

2022

M.Sc.

2nd Semester Examination

COMPUTER SCIENCE

PAPER—COS-201

ADVANCED DATABASE MANAGEMENT SYSTEM

Full Marks : 50

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Group - A

Answer any four questions.

4×2

1. What are the disadvantages in File Processing System?

(Turn Over)

2. Define the "Referential Integrity".
3. Name and briefly describe the five SQL built-in functions.
4. What is Data Model? Give examples.
5. What is Weak Entity set?
6. State Lossless join property.

Group - B

Answer any *four* questions. 4×4

7. Discuss the external view, internal view in three-tier database architecture. 4
8. Define BCNF. How does it differ from 3NF? 1+3
9. Explain with examples the terms Super key, Candidate key and Primary key. 4
10. Define a foreign key. Why do you need it? 1+3

11. Discuss about multi-valued dependency.
Give examples. 2+2
12. What is normalization? What is the necessity
of it? 1+3

Group - C

Answer any *two* questions. 2x8

13. Discuss the 'insertion anomalies', 'update anomalies' and 'deletion anomalies' with respect to normal forms with suitable example and suggest a method to overcome them. 8
14. Construct an E-R Diagram for the following problem :

Consider the design of a database for the management of grants. Each grant is identified by a unique grant ID, a title, the funding source of the grant, the period (starting date and ending date), and the amount of grant. Each grant might be participated by several professors and each professor might also participate in several grants. Each professor is identified by a unique SSN, name, and email address. In addition, several graduate students might be supported by a grant

as GRAs, although each student can be supported by at most one grant. Each graduate student has exactly one professor as his/her advisor. 8

15. (a) Why is BCNF considered as stronger than 3NF?

(b) Given a relational schema

supply (Sno, City, Status, Pno, qty) with FD set

$F = \{Sno \rightarrow City, City \rightarrow status, \{Sno, Pno\} \rightarrow qty\}$

Find the key of the schema. Also reduce it into 3NF. 3+5

16. (a) Draw transaction state diagram and describe each state that a transaction goes through during its execution.

(b) What is 2-phase locking protocol? 6+2

[Internal assessment - 10]
