Rani Rashmoni Green University

M.Sc. Computer Science End Semester Exam-2025

Subject: Computer Science

Course code: COS-102 (Advanced DBMS)

FM = 40 marks

1. Answer any four out of six questions from the following: 2×4=8

a) What is importance of Normalization in DMBS?

b) State the functions of Lock Manager.

c) Define: Serializability.

d) What is Multivalued Dependency?

e) What are the drawbacks of a Distributed Database System.

f) State the essential conditions of dead lockin DBMS?

2. Answer any four out of six questions from the following: 4×4=16

a) Give an example of a relation that is in 3NF but not in BCNF.

b) What are the different anomalies in database management systems?

c) Explain various database recovery techniques citing appropriate examples.

d) What is the difference between a shared lock (S-lock) and an exclusive lock (X-lock)?

e) Explain the difference between conflict serializability and view serializability.

f) Explain time stamp ordering protocol by citing appropriate examples.

3. Answer any two out of four questions from the following: 2×8=16

a) What is a transaction?Explain the ACID properties of transactions by citing appropriate examples.(2 + 6)

b) Explain functional, partial, and transitive dependencies citing appropriate examples. Describe lossless decomposition.(2+2+2+2)

c) Let $R=(A,B,C,D,E,F)$ bearelationwiththefollowingdependencies $C \rightarrow F$, $E \rightarrow A$, $EC \rightarrow D$, $A \rightarrow B$.Find all the candidate keys.Give an example of Relation which is in 1st normal form (1NF).(6+2)

d) Distinguish between basic 2PL,strict 2PL,andrigorous 2PL.(2+2+2)