Roll No. _____

KIET Group of Institutions

PUE Examination (2022-2023) EVEN Semester

Department: MCA
Course: MCA
Year: 1st **Semester: II**
Subject Name: DATABASE MANAGEMENT SYSTEMS **Subject Code: KCA204**

Duration: 3 Hrs **Max. Marks: 100**
Note: Attempt all the questions of each section

<table>
<tr><th colspan="4">Section-A</th><th>(2×10=20)</th></tr>
<tr><th>Q. 1</th><th></th><th>Competitive Exam#</th><th>CO</th><th>BL/ KC*</th></tr>
<tr><td>a</td><td>What do you mean by logical data independence?</td><td></td><td>1</td><td>1/C</td></tr>
<tr><td>b</td><td>What is the symbol used to represent weak entity type?</td><td>GATE 2020</td><td>1</td><td>2/C</td></tr>
<tr><td>c</td><td>There is a table named EMP (ID, Name, DOJ). Write the sql query to display all the customer details. (Note – Date of joining must be displayed in the format ‘07/12/2019’)</td><td></td><td>2</td><td>3/C</td></tr>
<tr><td>d</td><td>How a stored procedure is different from trigger/</td><td></td><td>2</td><td>1/C</td></tr>
<tr><td>e</td><td>Define multivalued dependency. Give an example.</td><td></td><td>3</td><td>1/C</td></tr>
<tr><td>f</td><td>Given a relation R(ABCDEF) with the set of functional dependencies H = { A -> CE, B -> D, C -> ADE, BD - > F}, Is ADE a key for this relation?</td><td>GATE 2016</td><td>3</td><td>3/C</td></tr>
<tr><td>g</td><td>What do you mean by a serializable schedule?</td><td></td><td>4</td><td>1/C</td></tr>
<tr><td>h</td><td>Differentiate between immediate and deferred update strategy of database update.</td><td></td><td>4</td><td>2/C</td></tr>
<tr><td>i</td><td>There is a schedule S having 3 transactions. Compute the number of possible serial schedules.</td><td></td><td>5</td><td>3/C</td></tr>
<tr><td>j</td><td>What do you mean by the commit point of a transaction?</td><td></td><td>5</td><td>1/C</td></tr>
<tr><th colspan="4">Section-B</th><th>(6×5=30)</th></tr>
<tr><td rowspan="3">Q. 2</td><td colspan="3">Explain the following
a) Single Valued attribute & Multi Valued attribute
b) Stored attribute & Derived Attribute</td><td rowspan="3">1</td><td rowspan="3">2/C</td></tr>
<tr><td colspan="3">OR</td></tr>
<tr><td colspan="3">With a neat diagram explain the three layer architecture of DBMS.</td></tr>
<tr><td rowspan="4">Q. 3</td><td colspan="3">Write the SQL command to Create the table.

<table>
<tr><th>Column Name</th><th>Data Type</th><th>Size</th><th>Remark</th></tr>
<tr><td>Empid</td><td>Number</td><td>5</td><td>Primary Key</td></tr>
<tr><td>Name</td><td>Varchar2</td><td>25</td><td>Null values are not allowed</td></tr>
<tr><td>City</td><td>Varchar2</td><td>15</td><td>Must be either from Delhi, or Mumbai</td></tr>
<tr><td>Email</td><td>Varchar2</td><td>30</td><td>Must take unique values only</td></tr>
</table></td><td rowspan="4">2</td><td rowspan="4">3F/C</td></tr>
<tr><td colspan="3">OR</td></tr>
<tr><td colspan="3">There is a table named Publisher (PID, PName, Address), Write a trigger to store the old publisher record in a table named Pub_Backup(Pid, Pname, Address, Change_date), when any update to Address of the publisher.</td></tr>
<tr><td>Q. 4</td><td colspan="3">Define 3NF. There is a relation named Emp_Dept(SSN, Ename, Bdate, Address, Dnumber, Dname, Dmgrssn), with the set of functional dependencies as</td><td>3</td><td>3/C</td></tr>
</table>

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- **Bloom’s Level (BL) - Bloom’s taxonomy framework is planning and designing of assessment of student’s learning.**
- *Knowledge Categories (KCs): **F**-Factual, **C**-Conceptual, **P**-Procedural, **M**-Metacognitive
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	SSN -> Ename, Bdate, Address Dnumber -> Dname, Dmgrssn SSN is the key attribute for the relation In which normal form the relation is? Normalize it to the next higher normal form.			
	OR			
	Consider the following two sets of FDs: F={A -> C, AC->D, E->AD, E->H} and G={A ->CD, E->AH}. Check whether they are equivalent.	GATE 2017		
Q. 5	Discuss ACID properties of transaction.		4	2/C
	OR			
	Explain the check point mechanism used to recover from a transaction failure.			
Q. 6	Explain system log. What are the record entries done into the system log during execution of a transaction?		5	2/C
	OR			
	Describe Validation concurrency control protocol.			
Section-C				**(10×5=50)**
Q. 7	Consider the assumptions a) Employee works for a department b) In one department there are many employees c) Each employee have some dependents d) Employee works in some projects Considering the above assumptions draw an E-R Diagram. Convert the diagram to Relational Model.		1	3/C
	OR			
	A table named EMP(Empid, Name, DOB, Address, Passport_No, Lisence_No, SSN) is there. Find out the following: a) Alternative Keys b) Non-key Attributes c) Non-Prime attributes d) Prime Attribute			
Q. 8	Demonstrate inner-join and outer-join with suitable example.		2	3/C
	OR			
	There is a table named EMP(Id, Name, DOJ, Dept), Salary. Write the SQL query for the following a) Display the employees who are working either in MCA dept or in CS Dept. b) Display the employees according to date of joining. (Recent joins should come first) c) Display the number of employees working in MCA Department. d) Display the unique dates on which joining has been done. e) Display the employees who are getting more salary than what 'Rohan' is getting.			
Q. 9	What is partial functional dependency? Explain how insertion anamoly, updation anamoly and deletion anamoly occurs when a relation is having partial dependency?		3	2/C
	OR			
	Given a relation EMP_PROJ(SSN, Pnumber, Hours, Ename, Pname, Plocation) with FDs as SSn - > Ename, Pnumber -> Pname, Plocation, SSN, Pnumber - > Hours			

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	The relation is decomposed into R1(SSN, Ename), R2(Pnumber, Pname, Plocation), R3(SSN, Pnumber, Hours). Check the decomposition is a good decomposition or not?			
Q. 10	How serial schedule is different from non-serial schedule? Given two schedules as follows (a) Time T_1: read_item(X); $X := X - N$; write_item(X); read_item(Y); $Y := Y + N$; write_item(Y); T_2: read_item(X); $X := X + M$; write_item(X); Schedule A (b) Time T_1: read_item(X); $X := X - N$; write_item(X); read_item(Y); $Y := Y + N$; write_item(Y); T_2: read_item(X); $X := X + M$; write_item(X); Schedule B Examine whether schedule A is a conflict serializable schedule or not?		4	2/C
	OR			
	Write the reasons of the failure of a transaction. Discuss the log based recovery mechanism for failure of a transaction.			
Q. 11	Explain Timestamp based Locking protocol for achieving concurrent execution of transactions.		5	2/C
	OR			
	What do you mean by concurrency? Explain 2phase locking concurrency protocol along with its variations.			

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