2012

INTRODUCTION TO DBMS, COMPUTER NETWORK & NUMERICAL ANALYSIS

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 answers for any *ten* of the following :

$10 \times 1 = 10$

i) The topology with highest reliability is

a) Bus topology b) Star topology

c) Ring topology d) Mesh topology.

ii) TOP stands for

a) Transmission Control Protocol

b) Top Control Protocol

c) Timing Control Protocol

d) None of these.

iii) Which of the following is a database constraint ?

a) Unique b) Foreign key

c) Primary key d) All of these.

iv) Every determinant should be a candidate key is the definition for

a) 2NF b) 1NF

c) BCNF d) 3NF.

v) A relation is in BCNF always guarantees

a) Lossless join

b) Dependency preservation

c) Both (a) and (b)

d) None of these.

vi) The statement requesting the retrieval of information is usually in the form of

a) Report b) Query

c) Data entry screen d) Record.

vii) A variable in programming language corresponds to the following in Entity-Relation model

a) Instance b) Record

c) Entity d) Key.

viii) Which of the following give more accurate results for definite integration ?

a) Trapezoidal rule b) Simpson's 1/3 rd rule

c) Both (a) and (b) d) None of these.

ix) The advantages of Runge-Kutta method is

a) calculation is easy

b) that it requires only the functional values

c) all of these

d) none of these.

x) Newton forward interpolation is used when x lies

a) in the beginning of the table

b) in the middle of the table

c) in the bottom of the table

d) slightly outside the table.

xi) The value which is unavailable is represented in DBMS as

a) A blank space b) Zero

c) NULL d) 0.0001.

xii) In a time-domain plot, the vertical axis is a measure of

a) Amplitude b) Frequency

c) Phase d) Time.

GROUP – B

(Short Answer Type Questions)

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

2. What is called DBMS ? What is the difference between DBMS and RDBMS ? 2 + 3

3. Explain ER model in database management system ?

4. Describe the three-tier architecture.

5. Evaluate $\int_1^3 \frac{xdx}{x\text{^}2+3}$ by Simpson's 1/3 rule, taking 6 equal subintervals.

6. Find a root of the given equation lies between 1 & 2 :

$x^x + 2x - 6 = 0$

GROUP – C

(Long Answer Type Questions)

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

7. What is the reason for transmission impairment ? Discuss about three types of transmission impairment. What is LAN ?

2 + 9 + 4

8. a) Define Transaction. Explain ACID properties of transaction.

b) Explain different Transaction States.

c) Discuss different errors for transaction failure. 6 + 5 + 4

9. a) What is the difference between Database and Database Management System ?

b) Explain different types of Database Users.

c) Define DBA ? What are the functions of DBA ?

d) Explain two-tire and three-tire architectures for

database application. 3 + 2 + 4 + 6

10. Write the differences between the following : 5 + 5 + 5

a) Twisted-pair cable and coaxial cable.

b) Sky propagation and Line-of-sight propagation.

c) Omnidirectional waves and unidirectional waves.

11. a) Compute f' (1.1) and f'' (1.1) using Newton's formula

from the following table :

x :	1.1	1.2	1.3	1.4	1.5
$f(x)$:	2.0091	2.0333	2.0692	2.1143	2.1667

b) If $f(x) = 4\cos x - 6x$, find the relation $(e^x - \sin x) f(x)$

for $x = 0$ if the error in x is 0.005. 9 + 6

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