Q. Code:637456

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third Semester

IT18305– DATABASE SYSTEMS

(Information Technology)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Evaluate the basic concepts and various data model used in database design ER modelling concepts and architecture use and design queries using SQL	**5**
CO 2	Apply advanced queries execution using relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL	**3**
CO 3	Apply concurrency control and recovery mechanisms for practical problems	**3**
CO 4	Interpret internal storage structure based on the requirement	**3**
CO 5	Evaluate the types of database and use for real world applications	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Analyze the responsibilities of the DBA and the database designers?	**1**	**4**
2.	Differentiate super key and candidate key.	**1**	**2**
3.	Distinguish between single-valued and multi-valued attributes.	**2**	**3**
4.	What are the desirable properties of relational decomposition?	**2**	**2**
5.	List the ACID properties.	**3**	**2**
6.	Why is concurrency needed?	**3**	**3**
7.	How are ordered indices used?	**4**	**2**
8.	How is dynamic hashing different from static hashing?	**4**	**3**
9.	Compare centralized and distributed databases.	**5**	**4**

10.		How is data stored in multimedia databases?	**5**	**3**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)		Examine architecture of a database management system with a neat diagram.	**(14)**	**1**	**4**
		(OR)			
(b)	**(i)**	Analyze domain relational calculus with suitable example.	**(7)**	**1**	**4**
	(ii)	Create a trigger to update the total salary in the department relation when the salary of the employee is updated in the employee relation.	**(7)**	**1**	**4**
12. (a)	**(i)**	Draw an E-R diagram for the Hospital management. Document all assumptions that you make about the mapping constraints.	**(8)**	**2**	**3**
	(ii)	Use Armstrong's inference rules to discuss functional dependencies.	**(6)**	**2**	**3**
		(OR)			
(b)		Why normalization important? Illustrate 1NF, 2NF, 3NF with suitable examples.	**(14)**	**2**	**3**
13. (a)	**(i)**	Show with a neat sketch the different states of a transaction.	**(6)**	**3**	**3**
	(ii)	Examine the Wait/Die and wound/ wait Schemes in transaction management.	**(8)**	**3**	**3**
		(OR)			
(b)	**(i)**	Examine the working of two phase commit protocol in detail.	**(7)**	**3**	**3**
	(ii)	Illustrate the variants of two phase locking protocols with appropriate examples.	**(7)**	**3**	**3**
14. (a)		Elaboration the various levels of RAID with suitable diagrams.	**(14)**	**4**	**2**
		(OR)			
(b)		Explain the structure of B-tree nodes and show how data retrieval, insertion and deletion are done using B tree.	**(14)**	**4**	**2**
15. (a)		Analyze the features and architecture of MongoDB and compare it with relational databases.	**(14)**	**5**	**4**
		(OR)			
(b)		Asses the architecture, data storage and transaction processing of distributed databases.	**(14)**	**5**	**4**

PART- C (1 x 10 = 10 Marks)
(Q.No.16 is compulsory)

			Marks	CO	RBT LEVEL
16.		Consider the SAILOR Database	**(10)**	**1**	**5**

Sailors (sid:string, sname:string, rating:integer, age:real)
Boats (bid:integer, bname:string, color:string)
Reserves (sid:integer, bid:integer, day:date)
Based on the above schema, write the corresponding SQL queries for the following:
(i) Find the names of sailors less than 50 years.
(ii) Find the names of sailor with maximum rating.
(iii) Find the colors of boats reserved by sailor with ID:10.
(iv) Find the names of the sailors who have reserved both a Red boat and a Green boat.
(v) Find names of boats reserved in the month of February.

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