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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (C.S.E.) III Year I-Semester (Main) Examinations, Nov./Dec.-2016**

**Database Management Systems**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

- What are three levels of Data abstraction?
- What does the cardinality ratio specify?
- Write an expression in SQL that is equivalent to each of the following queries:  
 i)  $r_1 - r_2$       ii)  $\pi_{AB}(r_1) \bowtie \pi_{AB}(r_2)$   
 where  $R=(A,B,C)$  and let  $r_1$  and  $r_2$  both be relations in schema  $R$ .
- What is View? How it is defined?
- Define Dynamic SQL.
- What is the importance of Normalization?
- Construct a B + tree for the following set of key values  
 10 20 30 40 50 60.
- What is a transaction? What are ACID properties?
- Define the phases of two phase locking protocol.
- What is a checkpoint and when does it occur?

**Part-B (5 × 10 = 50 Marks)**

- Explain the architecture of DBMS with a neat block diagram. [6]
  - Construct an E R diagram for a hospital with a set of patients and a set of medical doctors. [4]  
 Associated with each patient a log of the various tests and examinations conducted.
- Explain the fundamental Relational algebra operations with examples. [4]
  - Consider the following relational Schema and write the queries in SQL. [6]  
 Employee (E\_name, Street, City)  
 Works\_For(E\_name, Company\_Name, Salary)
    - Find city and name of employee who are working.
    - Find name of employees who are not working.
    - Name of employees who are working for TCS.
- Define Normalization and Explain 1NF, 2NF and 3NF with examples. [5]
  - Write a PL/SQL Trigger program to insert an employee record only on Monday. [5]
- Describe the concept of serializability with suitable example. [5]
  - Show the extendable hash structure for the file which contain records with the following search key values: 2 3 5 7 11 17 19 23 29 31 [5]  
 where hash function is  $h(x) = x \text{ mod } 8$  and bucket size is 3.
- Explain Two phase Locking technique for Concurrency Control. [5]
  - Describe log based recovery in detail. [5]
- Describe the functionalities of a database Administrator. [5]
  - Explain the concept of Generalization and Specialization. [5]
- Write short notes on any *two* of the following:
  - ODBC [5]
  - Cascade less schedules [5]
  - Deadlocks [5]