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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Fifth Semester)

**BCSOE 5051 - DATABASE MANAGEMENT SYSTEMS**

(AEI &amp; ECE)

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#]

- a. A \_\_\_\_\_ integrity constraint requires that the values appearing in specified attributes of any tuple in the referencing relation also appear in specified attributes of at least one tuple in the referenced relation. CO2 PO1
- (i) Referential (ii) Referencing  
 (iii) Specific (iv) Primary
- b. The query in the tuple relational calculus is expressed as: CO2 PO1
- (i)  $\{t \mid P() \mid t\}$  (ii)  $\{P(t) \mid t\}$   
 (iii)  $\{t \mid P(t)\}$  (iv) All of the mentioned
- c. There are two functional dependencies with the same set of attributes on the left side of the arrow: CO3 PO2
- A->BC  
 A->B  
 This can be combined as
- (i) A->BC (ii) A->B  
 (iii) B->C (iv) None of the mentioned
- d. Which level of RAID refers to disk mirroring with block striping? CO3 PO1
- (i) RAID level 1 (ii) RAID level 2  
 (iii) RAID level 0 (iv) RAID level 3
- e. Which of the following has “all-or-none” property? CO4 PO1
- (i) Durability (ii) Isolation  
 (iii) Atomicity (iv) All of the mentioned
- f. What are the different ways of dealing with deadlock? CO4 PO1
- (i) Deadlock prevention (ii) Deadlock recovery  
 (iii) Deadlock detection (iv) All of the mentioned
- g. Which of the following is a fundamental operation in relational algebra? CO2 PO1
- (i) Set intersection (ii) Natural join  
 (iii) Assignment (iv) None of the mentioned
- h. Which of the following are introduced to reduce the overheads caused by the log-based recovery? CO3 PO1
- (i) Checkpoints (ii) Indices  
 (iii) Deadlocks (iv) Locks
- i. \_\_\_\_\_ rollback requires the system to maintain additional information about the state of all the running transactions. CO4 PO1

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|------------|--------------|--|--|
| (i) Total  | (ii) Partial |  |  |
| (iii) Time | (iv) Commit  |  |  |
- j. 1. Consider a relation R(A,B,C,D,E) with the following functional dependencies: CO3 PO2  
 ABC -> DE and  
 D -> AB  
 The number of Candidate Key of R is:
- |         |        |
|---------|--------|
| (i)2    | (ii)7  |
| (iii)10 | (iv)12 |

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

- Q.2. Answer ALL questions [CO#] [PO#]
- |  |     |     |
|--|-----|-----|
| a. Define database schema and database state.                | CO1 | PO1 |
| b. List and explain the properties of decomposition.         | CO2 | PO1 |
| c. What do you mean by Sparse indexing?                      | CO4 | PO1 |
| d. Briefly explain the term Transaction.                     | CO4 | PO1 |
| e. Differentiate between Primary and Secondary storage space | CO3 | PO1 |

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

- Answer ANY FIVE questions Marks [CO#] [PO#]
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|--|-----|-----|-----|
| 3. Explain in detail about Database Management System and the advantages over file management system.  | (6) | CO1 | PO1 |
| 4. Explain the following: i) Key constraints ii) Integrity constraints.  | (6) | CO2 | PO1 |
| 5. Draw an ER diagram for Hospital management system.  | (6) | CO2 | PO1 |
| 6. Define BCNF. How does BCNF differ from 3NF? Explain with example.   | (6) | CO2 | PO1 |
| 7. Consider a relation schema R(A, B, C, D, E) with a set of FDs<br>$F = \{A \rightarrow B, BC \rightarrow E, ED \rightarrow A\}$<br>1 List all keys of R<br>2 Is R in 3NF<br>3 Is R in BCNF | (6) | CO3 | PO2 |
| 8. Explain, classification of storage structure  | (6) | CO4 | PO1 |
| 9. Draw transaction state diagram and describe each state that a transaction goes through during its execution.  | (6) | CO4 | PO1 |
| 10. Explain the time stamp based protocol for concurrency control in a DBMS.   | (6) | CO4 | PO1 |

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