

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -I EXAMINATION- 2026

B.Tech-III Semester (CSE/IT/BT/ECE/CE)

COURSE CODE (CREDITS): 18B11CI313

MAX. MARKS: 15

COURSE NAME: DATABASE MANAGEMENT SYSTEMS

COURSE INSTRUCTOR: GAURAV NEGI

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	(a) Explain the Referential Integrity Constraint. Describe what actions a database engine executes under CASCADE, SET NULL, and RESTRICT when a referenced primary key tuple is deleted or modified. (b) Given the relational schema Student(Roll_No, Email, Aadhaar_No, Name), identify one valid Super Key (other than a candidate key alone) and one Candidate Key.	1	2+1
Q2	Consider a Library Management System with entities Book(ISBN, Title, Price, Author), Member(Member_ID, Name (First_Name, Last_Name), DOB, Age), and Publisher(Publisher_Code, Name, Address). (a) Identify and classify the given attributes into: Key, Composite, Multivalued, and Derived attributes. (b) Specify the representation (entity sets, relationship set with descriptive attribute, cardinality ratios, and participation) required to draw the complete E-R diagram for the 1:M Published_By relationship (Book to Publisher) and N:M Borrows relationship (Member to Book with attribute Issue_Date).	2	2+3
Q3	Consider entity sets E1(Emp_ID, Name(First_Name, Last_Name), Skill) and E2(Dept_ID, Dept_Name), where Skill is a multivalued attribute, and R1 (Works_In) is a M:1 relationship from E1 to E2 with total participation from E1.	3	1+3

	(a) State the minimum number of relational tables needed to map this model without introducing redundancy or null values. (b) Write the complete relational schemas for all resultant tables. Clearly underline Primary Keys (PK) and denote Foreign Keys (FK).		
Q4	Differentiate between Logical Data Independence and Physical Data Independence. State which schema level mapping in the ANSI/SPARC Three-Schema Architecture provides each type of independence.	1	3