Dr. A.P.J. Abdul Kalam Technical University (AKTU) · B.Tech Theory Examination

Database Management System

KCS501 · 2022

Time: 3 Hours **Max. Marks: 100**

1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1(a)	What is the significance of Physical Data Independence?	2	U1
1(b)	List the four functions of DBA.	2	U1
1(c)	When a relation set is called a recursive relationship set?	2	U1
1(d)	What do you mean by currency with respect to database?	2	U5
1(e)	What is Relational Calculus?	2	U2
1(f)	What is Equi-Join in database?	2	U2
1(g)	What is a CLAUSE in terms of SQL?	2	U2
1(h)	Define the closure of an attribute set.	2	U3
1(i)	When is a transaction Rolled Back?	2	U4
1(j)	List the various levels of locking?	2	U5

SECTION B

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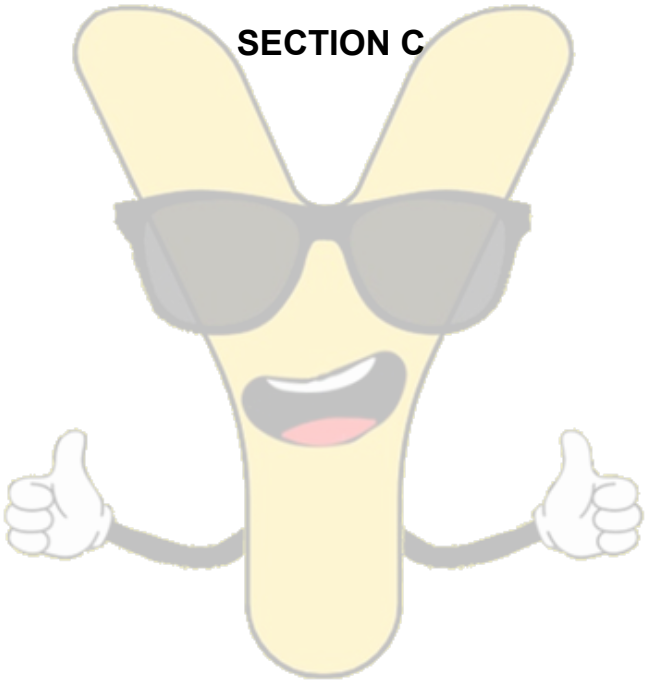
2(a)	Draw the overall structure of DBMS and explain its various components.	10	U1
2(b)	Which relational algebra operations require the participating tables to be union-compatible? Give the Reason in detail.	10	U2
2(c)	What do you understand by transitive dependencies? Explain with an example any two problems that can arise in the database if transitive dependencies are present in the database.	10	U3
2(d)	List ACID properties of transaction. Explain the usefulness of each. What is the importance of log?	10	U4
2(e)	What do you mean by time stamping protocol for concurrency controlling? Discuss multi version scheme of concurrency control.	10	U5

SECTION C



3	(a) What are the different types of Data Models in DBMS? Explain them. (b) State the procedural DML and nonprocedural DML with their differences.	10	U1
4	(a) Student (RollNo, Name, Father_Name, Branch) Book (ISBN, Title, Author, Publisher) Issue (RollNo, ISBN, Date-of –Issue) Write the following queries in SQL and relational algebra: I. List roll number and name of all students of the branch 'CSE'. II. Find the name of student who has issued a book published by 'ABC' publisher. III. List title of all books and their authors issued to a student 'RAM'. IV. List title of all books issued on or before December 1, 2020. V. List all books published by publisher 'ABC'. (b) What do you mean by trigger? Explain it by a suitable example.	10	U2
5	(a) Describe Armstrong's axioms in detail. What is the role of these rules in database development process? (b) Describe the term MVD in the context of DBMS by giving an example. Discuss 4NF and 5NF also.	10	U3
6	(a) Describe serializable schedule. Discuss conflict serializability with suitable example. (b) Discuss the procedure of deadlock detection and recovery in transaction?	10	U4
7	(a) Given a schedule S for transactions T1 and T2 with set of read and write operations, S: R1(X) R2(X) R2(Y) W2(Y) R1(Y) W1(X). Identify, whether given schedule is equivalent to serial schedule or not? (b) Discuss 2 phase commit (2PC) protocol and time stamp based protocol with suitable example. How the validation based protocols differ from 2PC?	10	U5

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