



WEST BENGAL STATE UNIVERSITY

B.Sc. General Part-II Examination, 2021

COMPUTER SCIENCE

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.

All symbols are of usual significance.

1. Answer any **five** questions from the following: 2×5=10
 - (a) How can we derive the size of software product?
 - (b) What are software metrics?
 - (c) What do you mean by transparent DBMS?
 - (d) What are the unary operations in Relational Algebra?
 - (e) What is level-O DFD?
 - (f) What is data dictionary?
 - (g) What is a degree of Relation?
 - (h) What is DML?

GROUP-A

Answer any **one** question from the following

8×1 = 8

2. (a) For a given relation R-(A, B, C, D, E, F), consider $F=\{A \rightarrow B, A \rightarrow C, CD \rightarrow E, CD \rightarrow F, B \rightarrow E\}$. Find the closure of F. 4
 - (b) Explain the various keys in DBMS. 4
3. (a) Discuss the phases of static testing. 4
 - (b) What are the major objectives of black-box testing? 4

GROUP-B

Answer any **four** questions from the following

8×4 = 32

4. (a) Define 1NF, 2NF and 3NF with suitable examples.
 - (b) What do you mean by lossless join? Explain with example. 5+3 = 8
5. (a) What is the purpose of GROUP BY, ORDER BY and HAVING clause in the SELECT statement? (2+2+2)
+ 2 = 8
 - (b) What is a view?

6. Consider the following schema of a relational database: 2×4 = 8
employee (e_name, street, city)
works (e_name, company_name, salary)
company (company_name, city)
manager (e_name, manager_name)
Write the following queries in SQL:
(a) Find all employees who live in the same city as the companies for which they work.
(b) Find all employees who live in the same city and on the same street as do their respective manager.
(c) Find all employees who earn more than the average salary of all employees of their company.
(d) Find the company that has the smallest payroll.
7. Consider the following schema: 2×4 = 8
SUPPLIER (Sid, S_name, S_address)
PARTS (Pid, P_name, Color)
CATALOG (Sid, Pid, Cost)
Answer the following queries in Relational Algebra:
(a) Find the name of all the suppliers who supply yellow parts.
(b) Find the name of suppliers who supply both Blue and Black parts.
(c) Find the name of suppliers who supply all parts.
(d) Find the address of suppliers who supply more than one project.
8. (a) What is ER-modeling? What are its drawbacks? (2+2)+4=8
(b) Draw an ER-diagram for library system.
9. (a) List the advantages of DBMS over file organization. 4+4 = 8
(b) Write the functions of DBA.
10. Write short notes on any **two** of the following: 4×2 = 8
(a) Aggregation
(b) Normalisation
(c) Hierarchical Data Model
(d) SQL.

N.B. : Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.

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