Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/BT/OLD/SEM-4/CS-415/2013

2013

DATABASE MANAGEMENT SYSTEM AND COMPUTER NETWORK

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

   i) An attribute of one table matching the primary key of another table is called
      a) Foreign key b) Secondary key
      c) Super key d) Composite key.

   ii) The ..... model defines the stored data structures in terms of database model used.
      a) physical schema b) conceptual schema
      c) both (a) and (b) d) none of these.

   iii) The decoupling of external level and the conceptual level is callled
      a) Logical data independence
      b) Local data independence
      c) Physical data indepedence
      d) none of these.

iv) Who is called the father of the relational database system ?

a) E.F. Codd b) Donald Chamberlin

c) C.J. Date d) H.F. Korth.

v) CODASYL stands for

a) complete open data and system language

b) conference on data systems language

c) conference on digital and analog systems in london

d) none of these.

vi) Which are the additional concept that were added in the EER model ?

a) Specialization b) Generalization

c) Categorization d) All of these.

vii) How many layers are used in OSI model ?

a) 7 b) 5

c) 9 d) 8.

viii) Communication takes place in both directions but one at a time

a) full duplex b) half duplex

c) simplex d) none of these.

ix) TCP/IP stands for

a) transfer control packet/internet protocol

b) transfer control protocol/internet protocol

c) transmission control protocol/internetworking protocol

d) none of these.

x) Signal and period are the ..... to each other.

a) direct b) inverse

c) additive d) none of these.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Define DBMS. Explain the system structure of DBMS.
3. Explain at least five relational operators in DBMS.
4. Design a library management system for your departmental library.
5. Explain simplex and half duplex communication.
6. a) Calculate the period of 60 Hz frequency.
   b) The period of a signal is 100 ms. Calculate the frequency in kilohertz.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Draw an E-R diagram for an engineering college using at least five entity sets. Also mention the assumptions you assumed. 5 + 2
   b) Draw and explain database system structure. 7
   c) What is DML ? 1
8. a) Consider the supplies-parts-projects database mentioned below :

   S(S#,SNAME,STATUS,CITY,primary key)

   P(P#,PNAME,COLOR,WEIGHT,CITY,Primary key P#)

   J(J#,JNAME,CITY,primary key J#)

   SPJ(S#,P#,J#,QUANTITY,primary key (S#,P#,J#), foreign key S# references S, foreign key P# references, P, foreign key J# references J)

   Write SQL statements to answer the following queries :

   i) Get full details of all projects in London.

ii) Get full details of parts supplied by a supplier in London.

iii) Get part numbers for parts supplied to a project by a supplier in the same city as the project.

iv) Get part numbers of parts supplied to some project in an average quantity of more than 350.

v) Get project numbers for projects not supplied with any red part by any London supplier. 5 × 2

b) What is the two-phase locking protocol ? How does it guarantee serializability ? 5

9. a) Explain "Concurrency Control" with suitable example. 6

b) How many topologies are there in case of LAN structure ? Explain any one with diagam. 6

c) "Candidate key is derived from super key". Justify. 3

10. a) What are the advantages of using DBMS over file processing systems ? 5

b) What are the advantages of distributed database over centralized database ? 5

c) What is "dirty read problem" ? Explain with suitable example. 5

11. Write short notes on any *three* of the following : 3 × 5

a) Transport Layer

b) ACID properties

c) LAN/MAN/WAN

d) DML

e) Different types of "transparency" in Distributed Database System.