ANALYTICS) – I SEMESTER
SEMESTER EXAMINATION – OCTOBER 2021
(Examination conducted in January-March 2022)
BDA 1521: DATABASE MANAGEMENT SYSTEM

Time : 2.5 HOURS   **Max Marks : 70**

This Paper contains FOUR printed pages and THREE parts

PART A

Answer ALL the Questions   **20 x 1 = 20**

1. What do you mean by one to many relationship between Teacher and Class table?
   a) One class may have many teachers
   b) One teacher can have many classes
   c) Many classes may have many teachers
   d) Many teachers may have many classes

2. Find the candidate key for R(A,B,C,D,E,F) ; FD (A->B,B->C, C->D,D->E)
   a) A
   b) AD
   c) AC
   d) AF

3. An advantage of the database management approach is
   a) Data is dependent on programs
   b) Data redundancy increases.
   c) Data is integrated and can be accessed by multiple programs.
   d) None of the above

4. DBMS helps in achieving
   a) Data independence
   b) Centralized control of data
   c) Control redundancy
   d) All of above

5. E-R model uses this symbol to represent Derived Attribute
   a) Double Ellipse
   b) Dashed Ellipse
   c) Double Rectangle
   d) Diamond

6. EER diagram notation to represent

a) Specialization
b) Subclasses
c) Subclasses and Specialization
d) None of the above

7. An attribute or combination of attributes in one table whose values must either match the primary key in another table or be null is called _____
a) Candidate key
b) Super Key
c) Primary Key
d) Foreign Key

8. Generalization is a bottom up design process that combines a number of entity sets, which share the same features into a higher level entity set
a) True
b) False
c) Can't say
d) None

9. Match the following
   A.Composite attribute   i) Attribute whose value is calculated from other attributes
   B. Multivalued Attribute ii)Attribute that can be further subdivided
   C. Derived Attribute   iii) Attribute that can have more values
a) A-i ,B-ii, C-iii
b) A-ii ,B-i, C-iii,
c) A-ii ,B-iii, C-i,
d) A-iii ,B-ii, C-i,

10. SQL Stands for
a) Sequential Query Language
b) Structured Query Language
c) Structured Question Language
d) Sequential Query Language

11. Which of the following provides the best description of an entity type?
a) A specific concrete object with a defined set of processes
b) A template for a group of things with a same set of characteristics
c) A value given to particular attribute
d) All the mentioned

12. In functional dependency, Armstrong axioms refers to
a) Transitive, Augmentation and reflexive
b) Transitive, Augmentation and decomposition
c) Augmentation, Transitive and union
d) None

13. A relation R= (A,B,C,D,E,F,G) is given with following FD : AD->E, BE->F, B->C, AF->G. Which of the following is a candidate key?
a) A
b) ABD
c) ABC
d) AB

14. Which property of the following table is not true.

a) Order of attributes has no significance
b) Order of tuples has no significance
c) Attribute can have same name
d) Each tuple is distinct

15. The maximum number of superkeys for the relation schema R(A,B,C,D) with A as key is _____
   a) 15
   b) 16
   c) 8
   d) 10

16. Find the partial dependency for the relation R (A,B,C,D,E,F) and the FD= AB->C, C->D, D->E, A->F.   (AB is a candidate key)
   a) AB->C
   b) C->D
   c) A->F
   d) D->E

17. Find the transitive dependency for the relation R(A,B,C,D,E) FD: AB->C, AB->D, C->E.
   a) AB->C
   b) AB->D
   c) C->E
   d) None

18. The following relation is in which normal form? R(A,B,C,D,E) FD: AB->C, AB->D, C->E
   a) 1NF
   b) 2NF
   c) 3NF
   d) BCNF

19. Which of the constraint can be enforced one per table?
   a) Primary key constraint
   b) Not Null Constraint
   c) Foreign Key constraint
   d) Check Constraint

20. _____ joins are SQL server default join.
   a) Inner
   b) Outer
   c) Left
   d) Right

PART B

Answer ANY SIX questions   **6 x 5 = 30**

21. What is normalization? Explain any three normal forms with example.
22. Explain CASE structure in MYSQL with example
23. Explain the 2 tier and 3tier architecture with neat diagram.
24. How cardinality enhances ER diagram? Explain the different types of it.
25. Explain insert, delete and update statements in SQL with an example

26. Give MYSQL statement which creates a STUDENT table with three records. The fields are
> Name CHAR(40),
> Class CHAR(6),
> Marks NUMBER(4),
> Rank CHAR(8)
27. Write all the inference rules with example.
28. Discuss Insertion, Update and deletion anomalies. Why they are considered bad? Illustrate with example.

PART C

Answer ANY TWO questions   **2 x 10 = 20**

29. Consider the following schema:
> Suppliers(sid: integer, sname: string, address: string)
>
> Parts(pid: integer, pname: string, color: string)
>
> Catalog(sid: integer, pid: integer, cost: real)

The key fields are underlined, and the domain of each field is listed after the field name. Thus sid is the key for Suppliers, pid is the key for Parts, and sid and pid together form the key for Catalog. The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL.
   a) Find the names of suppliers who supply some red part.
   b) Find the sids of suppliers who supply some red or green part.
   c) Find the sids of suppliers who supply some red part and some green part.
   d) Find the sids of suppliers who supply every part.
   e) Find the sids of suppliers who supply every red part.
30. Consider the following information about a university database:

➤ Professors have an SSN, a name, an age, a rank, and a research specialty.

➤ Projects have a project number, a sponsor name (e.g., NSF), a starting date, an
    ending date, and a budget.

➤ Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S.
    or Ph.D.).

➤ Each project is managed by one professor (known as the project's principal
    investigator).Each project is worked on by one or more professors (known as the
    project's co-investigators).

➤ Each project is worked on by one or more graduate students (known as the
    project's research assistants).

➤ When graduate students work on a project, a professor must supervise their work
    on the project. Graduate students can work on multiple projects, in which case
    they will have a supervisor for each one.
    Design and draw an ER diagram that captures the information about the university.

31. Explain in detail about Hierarchical model, Network model and Object oriented model
    with example.