

**B.E. INFORMATION TECHNOLOGY SUPPLEMENTARY EXAM 2018****SECOND YEAR, FIRST SEMESTER****DATABASE MANAGEMENT SYSTEMS**

Time: 3 Hours

Marks: 100

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 Note : Answer any five questions.
 

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1. (a) What is the advantage of DBMS over file processing system? What is weak entity set? How will you implement it in a relational database?
- (b) What is referential Integrity?
- (c) A software company handles number of projects. Each project is managed by a Manager. A manager may be in charge of multiple projects. Software engineers work for a project. An engineer may be involved with multiple projects. Manager evaluates each engineer working in the project and sends performance report. Customer sends a report and it is also to be stored. Bill is generated to charge the customer for the project. Expenses for the project are also to be stored. We must also be able to support queries on project information, its manager information, bill and expense information, Engineers involved in a project and their performance. Draw an ER Diagram for the system.
- (3+2+3+2+10)
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2. (a) Explain the process of normalization. What is the difference between Third Normal Form and BCNF?
- (b) Consider the following database relation:  
**R (A, B, C, D, E, F, G, H, I)**  
 with following functional dependencies { A -> C, AB-> EF, B->DGHI}  
 Find the normal form in which the relation R will be fully normalized.
- (c) What is a candidate key? Is there any difference between a Primary key and a candidate key?
- (3+3+6+4)
3. (a) Explain the various states of a transaction.
- (b) What is a Concurrent schedule? What do we mean by Conflict serializability? In a concurrent schedule, what is non conflicting swap?
- (c) Discuss a time stamp based protocol which can avoid cascading rollback. Also explain, whether it gives rise to deadlock or not
- (4+2+2+2+4+2)
4. (a) Write down the Read Lock and Write Unlock operation on item A.
- (b) Discuss two-phase locking protocol with one example.
- (c) What benefit does rigorous two-phase locking provided?
- (d) Give the wait-die and wound-wait protocol.
- (4+4+2+6)

5. (a) What kind of data redundancies can exist in a table? What are the problems associated with redundancies within a table? What is the solution to this problem?

(b) Give the possible Query trees corresponding to the given query:

Find the customer who has bought more than one mobiles from the store.

The available tables are

Mobile (model\_ID, Name, CompanyBrand, Price)

Customer (Cust\_ID, Name, Address, DoB)

Sold ( Cust\_ID, Model\_ID)

(4+3+3+6)

6. (a) What do you mean by Log-based recovery? What is cascading rollback?

(b) Describe the shadow paging recovery technique. How it is different from Log based recovery technique?

(c) Explain the purpose of the check point mechanism. How often should checkpoints be performed?

(3+3+5+3+4+2)