



VIT

Vellore Institute of Technology
Affiliated to University of Madras, Chennai, Tamil Nadu, India
CHENNAI

Reg.
Number

22BPI224

Continuous Assessment Test I – February 2024

Programme	B.Tech, CSE and its specialization	Semester	Winter 2023-24
Course Code & Course Title	BCSE302L / Database Systems	Slot	D2+TD2
Faculty and Class Number	Dr A Muralidhar Dr. L.Jani Anbarasi Dr. Abishi Chowdhury Dr. Amrit Pal Dr. Leninisha shannugam Dr. L.M. Jenila Livingston Dr. G. Logeswari	Class Number	CH2023240501557 CH2023240501562 CH2023240501564 CH2023240501566 CH2023240501569 CH2023240501572 CH2023240503346
Time	1½ Hours	Max. Marks	50

Answer ALL the Questions

Q. No.	Sub-division	Question Text	Marks																																										
1	a) b)	<p>Assume you have to create an e-library database system. As per your perception, which will be the best suitable database architecture for storing and retrieving relevant data? Justify your choice with suitable example. (4 Marks)</p> <p>Suppose you have a very less or no idea of DBMS. Still you are working in XYZ bank and are using banking database. Which role are you playing there as the database user? Which kind of user are you? Justify your answer. (3 Marks)</p>	7																																										
2		Assume that you are a database administrator for an IT company. The company needs creation and maintenance of large database. The company has assigned you various responsibilities beginning from designing the database, implementing and managing database of the company. Draw a neat sketch and deliberate the roles and duties of the database administrator with respect to various levels of three-schema architecture. (8 Marks)	8																																										
3	a)	<p>Consider the following relations:</p> <p>EmployeeInfo</p> <table border="1"> <thead> <tr> <th>EID</th> <th>Fname</th> <th>Lname</th> <th>Department</th> <th>Project Id</th> <th>Office Address</th> <th>Gender</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Raju</td> <td>M</td> <td>HR</td> <td>P1</td> <td>Hyderabad</td> <td>M</td> </tr> <tr> <td>102</td> <td>Alex</td> <td>J</td> <td>Admin</td> <td>P2</td> <td>Delhi</td> <td>F</td> </tr> <tr> <td>103</td> <td>Fen</td> <td>S</td> <td>Account</td> <td>P3</td> <td>Mumbai</td> <td>M</td> </tr> <tr> <td>104</td> <td>Babu</td> <td>H</td> <td>HR</td> <td>P1</td> <td>Hyderabad</td> <td>F</td> </tr> <tr> <td>105</td> <td>Sanjay</td> <td>S</td> <td>Admin</td> <td>P2</td> <td>Delhi</td> <td>M</td> </tr> </tbody> </table>	EID	Fname	Lname	Department	Project Id	Office Address	Gender	101	Raju	M	HR	P1	Hyderabad	M	102	Alex	J	Admin	P2	Delhi	F	103	Fen	S	Account	P3	Mumbai	M	104	Babu	H	HR	P1	Hyderabad	F	105	Sanjay	S	Admin	P2	Delhi	M	10
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EmployeePosition		DateOfJoining	Salary
ID	Position		
101	Manager	01/05/2005	50000
102	Executive	02/05/2009	75000
103	Manager	01/05/2016	
102	Lead	02/05/2017	85000
101	Executive	01/05/2022	30000
107	Lead	22/05/2005	Ten

Write the SQL query for the following:

- Create the table EmployeeInfo and EmployeePosition with all the attributes given in the table. EID acts as the primary key for the EmployeeInfo table. Identify the foreign key of EmployeePosition table. EID of the table holds an integer datatype and other fields are characters in EmployeeInfo Table. Similarly, EmployeePosition table ID and Salary hold integer, Position should be character, and DateOfJoining should be of Date datatype. (3 Marks)
- Insert two records using the corresponding fields of the table (do not use values in the SQL query). Identify the violations that occur during the insertion of the records. (3 Marks)
- Include two attributes Age and Project Name in the existing EmployeePosition relation. Set the constraints accordingly where Age should accept values only between 21 and 32, and projectName cannot be Null. (2 Marks)
- List the EID order by their first name in descending order in the EmployeeInfo relation. (2 Marks)

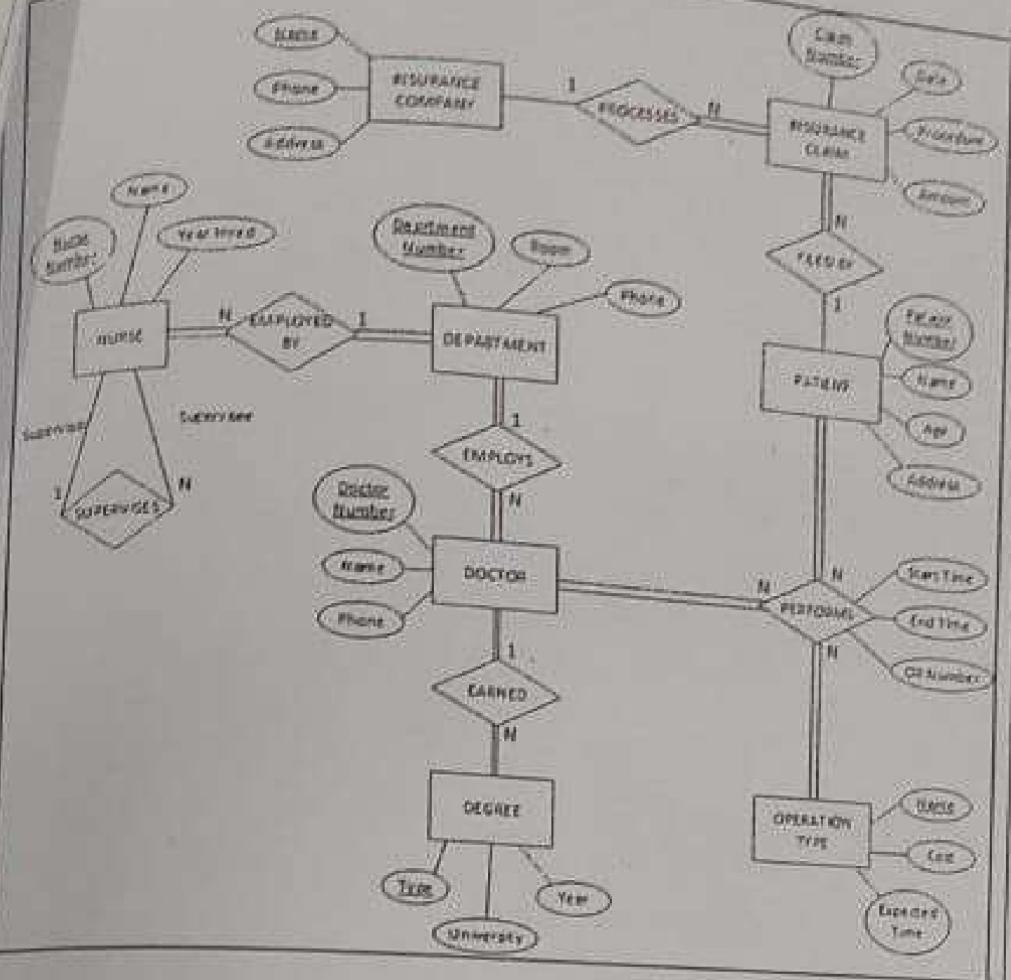
a) Consider the given scenario and draw the ER diagram. (7 Marks)

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Otto hosts a fashion show exclusively for suits, in which many costume designers and models compete for cash prizes and awards. For future reference, all the information about designers, models, tailoring technicians and suits are stored in a database.

- For each costume-designer, the database must keep track of a unique designer ID number, and a name (which is composed of a first and a last name).
- For each Model, a unique model identifier, his name (which is composed of a first and a last name), and multiple phone numbers will be maintained.
- For each tailoring technician, the database must keep track of a unique tailor ID number, name and contact number.
- Each suit will have unique suit ID number, the suit's planned date of completion, fabric and its price.
- For each fashion show, the database must keep track of a unique show identifier, as well as the date and location of the show.
- Each designer designs many suits and each suit has only one designer.
- Each suit is designed to exactly for one model.
- Each tailoring technician must work on at least one suit, but can work on many. Each suit has at least one tailoring technician working on it, but can have many tailoring technicians working on it.
- The date when a tailoring technician started working on a particular suit will be tracked.

Invert the below ER diagram to its equivalent relational model diagram. The diagram should clearly indicate all the individual tables, fields and relationships indicated along with the key constraints. (8 Marks)



- a) Consider a university course registration system with entities for Students, Courses, and Enrolments. The relevant attributes are Student_ID, Name, Address, Phone_Number for Students; Course_Code, Course_Name, Credits for Courses; and Student_ID, Course_Code, Semester for Enrolments. Assume the following functional dependencies:

- $\text{Student_ID} \rightarrow \text{Name, Address, Phone_Number}$
- $\text{Course_Code} \rightarrow \text{Course_Name, Credits}$
- $\{\text{Student_ID}, \text{Course_Code}\} \rightarrow \text{Semester}$

- i. Identify the candidate keys and any two super keys for the given entity sets. (4 marks)
- ii. Calculate the closure for the following sets of attributes: $\{\text{Student_ID}\}$, $\{\text{Course_Code}\}$, $\{\text{Student_ID}, \text{Course_Code}\}$. (3 marks)
- iii. Derive the minimal cover for the functional dependencies provided. (3 marks)

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