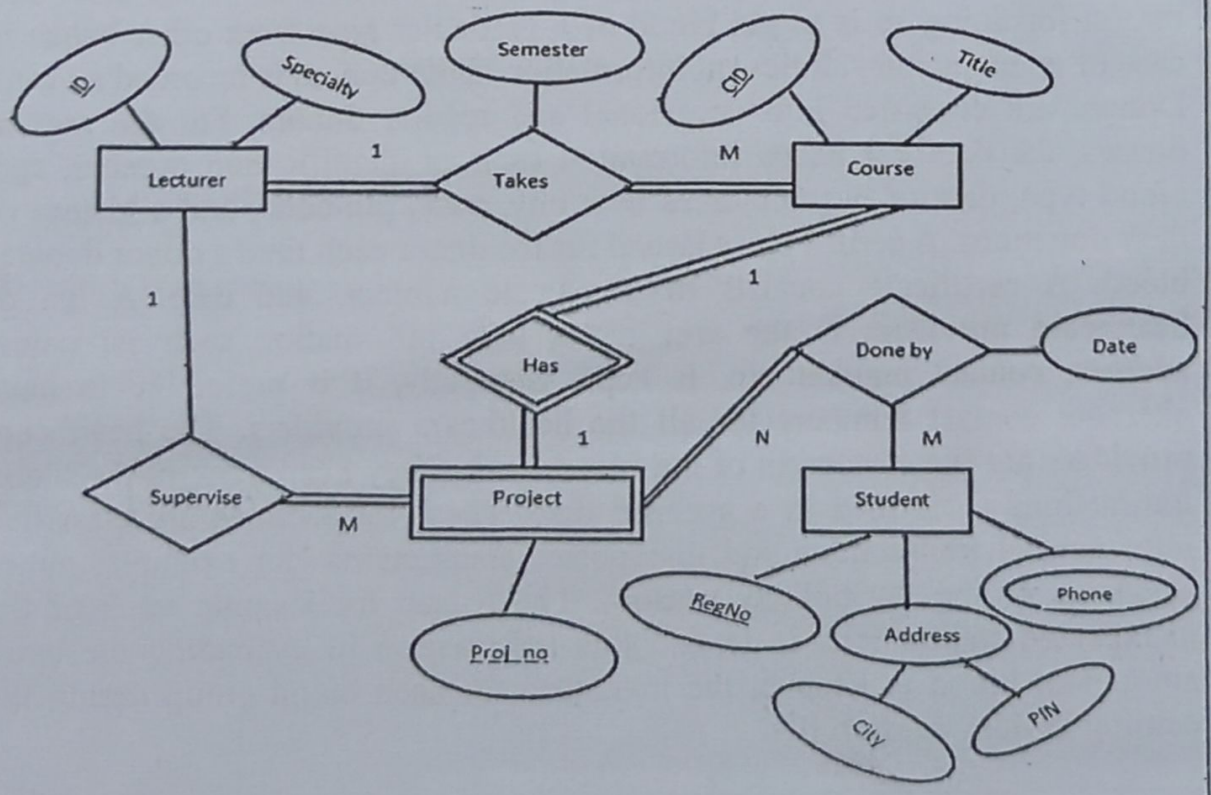
Reg. Number:	22BAI1266

VIT
Vellore Institute of Technology
CHENNAI

Continuous Assessment Test (CAT) – I - FEB 2024

Programme	:	B.Tech. CSE and its specialization	Semester	Winter 2023-24
Course Code & Course Title	:	BCSE302L / Database Systems	Slot	D1+TD1
Faculty	:	Dr. Jenila Livingston L M Dr. Balasundaram A Dr. Amrit Pal Dr. Leninisha Shanmugam Dr. Abishi Chowdhury Dr. Sandhya	Class Number	CH2023240501571 CH2023240501561 CH2023240501565 CH2023240501567 CH2023240501563 CH2023240501560
Duration	:	1 Hr 30 Mins	Max. Marks	50

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Suppose you have a university database with the following entity sets: **College**(College_ID, College_Name, School_ID) **School** (School_ID, School_name, Faculty_ID) **Student** (Student, Course_name, Course _code, Faculty_ID) **Faculty** (Faculty_ID, Faculty_Name, Phone_no, Email) For the given scenario, explain how the tuples will be organized using any two data models. [4*2=8 marks] **Note:** Do not consider ER/EER models for answering this question.	8
2		Consider the following ER diagram. Convert it into its equivalent relational model. 	8

3		Perform all the specified operations over the three relations given using SQL queries: **Employee** **Attribute Name** / **Constraints** EMPID — Primary Key NAME — Not Null, should start with 'Mr.' SALARY — Check (>= 20000) DEPTID — Foreign Key (references Department) PID — Foreign Key (references Project) **Department** **Attribute Name** / **Constraints** DEPTID — Primary Key DEPTNAME — Unique DLocation — Default (Chennai) **Project** **Attribute Name** / **Constraints** PID — Primary Key PName — Not Null DEPTID — Foreign Key (references Department) a) Create the above relations in the appropriate order with the mentioned constraints. (5 Marks) b) Demonstrate 3 instances of constraint violations while inserting the data. (3 Marks) c) Show the empid of all employees whose salary is greater than 50000. (1 Mark) d) Show the empid and employee name of employee drawing the highest salary. (1 Mark) **NOTE:** Read all the questions first, then, insert necessary data.	10
4		Consider the following paragraph. Make all relevant assumptions with valid cardinalities, participation etc and create a neat sketch of ER / EER model for the given scenario: Blood bank is a critical entity in providing required type of blood to the patients at critical time. Their database keeps track of the inventory of the blood, together with relevant information like blood group, date received, location, date of expiry, donor, etc. The database keeps information such as name, address, and telephone number of other blood banks in the area. The reason for doing so is to get blood of a particular type from other banks in case of an emergency. Relevant information about donors is recorded as well. Donors are classified into occasional and regular donors. For the regular donors, the database keeps information such as identification number, age, blood type, date of birth, address with city, state, pin-code, and a history of their donations. A certificate is issued for the donor each time a donor donates blood. A certificate consists of certificate number, and date. A list of healthcare providers in the area along with information such as: name, address, contact number etc. is kept. Generally, it is preferable to have alternate contact numbers for all the healthcare providers. The healthcare providers are the customers of the blood bank. They keep track of the blood transactions performed in a specific date. These transactions are classified into: normal transactions and unexpected transactions (for example, motor accidents during the holiday season). The reason for keeping track of the unexpected transactions is to use this information in estimating the extra amount of blood to keep in the inventory for each blood group during the coming holiday season.	12

5	a	Given a relation R (C,U,S,T,O,M) with the following eight functional dependencies: F: {CU → S; T → OM; S → C; UO → S; US → T; SM→ UT; CST → U; SO → CM}. For the following statements, decide whether they are true or false and also justify your answer with a proper explanation. i) The closure of 'US' is {C, T, O, M} (1 mark) ii) 'CUS' is a super key of 'R' (1 mark) iii) 'US' is a candidate key of 'R' (2 marks) iv) We can derive a new functional dependency 'CUS->TO' from F (1 mark) v) The closure of 'SO' covers >=5 attributes and 'T' covers <=3 attributes (1 mark) vi) US → T is a trivial dependency (1 mark)	12
	b	Find the minimal cover of F (5 marks)	

**********All the best **********