

ROLLNO. _____

ENROLLMENTNO. _____

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING, SCHOOL OF ENGINEERING SCIENCES
& TECHNOLOGY, JAMIA HAMDARD**

SEMESTER EXAMINATION 2022

BTCSE 502/BTCSEAI 502

DBMS

TIME:3 HRS MAXIMUM MARKS:75

Note: Do not write anything on paper except Roll No. & Enrollment No. Use of mobile phone is not allowed. Please follow proper numbering while answering the questions Proper steps are required to be specified for all questions

SECTION A

*All questions of Section A are compulsory (7*5)*

S.NO	QUESTIONS	MARKS	CO	BL
Q1.	Define DBMS. Explain the three tier architecture of DBMS.	5	CO2	L3
Q2.	For a relation R (A, B, C, D, E, F, G, H, I, J) the set of FDS are given as follows: FD: { $AB \rightarrow C$, $A \rightarrow DE$, $D \rightarrow IJ$, $B \rightarrow F$, $F \rightarrow GH$ }. Find the candidate key(s) of relation R and normalize up to BCNF.	5	CO3	L2
Q3.	What is functional dependency? Explain various Armstrong's Inference rule for Functional Dependencies.	5	CO2	L1
Q4.	Check whether the given schedule S is conflict serializable or not- S : $R_1(A)$, $R_2(A)$, $R_1(B)$, $R_2(B)$, $R_3(B)$, $W_1(A)$, $W_2(B)$	5	CO1	L4
Q5.	Explain ACID properties and different states of transactions with Diagram.	5	CO4	L5
Q6.	The Student table consists of Student_ID, Stu_Name, Stu_Subject_ID, Stu_Marks, and Stu_Age columns, and the Subject table consists of Subject_ID and Subject_Name columns. Write a query to create the table in Structured Query Language and insert the data into the table. Write a query to view the specific record of the table by using the WHERE clause. Write a query to find the minimum and maximum marks obtained.	5	CO5	L6
Q7.	State in brief the fundamental operations of relational algebra.	5	CO4	L3

SECTION B
Answer any 4 questions in Section B (4*10)

S.NO	QUESTIONS	MARKS	CO	BL
Q1.	Draw an E-R diagram for hospital system with a set of patients and medical doctors. Also find the minimum number of tables required to translate the E-R diagram having many to many relationship with entities E1 (<u>Name</u> , age, address) and E2 (<u>Student-Id</u> , marks)	10	CO3	L2.
Q2.	Relation R has eight attributes ABCDEFGH. Fields of R contain only atomic values. $F = \{CH \rightarrow G, A \rightarrow BC, B \rightarrow CFH, E \rightarrow A, F \rightarrow EG\}$ is a set of functional dependencies (FDs) that hold for R. How many candidate keys does the relation R have? Given a relation R(A, B, C, D) and Functional Dependency set $FD = \{AB \rightarrow CD, B \rightarrow C\}$, determine whether the given R is in 2NF? If not convert it into 2 NF.	10	CO3	L3
Q3.	T1 T2 T3 Read (X) Read (Y) Read (Y) Write (X) Write (F) Write (X) Read (X) Write (X) Write (X) Explain Serializability. Consider the following schedule for transactions T1, T2 and T3, Specify correct schedule for serialization. Check conditions for conflict serializability.	10	CO1	L1
Q4.	Insert 1, 3, 5, 7, 9, 2, 4, 6, 8, 10 in a B Tree. (Order=3) For same sequence given in build a B+ tree and then Remove 9, 7, 8.	10	CO4	L4
Q5.	Explain Joining of Relations. Discuss Left Outer, Right Outer & Full Outer Join taking suitable examples.	10	CO5	L5
Q6.	Write SQL and relational algebra queries for following table : EMP(empno , deptno, ename ,salary, Designation, joiningdate, DOB,city) i) Display names of employees whose experience is more than 10 years ii) Display age of employees iii) Display average salary of all employee iv) Display name of employee who earned highest salary	10	CO2	L6

BLOOMS TAXANOMY LEVELS (BL)

1-REMEMBERING, 2-UNDERSTANDING, 3-APPLYING, 4-ANALYSING,
5-EVALUATING, 6-CREATING