II-UG-C1-Maj—C.Sc.-IV

UG 2nd Semester Examination, 2026(Reg)

COMPUTER SCIENCE

Full Marks : 100

Time : 3 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

PART – I

1. Answer *all* questions : 1 × 10

i. The person responsible for overall control of a database system is _____.

a. Programmer

b. End User

c. Database Administrator (DBA)

d. Operator

ii. Which of the following is a conceptual data model ?

a. ER Model
b. Network Model
c. Relational Model
d. Hierarchical Model

iii. An attribute that uniquely identifies an entity is called _____.

a. Composite Key
b. Foreign Key
c. Primary Key
d. Candidate Key

iv. A column in a relation is called _____.

a. Tuple
b. Attribute
c. Domain
d. Key

v. Which SQL statement is used to retrieve data ?

a. FETCH
b. SELECT
c. GET
d. RETRIEVE

vi. The SELECT operation in relational algebra is represented by _____.

a. Π
b. σ
c. $\bowtie$
d. $\div$

vii. BCNF is stronger than _____.

a. 1NF
b. 2NF
c. 3NF
d. All of these

viii. ACID stands for _____.

a. Atomicity, Consistency, Isolation, Durability
b. Accuracy, Consistency, Integrity, Durability
c. Atomicity, Control, Isolation, Data
d. Access, Consistency, Isolation, Durability

ix. Which technique is most commonly used for concurrency control ?

a. Locking
b. Compression
c. Sorting
d. Encryption

x. A schema describes _____.

a. Current data in database
b. Structure of the database
c. Hardware configuration
d. User privileges

PART-II

2. Answer *all* questions. The answer should be within *50* words : 2 × 9

a. What is a data model ?

b. What is a multivalued attribute ?

c. Define cardinality ratio.

d. What is a foreign key ?

e. What is the DEFAULT constraint ?

f. What is transitive dependency ?

g. What is deletion anomaly ?

h. Define concurrent schedule.

i. What is deadlock ?

PART-III

3. Answer any *eight* questions within *250* words : 5×8

a. Explain the components of an ER model with examples.

b. Explain the three-schema architecture of a database system.

c. Explain different SQL data types with examples.

d. Discuss different retrieval queries in SQL.

e. Explain JOIN operation and its types.

f. Explain Third Normal Form (3NF) with an example.

(*Continued*)

g. Discuss the role of normalization in database design.

h. Define serializability and explain its significance.

i. Discuss transaction recovery concepts.

j. Define a transaction and explain its states.

PART-IV

4. Answer any *four* questions within *800* words : 8×4

a. Describe various data models used in database systems with examples.

b. Discuss INSERT, UPDATE and DELETE commands with examples.

(*Turn Over*)

c. Explain functional dependency and its types with suitable examples.

d. Explain locking techniques used for concurrency control.

e. Discuss the database design process and conceptual modelling.
