Roll Number: _____

Thapar Institute of Engineering and Technology, Patiala

Department of Computer Science and Engineering

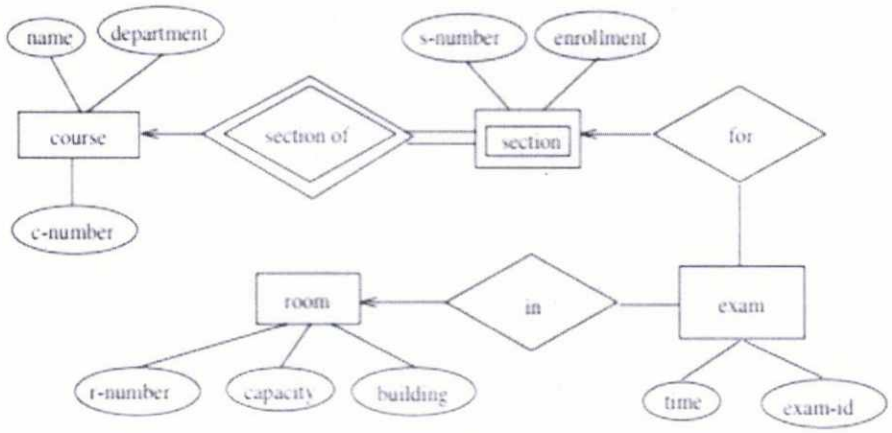
Auxiliary Examination

B.E (Auxiliary Examination) Course Code: UCM003

Aug 31, 2023 Course Name: Database Management Systems (Minor)

Time: 3 Hours, M. Marks: 100 Name of Faculty: Dr. Sanjeev Rao

Note: Attempt all questions with proper justification. Assume missing data, if any, suitably. Explain all the problems in the context of theory and figures and mathematical Notations.

Q1.	Convert the following E-R diagram to Tables. Explicitly mention primary and foreign key for each table: 	(10)
Q2.	Given a relational Schema R(W, X, Y, Z) and set of Function Dependencies. FD = { W → X, Y → X, Z → WXY, WY → Z }. Find the canonical cover?	(10)
Q3.	When is the concept of a weak entity used in data modeling? Define the terms owner entity type, identifying relationship, and partial key.	(5+2+2+1)
Q4.	a) Explain normalization in the context of database design? b) Describe the process of 3NF, highlighting its importance in maintaining data integrity. Provide relevant examples.	(5+5)
Q5	Explain the following: a) Dbms Three tier architecture b) Types of outer join operations	(5+5)

Q6.	Write the SQL statements to answer the given queries using following relations of a book club Members(Member_id,Name,Designation,Age) Books(book_id,Book_title,Book_author , Book_Publisher , Book_price) Reserves(Member_id, Book_id, Date) a) Find the names of members who are professors and older than 45. b) List the titles of books reserved by professors. c) Find IDs of members who have not reserved books that cost more than Rs 500. d) Find the authors and titles of books reserved on 27-may-2007	(4x5=20)
Q7.	a) Explain the concepts of transaction isolation and serializability. b) Discuss different levels of transaction isolation and provide examples of scenarios where each level is appropriate.	(5+5)
Q8.	a)Discuss the ACID properties in the context of the transaction. b) Which of the following schedules is conflict serializable? c) Determine the equivalent serial schedules. a. $r_1(X); r_3(X); w_1(X); r_2(X); w_3(X);$ b. $r_1(X); r_3(X); w_3(X); w_1(X); r_2(X);$ c. $r_3(X); r_2(X); w_3(X); r_1(X); w_1(X);$ d. $r_3(X); r_2(X); r_1(X); w_3(X); w_1(X);$	(4+8+8)