	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Winter Examination – 2022** **Course: B. Tech. Branch : CSE Semester : V** **Subject Code & Name: BTCOC501** **Max Marks: 60 Date:28/01/2023 Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	Why would you choose a database system instead of simple storing data in file processing system? Compare file processing system and DBMS.	**L1,L2/CO 1**	**6**
B)	Define an Entity and Attribute. Explain the different types of attributes that occur in an ER diagram model, with an example.	**L2/CO1**	**6**
C)	Draw an E-R diagram of Banking system taking into account at least five entities, indicate all keys, constraints and assumptions that are made.	**L3/CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	Define and differentiate the following relational algebra operators with suitable example: (i) Cartesian product (ii) Natural join	**L1,L2/ CO2**	**6**
B)	Consider the following relational schema. Suppliers(sid, sname, address) Parts(pid, pname, address) Catalog(sid, pid, cost) (i) Write relational algebra query to find the names of suppliers who supply some red part (ii) Write relational algebra query to find the sid of suppliers who supply some red or green parts	**L3,L5/ CO2**	**6**
C)	Consider the following employee database. Give expression in tuple relational calculus for each of the following queries. employee(employee_name,street,city) works(employee_name,company_name,salary) company(company_name,city) manages(employee_name,manager_name) (i)Find the names of all employees who work for First Bank Corporation.	**L3,L5/ CO2**	**6**

	(ii)Find the names and cities of residence of all employees who work for First Bank Corporation (iii)Find all employees who live in the same city as that in which the company for which the work is located.		
Q. 3	**Solve Any Two of the following.**		**12**
A)	Consider the following schema and solve following queries using SQL. employee (emp_no, name, skill ,pay_rate) position (posting_no, skill) duty-allocation (posting_no, emp_no, day, shift) (i) Get duty allocation details for emp_no 123461 for the month of april 1986. (ii) Get employees whose rate of pay is more than or equal to the rate of pay of employee 'XYZ'. (iii) Get the names and pay rates of employees with emp_no less than 123460 whose rate of pay is more than the rate of payoff atleast one employee with emp_no greater than or equal to 123460.	**L3,L5/ CO2**	**6**
B)	Consider the following relational schema. Weather (city, temperature, humidity, condition) Location (city, country) Write the following queries in SQL: (i) Find all the tuples having temperature greater than that of Paris. (ii) Find the names of those cities with temperature and condition whose condition is neither Sunny nor Cloudy but temperature must be greater than 70. (iii) Find all the cities with temperature, condition and humidity, whose humidity is in the range of 63 to 79.	**L3,L5/ CO2**	**6**
C)	What is view? What are its advantages? Explain views in SQL with suitable example.	**L2/ CO2**	**6**
Q.4	**Solve Any Two of the following.**		**12**

A)	What is Normalization? Explain the importance of normalization.What is the criteria for good relation design?	**L2/ CO3**	**6**
B)	Explain BCNF with suitable example and distinguish between BCNF and 3NF. Is relation R(student_no, course_no,instr_no) with F = { {student_no, course_no} → instr_no, instr_no→ course_no} in BCNF and 3NF? Justify your answer.	**L2,L3,L4/ CO3**	**6**
C)	Consider the relation schema R=(A,B,C,G,H,I) and Set of functional dependencies: $A \rightarrow B$ $A \rightarrow C$ $CG \rightarrow H$ $CG \rightarrow I$ $B \rightarrow H$ Compute $(AG)^{+}$.Is it candidate key? Justify your answer.	**L3,L4/ CO3**	**6**
Q. 5	**Solve Any One of the following.**		**12**
A)	Explain ACID properties in detail	**L2/CO5**	**6**
B)	What are ordered indices? Explain with suitable example. Distinguish between dense index and sparse index.	**L2,L4/ CO4**	**6**
C)	Construct a B+-tree for the following set of key values: (2, 3, 5, 7, 11, 17, 19, 23, 29, 31) Assume that the tree is initially empty and values are added in ascending order. Construct B+-trees for four pointers that will fit in one node	**L3/ CO4**	**6**
	***** End *****		

The grid and the borders of the table will be hidden before final printing.