Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 70785

M.C.A. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
First Semester
MC5103 – DATABASE MANAGEMENT SYSTEMS
(Regulations 2017)

16/12/19 FN

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What are the various types of attributes.
2. Differentiate primary key and foreign key.
3. Write the structure of a SQL query.
4. What is functional dependency ?
5. Define serializability. Name its types.
6. What are the types of locks used in concurrency control ?
7. What is the difference between B tree and B+ tree ?
8. Differentiate static and dynamic hashing.
9. What is XML ? Give its structure.
10. What is the need for database tuning ?

PART – B (5×13=65 Marks)

11. a) i) Discuss the advantages of Database Systems over File Processing System ? (6)

ii) With a help of a neat diagram, explain the architecture of DBMS. (7)

(OR)

b) i) Explain the various types of database users. (6)

ii) Draw the ER diagram for Library Information System. (7)

12. a) i) Explain the concept of functional dependency with suitable example. (6)

ii) Elaborate relational algebra with its basic operations. (7)

(OR)

b) i) Briefly explain Tuple Relational Calculus. (6)

ii) Discuss in detail about 1NF, 2NF and 3NF with suitable example. (7)

13. a) i) Define transaction. Explain the ACID properties of a transaction. (6)

ii) Brief out the role of time stamp ordering in concurrency control. (7)

(OR)

b) i) Discuss about how locking mechanism is used for concurrency control. (6)

ii) Explain how shadow paging concept is used for recovery mechanism. (7)

14. a) i) With diagram, discuss single level and multi-level indexes. (6)

ii) Explain in brief about static and dynamic hashing with example. (7)

(OR)

b) i) With suitable example, explain the structure of B+ tree. (6)

ii) Compare sparse index and dense index with example. (7)

15. a) i) Discuss about the key features of NOSQL. (6)

ii) Compare and contrast Object Relational Databases and RDBMS with suitable examples. (7)

(OR)

b) i) Explain about various Hbase data operations. (6)

ii) Differentiate structured and unstructured data. Give the structure of XML. (7)

PART – C (1×15=15 Marks)

16. a) i) Consider the following database schema : (10)

Patient (P_id, P_name, P_gender, P_age, P-disease)

Doctor (D_id, D_name, D_dept, D_specialization)

Treatment (P_id, D_id, date)

Solve the following using SQL

1) Print the name of the 'female' patient who is suffering from cancer.
2) Print the name of the patient who got treatment on 13-3-2019.
3) Print the name of the doctor who gave treatment for malaria.
4) How many patients were treated on 12-3-2019 ?
5) Print the name of the doctor who hasn't given treatment on any patient.

ii) Draw an ER diagram using generalization, specialization and aggregation. **(5)**

(OR)

b) i) Construct a B+ Tree with the following data : **(10)**

Key values – (2, 3, 5, 7, 11, 17, 19, 23, 29, 31)

Illustrate the step wise insertion in the B+ Tree.

ii) Write a brief note on Deadlock Handling in Transactions. **(5)**