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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Third Semester – Regular) Examinations, December – 2020 BPPCS 3010/ BPCCT 3010 - DATA BASE MANAGEMENT SYSTEMS (CSE & CST)

Time: 2 hrs

Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)
(1 x 10 = 10 Marks)
Q.1. Answer ALL questions
[CO#] [PO#]

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| <p>a. In which condition the subset of a super key is a candidate key?</p> <p>(i) No proper subset is a super key (ii) All subsets are super keys</p> <p>(iii) Subset is a super key (iv) Each subset is a super key</p> | CO1 | PO1 |
| <p>b. The query in the tuple relational calculus is expressed as:</p> <p>(i) $\{t \mid P() \mid t\}$ (ii) $\{P(t) \mid t\}$</p> <p>(iii) $\{t \mid P(t)\}$ (iv) All of the mentioned</p> | CO2 | PO1 |
| <p>c. Fifth Normal form is concerned with</p> <p>(i) Functional dependency (ii) Multivalued dependency</p> <p>(iii) Join dependency (iv) Domain-key</p> | CO3 | PO1 |
| <p>d. Which level of RAID refers to disk mirroring with block striping?</p> <p>(i) RAID level 1 (ii) RAID level 2</p> <p>(iii) RAID level 0 (iv) RAID level 3</p> | CO3 | PO1 |
| <p>e. In a _____ clustering index, the index record contains the search-key value and a pointer to the first data record with that search-key value and the rest of the records will be in the sequential pointers.</p> <p>(i) Dense (ii) Sparse</p> <p>(iii) Straight (iv) Continuous</p> | CO4 | PO1 |
| <p>f. What are the different ways of dealing with deadlock?</p> <p>(i) Deadlock prevention (ii) Deadlock recovery</p> <p>(iii) Deadlock detection (iv) All of the mentioned</p> | CO4 | PO1 |
| <p>g. Which one of the following is a procedural language?</p> <p>(i) Domain relational calculus (ii) Relational algebra</p> <p>(iii) Tuple relational calculus (iv) Query language</p> | CO1 | PO1 |
| <p>h. Which of the following are introduced to reduce the overheads caused by the log-based recovery?</p> <p>(i) Checkpoints (ii) Indices</p> <p>(iii) Deadlocks (iv) Locks</p> | CO3 | PO1 |
| <p>i. A deadlock exists in the system if and only if the wait-for graph contains a _____</p> <p>(i) Cycle (ii) Direction</p> <p>(iii) Bi-direction (iv) Rotation</p> | CO2 | PO1 |
| <p>j. Consider a relation R(A,B,C,D,E) with the following functional dependencies:
ABC -> DE and
D -> AB
The number of Candidate Key of R is:</p> <p>(i)2 (ii)7</p> <p>(iii)10 (iv)12</p> | CO3 | PO2 |

PART – B: (Short Answer Questions)**(2 x 5 = 10 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. Differentiate between database management system and traditional file system.	CO1	PO1
b. Define Generalization and Aggregation with suitable example.	CO1	PO1
c. Differentiate between 3NF and BCNF.	CO3	PO1
d. Draw a neat Transaction State diagram.	CO3	PO1
e. What is a SAVEPOINT?	CO4	PO1

PART – C: (Long Answer Questions)**(6 x 5 = 30 Marks)**Answer ANY FIVE questions

	Marks	[CO#]	[PO#]
3. Explain the concept of Data independence.	(6)	CO1	PO1
4. Describe in detail about two-tier and three-tier client-server architectures.	(6)	CO1	PO1
5. Consider the following schemas:	(6)	CO2	PO2
Sailors (sid, sname, rating, age)			
Reserves (sid, bid, day)			
Boats (bid, bname, color)			
Write the following queries in relational algebra / tuple relational Calculus / domain relational calculus:			
a) Find the name of sailors who have reserved boat 103.			
b) Find the names and ages of sailors with a rating above 7.			
c) Find the names of sailors who have reserved a red boat.			
d) Find the sname, bid, and day for each reservation.			
e) Find the name of sailors who have reserved at least one boat.			
6. Draw an ER diagram for Hospital management system.	(6)	CO2	PO1
7. Compute canonical cover F_c for the $R = \{A, B, C, D\}$ and $FD's = \{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C, AC \rightarrow D\}$	(6)	CO3	PO2
8. Consider a relation schema $R(A, B, C, D, E)$ with a set of FDs	(6)	CO3	PO2
$F = \{A \rightarrow B, BC \rightarrow E, ED \rightarrow A\}$			
1 List all keys of R			
2 Is R in 3NF			
3 Is R in BCNF			
9. Distinguish between:	(6)	CO4	PO1
i) Primary and Secondary indexing.			
10. Draw transaction state diagram and describe each state that a transaction goes through during its execution.	(6)	CO4	PO1

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