

**2021**

**STATISTICS — GENERAL**

**Paper : SEC-B-1**

**(Database Management Systems)**

**Full Marks : 80**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer **any fifteen** of the following : 2×15
- (a) What is DBMS?
  - (b) What do you mean by durability in DBMS?
  - (c) Define weak and strong entities.
  - (d) What do you mean by database constraint?
  - (e) What is DDL?
  - (f) Define Procedural and non-procedural DML.
  - (g) What do you mean by object-relational model?
  - (h) Define primary key and candidate key with example.
  - (i) What is view in SQL?
  - (j) What do you mean by domain constraint?
  - (k) What is relational algebra?
  - (l) Define logical data independence.
  - (m) What is RDBMS?
  - (n) What are tables and fields in database?
  - (o) Write an SQL query to find names of student starting with 'M'.
  - (p) What is subquery in SQL?
  - (q) Define a relation schema and a relation.
  - (r) What are the unary operations in relational algebra?
  - (s) What is degree of relation?
  - (t) What are the disadvantages of DBMS?

**Please Turn Over**

2. Answer **any six** of the following :

5×6

- (a) What do you mean by DA and DBA? How do they differ?
- (b) How DBMS differs from traditional file processing system?
- (c) What do you mean by data model? What are conceptual, physical and representational data model?
- (d) Describe different types of relationships in a database by example.
- (e) Describe theta join, left outer join, right outer join and full outer join with example.
- (f) Explain the ACID property in a database.
- (g) What is SQL? Explain its different data types.
- (h) Differentiate between DBMS and RDBMS.

3. Answer **any two** of the following :

- (a) What do you mean by data abstraction? Give an example. Explain the different levels of data abstraction by example. 2+2+6

(b) Consider the following relation :

College(Cname, State, EnrollNo)

Student(Sid, Sname, Marks)

Application(Sid, Cname, major)

Write the following queries in SQL :

- (i) Find applications to 'XYZ' college as Statistics major.
- (ii) List id and name of the student with marks greater than 60.
- (iii) List name of the students with marks greater than 80 who applied to "Computer Science" at any college.
- (iv) Illustrate theta join over students and apply table with Sid. 2+2+3+3
- (c) Create the following tables, properly implement the integrity constraints and execute the following queries (insert values in such a manner that every query gives at least an output) :

TEACHER(tid, tname, address, gender, dept)

STUDENT(sid, sname, scity, age)

TAUGHT\_BY(tid, sid, subject)

Write the SQL commands to perform the following:

- (i) List all the students within age group 16 to 21 years.
- (ii) Find the name of teachers who teach Statistics.
- (iii) Count the total number of students in the Mathematics department.
- (iv) Find the name of students who live in Kolkata.
- (v) Find the name and address of lady teachers. 2+2+2+2+2