WEST BENGAL STATE UNIVERSITY

B.Sc. General PART-II Examinations, 2018

COMPUTER SCIENCE-GENERAL

PAPER-CMSG-III-A

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

1. Answer any ***five*** questions from the following: 2×5 = 10
   (a) What is the objective of Software Design phase?
   (b) Define Black Box testing.
   (c) What is referential integrity constraint?
   (d) What is Functional dependency?
   (e) What is derived attribute? Explain with example.
   (f) Define Natural join of two relations in RDBMS.
   (g) Define Second Normal Form (2NF).
   (h) Define Select and Project operations, used in Relational Algebra.

Group-A

Answer any ***one*** question from the following 8×1 = 8

2. (a) State the characteristics of a good SRS. 4
   (b) Write a brief note on different software quality factors. 4

3. (a) What is the purpose of DFD? 2
   (b) Define Synchronous DFD and Asynchronous DFD. 3
   (c) Define Software Verification and Software Validation. 3

Group-B

Answer any ***four*** questions from the following 8×4 = 32

4. (a) Define Strong Entity Set and Weak Entity Set. Explain with example. 3
   (b) Define Cardinality Constraints and Participation Constraints which are specified in ER diagram. 3
   (c) Define candidate key. 2

5. (a) What is the necessity of Normalization? 2
   (b) Give an example of a relational schema which is in 3NF but not in BCNF. 4
   (c) When two sets of functional dependencies are said to be equivalent? 2

6. (a) Consider the following schema of a relational database: 2×4

   sailors (sid, sname, rating, age)
   reserves (sid, bid, day)
   boats (bid, bname, colour)

   Express the following Queries in SQL

   (i) Find the names of sailors who have reserved a green boat.
   (ii) Find the names of sailors who have reserved a boat having id 23.
   (iii) Find the names of sailors who have reserved at least two boats.
   (iv) Find the names of sailors having age more than 25 and reserved a red boat.

7. (a) Explain left outer join and right outer join with example. 4
   (b) Define Ternary relationship. Explain with ER diagram. 4

8. (a) Define DDL and DML. 4
   (b) What is Data Dictionary? 2
   (c) Why SQL is called relationally complete? 2

9. Consider the following relational schema for a library. 2×4

   member (memo-no, name, date)
   books (isbn, title, authors, publishers)
   borrowed (memo-no, isbn, date)

   Write the following queries in relational algebra.

   (i) Find the name of members who have borrowed all books published by "McGraw-Hill".
   (ii) For each publisher, find the name and membership number of members who have borrowed more than five books of that publishers.
   (iii) Find the names of members who have borrowed any book published by "McGraw-Hill" and "Pearson".
   (iv) Find the average number of books borrowed per member.

10. Write short notes on any ***two*** of the following: 4+4

   (i) Index Sequential File Organization
   (ii) Relational Algebra and Relational Calculus
   (iii) Generalization in ER model
   (iv) Data Abstraction in DBMS.