

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: IMSC
BRANCH: MATHEMATICS**

**SEMESTER : VI
SESSION : SP/2025**

SUBJECT: CS325 DATABASE MODELLING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Construct an ER diagram for a banking database Identifying the Entities, their Relationship, Attributes, mapping cardinalities, Weak entity and their participation constraints.	[5] 1	4
Q.1(b)	What are the fundamental operations performed in Relational algebra? Show with examples. Also prove that the set intersection operation can be achieved by applying some fundamental operation of relational algebra.	[5] 1	3
Q.2(a)	Explain the conversion of Ternary relationships with varying mapping cardinalities to SQL with suitable examples	[5] 2	2
Q.2(b)	Show that how Entity clustering is done for the E- R Models.	[5] 2	3
Q.3(a)	Define 3NF and BCNF. Compare them with suitable example explaining their significance for database design.	[5] 3	3
Q.3(b)	Write an algorithm for finding the minimal cover F for the set of dependency G. Also trace the algorithm for a given dependency set to find its minimal cover.	[5] 3	3
Q.4(a)	What are the key features of a Data Warehouse? Distinguish between operational database systems and data warehouses.	[5] 4	3
Q.4(b)	What are the basic OLAP operations? Also Draw a diagram showing a plan for the Query Optimization for OLAP.	[5] 4	3
Q.5(a)	How are CASE tools used for Application life-cycle tooling integration? Explain and show using an example diagram.	[5] 5	3
Q.5(b)	What is XML? Show with example that how it models the data.	[5] 5	2

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