

**B.Tech. – VIEP – COMPUTER SCIENCE AND
ENGINEERING (BTCSVI)**

Term-End Examination

00484 June, 2017

BICS-011 : DATABASE MANAGEMENT SYSTEM

Time : 3 hours

Maximum Marks : 70

Note : Attempt any **seven** questions. All questions carry equal marks.

1. (a) Draw ANSI/SPARC 3 level architecture for database management system. List the SQL commands and languages involved at each level of the architecture. 5
- (b) Write short notes on any **two** of the following : 5
 - (i) Logical Data Independence
 - (ii) Physical Data Independence
 - (iii) File-based System
2. (a) Draw an ER diagram for the situation given below :
"Trainer trains trainees in an institution funded by an NGO. The institution offers training on various platforms, viz., MATLAB, SPSS, SAS, .NET, Java, etc."
Use appropriate notations, while drawing the diagram. 5

- (b) Transform the ER diagram developed in Q. 2(a) into a database (identify proper attributes associated with each entity). Synchronize the ER diagram with the database developed. 5
3. (a) Differentiate between the following : 5
- (i) Single level indexing and Multilevel indexing
 - (ii) Weak entities and Strong entities
- (b) Explain the process of dynamic multilevel indexing using B-trees and B+ trees. 5
4. (a) Given the relational schema :
- Supplier (S_code, S_name, S_status, S_city)
Parts (P_code, P_name, P_colour, P_weight)
Supply (S_code, P_code, Quantity)
- Write the relational algebra for the following queries : 5
- (i) Find the part codes (P_code) of the parts which are not supplied by any supplier.
 - (ii) Find the part names (P_names) of all the parts that are supplied by the suppliers in "Delhi".
- (b) Write the SQL equivalent of the queries asked in Q. 4(a). 5

5. (a) Explain the anomalies which occur when the relation is not in 3NF. Give suitable example in support of your explanation. 5
- (b) "Any relation in BCNF is in 3NF, but the converse is not true." Do you agree with the statement. Give suitable arguments in support of your answer. 5
6. (a) Discuss the concept of lossless decomposition with the help of a suitable example. 5
- (b) If $R(A, B, C, D, E, F, G)$ is a relation with functional dependency set
 $F = \{A \rightarrow F, B \rightarrow CD, C \rightarrow G, F \rightarrow E\}$,
then find the candidate key for the relation R. 5
7. (a) Write short notes on any **two** of the following : 5
- (i) Log Based Recovery
- (ii) Shadow Paging
- (iii) Enhanced ER Model
- (b) What do you understand by the term "Transaction" in DBMS ? Discuss the ACID properties of a database transaction in brief. 5

8. (a) Discuss the term database recovery. Explain any one technique of database recovery with suitable example. 5
- (b) Discuss the term Concurrency Control in DBMS. Explain any one technique of concurrency control with suitable example. 5
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