

SH-IV/Com.Sc./403/C-10/19**B.Sc. 4th Semester (Honours) Examination, 2019****COMPUTER SCIENCE****(Database Management System)****Paper : 403/C-10****Course ID : 41513****Time: 1 Hour 15 Minutes****Full Marks: 25***The figures in the right hand side margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**The figures in the right hand side margin indicate marks.**The questions are of equal value.*

1. Answer *any five* of the following: 1×5=5
 - (a) Define DBMS.
 - (b) Write two advantages of relational model of a database.
 - (c) Define Primary Key. How you can convert an weak entity set into a strong entity set?
 - (d) Write two differences between DDL and DML.
 - (e) What is functional dependency?
 - (f) What is Metadata? Give example.
 - (g) What is meant by data redundancy?
 - (h) What is foreign key?

2. Answer *any two* of the following: 5×2=10
 - (a) What is transaction? Explain ACID properties of a transaction. 1+4=5
 - (b) What is meant by normalization of a database relation? Why do we have to make relations normalized? Define 3NF. 1+2+2=5
 - (c) How data is stored in a B + tree file structure of a DBMS. Explain the pros and cons of a B + tree file structure of a DBMS. 2+3=5
 - (d) Explain with an example how presence of partial and transitive dependencies in relations influence the database design. 5

3. Answer *any one* of the following: 10×1=10
 - (a) What is DBA? Explain the functions of DBA. Briefly explain the 3-tier architecture of a DBMS. 1+4+5=10

- (b) Consider the following relational schema and answer following queries in relational algebra as well as in SQL:

Employee (*Person-Name*, Street, City)

Works (Person-Name, Company-Name, Salary)

Company (*Company-Name*, City)

Manages (Person-Name, Manager-Name)

- (i) Find the name of all employees who work for first bank Corporation.
- (ii) Find the name, street address and cities of residence of all employees who work for first bank Corporation and earn more than Rs. 10,000 per month.
- (iii) Find the name of all the employees who live in the same city as the Company for which they work.
- (iv) Give all managers a 10% salary raise, unless the salary would be greater than Rs. 100,000. In such a case give only a 3% raise.
- (v) Find the company with the most employees.

2×5=10
