

Code No: 54013

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

- 1.a) What is DBMS? What are the applications of Database system?  
b) What are database languages? Explain with examples. [8+7]
- 2.a) Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the scores in each match, the players in each match and individual player statistics for each match. Summary statistics should be modeled as derived attributes.  
b) Briefly explain the additional features of ER model. [8+7]
- 3.a) Explain the following: i) Foreign key constraints ii) Querying relational data  
b) Let  $R = (A, B, C)$ , and let  $r_1$  and  $r_2$  both be relations on schema  $R$ . Give an expression in the domain relational calculus that is equivalent to each of the following:  
i)  $\pi_A(r_1)$                       ii)  $\sigma_{B=17}(r_1)$                       iii)  $r_1 \cup r_2$   
iv)  $r_1 \cap r_2$                       v)  $r_1 - r_2$                       vi)  $\Pi_{A,B}(r_1) \bowtie \Pi_{B,C}(r_2)$ . [7+8]
4. Explain the following:  
a) Nested queries  
b) Null values. [8+7]
- 5.a) Suppose that we decompose the schema  $R = (A, B, C, D, E)$  into  $(A,B,C)$  and  $(A,D,E)$ . Show that this decomposition is lossless-join decomposition, if the following set  $F$  of functional dependencies holds:  
 $A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A$ .  
b) Discuss about decomposition in detail. [8+7]
- 6.a) Explain the implementation of locking.  
b) Explain the implementation of atomicity and durability.  
c) Discuss about conflict serializability. [5+5+5]
- 7.a) Discuss in detail about ARIES recovery method.  
b) Explain transaction rollback. [12+3]
8. Construct a  $B^+$ -tree for the following set of key values.  
(2,3,5,7,11,17,19,23,29,31)  
Assume that the tree is initially empty and values are added in ascending order.  
Construct  $B^+$ -tree for the cases where the number of pointers that will fit in one node is as follows.  
a) four  
b) six  
c) eight. [15]