Seat No.

M.Sc. – I (Semester – I) Examination, 2015
COMPUTER SCIENCE (New)
Object Oriented Programming Using C++ (Paper – I)

Day and Date : Wednesday, 15-4-2015　　　　　　　　　　　Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
　　　　　　　　2) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives : 　　　　　　　　　　　　　　　　**10**

   1) Which of the following header file includes definition of cin and cout ?

      A) istream.h 　　　　　　　　　B) ostream.h

      C) iomanip.h 　　　　　　　　　D) iostream.h

   2) Which of the following provides a reuse mechanism ?

      A) Abstraction 　　　　　　　　B) Inheritance

      C) Dynamic binding 　　　　　　D) Encapsulation

   3) A constructor that accepts _____ parameters is called the default constructor.

      A) one 　　　　　　　　　　　　B) two

      C) three 　　　　　　　　　　　D) no

   4) Destructor has the same name as the constructor and it is preceded by _____

      A) ~ 　　　　　　　　　　　　　B) |

      C) ? 　　　　　　　　　　　　　D) $

   5) Array indexing always starts with the number

      A) 1 　　　　　　　　　　　　　B) 0

      C) 2 　　　　　　　　　　　　　D) –1

6) Setprecision requires the header file _____

   A) stdlib.h   B) iomanip.h

   C) console.h   D) conio.h

7) Which of the following is user defined data type ?

   A) Public   B) Private

   C) Class   D) Both A) and B)

8) The static member variable is initialized to _____

   A) 0   B) 1

   C) 2   D) 3

9) The mechanism that binds code and data together and keeps them secure from outside world is known as _____

   A) Abstraction   B) Encapsulation

   C) Inheritance   D) Polymorphism

10) What does your class can hold ?

   A) data   B) function

   C) both A) and B)   D) None of these

B) State whether following statements are **True** or **False** :   **4**

   1) An inline function is a function that is expanded in line when it is invoked.

   2) We can not have virtual constructors, but we can have virtual destructors.

   3) In operator overloading, we can change the basic meaning of an operator.

   4) A destructor is used to destroy the object that have been created by constructor.

2. A) Write a short note on following :   **8**

   i) Function overloading

   ii) Inline function.

B) Answer the following :   **6**

  i) Define Flowchart. Explain different symbols used in flowchart.

  ii) Explain primary data types used in C++.

3. Answer the following :

A) What is manipulator ? Explain the use of width(), precision and fill()
   manipulators.   **7**

B) What is Arrays of objects ? Explain with example.   **7**

4. Answer the following :

A) Write a program in C++ to study parameterized constructor.   **7**

B) What is Template ? Explain class template.   **7**

5. Answer the following :

A) Write a C++ program to implement single inheritance in which take 'STUDENT'
   as base class and derive the class named 'MARKS'. (Assume your own
   data/variables).   **7**

B) What do you mean by operator overloading ? Explain with suitable example.   **7**

6. Answer the following :

A) What is virtual function ? Explain characteristics of virtual functions.   **7**

B) Explain various concepts of Object Oriented Programming.   **7**

7. Answer the following :

A) Define a File. Explain I/O commands in file handling.   **7**

B) Explain call by reference and return by reference with example.   **7**

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Seat No.

M.Sc. – I (Semester – I) (Computer Science) Examination, 2015
NUMERICAL ANALYSIS (New) (Paper – II)

Day and Date : Friday, 17-4-2015   Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Q. No. **1** and Q. No. **2** are **compulsory.**
2) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.
4) **Use** of calculator is **allowed**.

1. A) **True** of **false** (**one** mark **each**) :

   i) Bisection method is used to find the complex root of the equation f(x) = 0.

   ii) $\Delta = E + 1$.

   iii) Lagrange's method is sued to find the interpolating polynomial.

   iv) Euler's method is accurate than Euler's modified method.

   B) Choose correct alternative (**one** marks **each**) :

   i) Which of the following is best approximation of $\dfrac{1}{3}$?

   a) 0.30   b) 0.33
   c) 0.34   d) 0.003

   ii) Error in Simpson's $\dfrac{1}{3}$ rd rule is given by E = _____

   a) $-\dfrac{1}{180} nh^5 y^{iv} (\xi)$ b) $\dfrac{1}{180} nh^5 y^{iv} (\xi)$

   c) $-\dfrac{1}{180} h^5 y^{iv} (\xi)$ d) $\dfrac{1}{180} h^5 y^{iv} (\xi)$

   iii) Rate of convergence of Newton Raphson method is _____
   a) 1st order   b) 2nd order
   c) 3rd order   d) 4th order

P.T.O.

iv) Power method is used to find _____

    a) eigen value and corresponding eigen vector

    b) eigen value only

    c) largest eigen value and corresponding eigen vector

    d) none

v) If $f(0) = 1$, $f(1) = 3$, $f(3) = 55$ then the lagranges fundamental polynomial $l_0(x) = $ _____

    a) $\dfrac{1}{3}(x^2 - 4x + 3)$ b) $(x^2 - 4x + 3)$

    c) $\dfrac{1}{32}(x^2 - 4x + 3)$ d) $\dfrac{1}{3}(x^3 - 4x + 3)$

C) Define the following (**one** marks **each**) :

  i) Central difference operator

  ii) Shift Operator

  iii) Averaging operator

  iv) Newton's divided difference interpolation formula

  v) Newton cotes general integration formula.

2. i) Define absolute, relative and percentage error.   **3**

  ii) Find the missing term :

0	1	2	3	4
5	10	20	--	80

      3

  iii) Prove the :

    a) $\mu\delta = \dfrac{1}{2}[\Delta + \nabla]$

    b) $\delta^2 = \Delta - \nabla$.   **4**

  iv) Construct the divided difference table for following data :

x	3	4	5	6	7
y=f(x)	13	21	31	43	57

      4

3. i) Find a real root of the equation $x^3 - 4x - 9 = 0$ by using bisection method. **8**

   ii) Use Gauss elimination method to solve

   $2x + y + z = 10$

   $3x + 2y + 3z = 18$

   $x + 4y + 9z = 16$ **6**

4. i) Derive rate of convergence of secant method. **7**

   ii) Find y(2) from the following data using Lagrange's formula.

x	1	3	4	5
y	1	81	256	625

   7

5. i) Reduce the matrix $A = -\begin{bmatrix} 1 & 3 & 4 \\ 3 & 1 & 2 \\ 4 & 2 & 1 \end{bmatrix}$ to the tridiagonal form using Householder's

   method. **8**

   ii) Evaluate $\int_{4}^{5.2} lnx\, dx$ by Simpson's 1/3rd rule by dividing the given interval

   into 6 parts. **6**

6. i) Find the largest eigen value and corresponding eigne vector of the matrix

   $A = \begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$. **8**

   ii) Explain Newton Raphson method. **6**

7. i) Derive Newton's forward difference interpolation formula. **7**

   ii) Given $\dfrac{dy}{dx} = 1 + xy, y(0) = 1$ obtain the Taylor's series for y(x) and compute

   y(0.1) correct to four decimal places. **7**

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Seat No.	

M.Sc. (Computer Science) (Part – I) (Semester – I) Examination, 2015
Paper – III : SOFTWARE ENGINEERING (New)

Day and Date : Monday, 20-4-2015　　　　　　　　　　　　　Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
　　　　　　　　2) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternative :　　　　　　　　　　　　　　　　**10**

　　1) Which one is not a category of software metrics ?
　　　　a) Product metrics　　　　　　　b) Process metrics
　　　　c) Project metrics　　　　　　　d) People metrics

　　2) Testing the software is basically
　　　　a) Verification　　　　　　　　b) Validation
　　　　c) Verification and validation　　d) None of the above

　　3) In object oriented software design inheritance is a kind of
　　　　a) relationship　　　　　　　　b) module
　　　　c) testing　　　　　　　　　　d) optimization

　　4) Which of the following is not a part of data flow diagram ?
　　　　a) Disk storage
　　　　b) Arrow
　　　　c) Data store
　　　　d) Process represented by bubble circle

　　5) Problem analysis is done during
　　　　a) System design phase　　　　b) System analysis phase
　　　　c) Before system test　　　　　d) All of these

6) Design phase is followed by

   a) Coding   b) Debugging

   c) Testing   d) Maintenance

7) A system design aid should primarily.

   a) Help analyze both data and activities

   b) Use graphical user interface

   c) Generate code

   d) Help in documentation

8) _____ is a black box testing method.

   a) Boundary value analysis   b) Basic path testing

   c) Code validation analysis   d) None of the above

9) Structured programming codes include

   a) Sequencing   b) Alteration

   c) Iteration   d) All of the above

10) Which of the following is not one of the software engineering layers ?

   a) Process   b) Tools

   c) Methods   d) Manufacturing

B) State **true** or **false** :   **4**

1) ERD stands for entity relationship design.

2) System development can cease after prototyping.

3) Most software development projects are initiated to meet business need.

4) Design pattern are not applicable to the design of object oriented software.

2. A) Write short note on following :   **8**

1) Transaction mapping.

2) Software engineering design process.

B) Answer the following :   **6**

1) Explain testing fundamental in brief.

2) Explain software product and process.

3. Answer the following :

   A) Explain rapid application development model in detail. **7**

   B) Explain why there is a need for requirement analysis. **7**

4. Answer the following :

   A) Explain various components used in requirement analysis. **7**

   B) Why prototyping is used for requirement analysis ? Explain with suitable example. **7**

5. Answer the following :

   A) Explain the basic issues in software testing. **7**

   B) Explain the various test case design. **7**

6. Answer the following :

   A) Explain basic path testing and control structured testing in detail. **7**

   B) Explain the various elements of an object oriented model. **7**

7. Answer the following :

   A) Explain interface design and procedural design in detail. **7**

   B) Explain the various strategies used for software design. **7**

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Seat No.

M.Sc. (Computer Science) (Part – I) (Semester – I) Examination, 2015
DATA STRUCTURES (New) (Paper – IV)

Day and Date : Wednesday, 22-4-2015   Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : *I) Q. **1** and Q. **2** are **compulsory** questions.*
                *II) Attempt **any three** questions from Q. **3** to Q. **7**.*
                *III) Figures to **right** indicate **full** marks.*

1. A) Choose the correct alternative :   **10**

    1) A _____ determines the set of values to which a constant belongs, or which may be assumed by a variable or an expression.
       a) Sentence case   b) Tree
       c) Data type   d) Software

    2) A Priority queue may lead to a problem of _____ ; that is nothing but the indefinite blocking state of elements in the queue.
       a) Fragmentation   b) Compaction
       c) Data Hiding   d) Starvation

    3) If non-zero elements are less in count, then such matrix is called _____
       a) 4-Dimensional Matrix   b) 1-Dimensional Matrix
       c) 2-Dimensional Matrix   d) Sparse Matrix

    4) A _____ cells, uses pointers to link successive list elements.
       a) Matrix   b) Stack
       c) Singly Linked   d) Tree

    5) The key for a given object can be calculated using a function called a _____
       a) Skolem Function   b) Nested Function
       c) Hash Function   d) Do While Loop

    6) _____ are used to organize information in database systems and to represent the syntactic structure of source programs in compilers.
       a) Queue   b) Collision
       c) Search   d) Tree

7) A _____ selects that option which is "locally optimal" in some particular sense.
   a) Preorder Traversal Algorithm
   b) Greedy Algorithms
   c) Depth First Search Algorithm
   d) None of these

8) A _____ is a linear data structure which can be accessed only at one of its ends for storing and retrieving data.
   a) Queue   b) Abstract Data Type
   c) Pipe   d) Stack

9) If a binary tree of arithmetic expression needs to be traversed and result is in the form of operator followed by the operand, then it's a _____ traversing.
   a) Post-order   b) Pre-order
   c) Ascending   d) Descending

10) A step by step procedure to solve a problem is called as _____
   a) Data Structure   b) Problem Solver
   c) Algorithm   d) Procedural Language

B) **True** or **False** :   **4**
   1) Merge Sort is a good example of backtracking algorithm.
   2) The filling-in of a table of sub-problems to get a solution to a given problem has been termed branch and bound.
   3) The approach is called breadth-first because from each vertex v that user visit as user searches as broadly as possible by next visiting all the vertices adjacent to v .
   4) An array variable whose components are again arrays is called a matrix.

2. A) Write a short note :   **8**
   1) Data structure.
   2) Circular Queue.

   B) Answer the following :   **6**
   1) What do you mean by Primitive Data Type ?
   2) Define the term Backtracking.

3. Answer the following :

   A) Define term Doubly Linked List. State and explain in detail the various operations on Doubly Linked with suitable example.   **7**

   B) Discuss in detail how to satisfy the constraint to solve Tower of Hanoi problem having three disks and three pegs ?   **7**

(a) Initial State   (b) Goal State
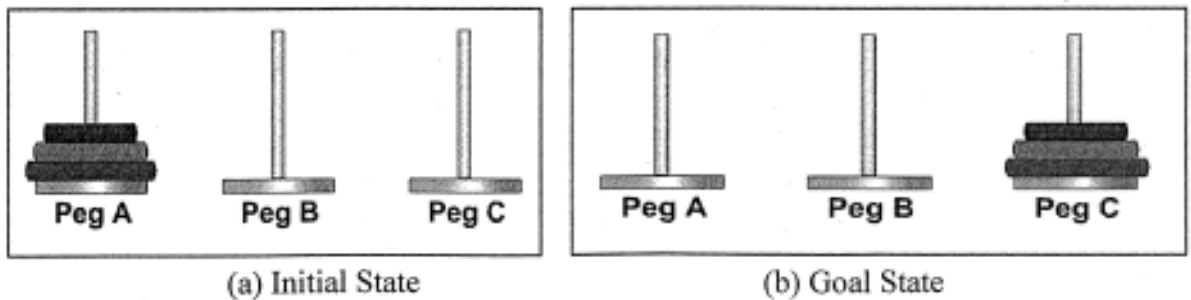
4. Answer the following :

   A) Define the term Queue. Explain in detail insertion and deletion at Dequeue with suitable example.   **7**

   B) What do you mean by Binary Tree ? Construct a Binary tree from given series and show the results of Pre-order, In-order and Post-order traversing at constructed Binary tree.   **7**

   Series : 39, 5, 43, 83, 66, 10, 8, 91, 26, 55, 3, 72, 100, 12, 60.

5. Answer the following :

   A) Define the term sorting. Perform Insertion Sort and show the result in passes on following series :

   Series : 56, 19, 200, 3, 10, 8, 193, 57, 33, 6, 51, 83, 28, 90, 319.   **7**

   B) Define Array. Discuss representations and applications of single and multidimensional array with suitable example.   **7**

6. Answer the following :

A) Discuss Breadth and Depth First search as a classical tree traversing algorithm with suitable example. **7**

B) State the Dijkstra's algorithm. Discuss how it will be useful for visiting all nodes shown in graph while visiting each node only once. **7**
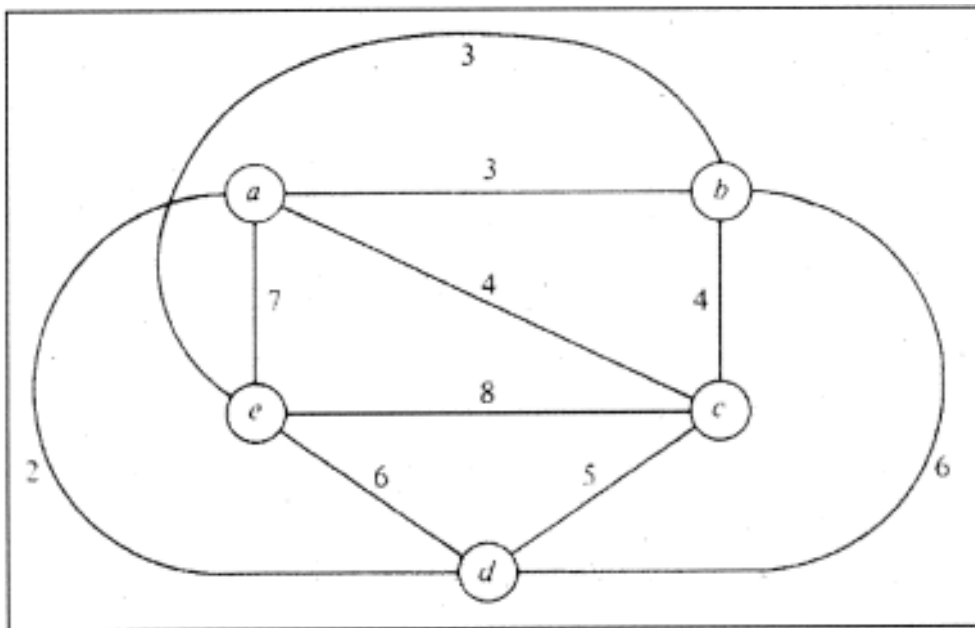
7. Answer the following :

A) State the algorithm for conversion of Infix into Post fix string. Apply the same on given infix expression show its conversion into post fix string. **7**
Infix Expression : ((a + b) + c* (d + e) + f) * (g + h).

B) State the algorithm of Binary search and Linear search and also show the results of the both of the search on given series to find the digit 100 in it. **7**
Series : 6, 35, 98, 13, 89, 77, 55, 103, 613, 100, 19, 61.

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Seat
No.

M.Sc. – I (Semester – I) Examination, 2015
COMPUTER SCIENCE (Old)
Object Oriented Programming Using C++ (Paper – I)

Day and Date : Wednesday, 15-4-2015   Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose the correct alternatives :   **10**

   1) An object is _____
      A) A variable of class data type
      B) Same as a class
      C) Just like a global variable
      D) Collection of data-members and member functions

   2) Wrapping up of data and functions together in a class is known as _____
      A) Overloading   B) Data Abstraction
      C) Polymorphism   D) Encapsulation

   3) Which of the following is not a type of constructor ?
      A) Copy constructor   B) Friend constructor
      C) Default constructor   D) Parameterized constructor

   4) The mechanism of deriving a new class from base class is known as
      _____
      A) Polymorphism   B) Encapsulation
      C) Overloading   D) Inheritance

   5) Which of the following can replace a simple if-else construct ?
      A) Ternary operator   B) While loop
      C) Do-while loop   D) For loop

P.T.O.

6) Which of following concepts means waiting until runtime to determine which function to call ?

   A) Dynamic casting   B) Data hiding

   C) Data binding   D) Dynamic loading

7) Which of the following operator is overloaded for object cout ?

   A) >>   B) <<   C) ?:   D) +

8) Which of the following cannot be used with the keyword virtual ?

   A) Constructor   B) Member function

   C) Class   D) Destructor

9) Which of the following operators cannot be overloaded ?

   A) [ ]   B) ->   C) ?:   D) *

10) The ability to take more than one form is known as

   A) Polymorphism   B) Encapsulation

   C) Constructor   D) Inheritance

B) State whether following statements are **True** or **False** :   **4**

1) A static class function can be invoked by simply using the name of the function alone.

2) Members declared as private in a class are accessible to all member functions of that class.

3) Inheritance provides the idea of reusability.

4) The mechanism of deriving class from another derived class is known as multiple inheritance.

2. A) Write a short note on following :   **8**

   i) Flowchart

   ii) Default arguments.

 B) Answer the following :   **6**

   i) Explain the use of scope resolution operator with example.

   ii) What do you mean by user defined data type ? Explain in short.

3. Answer the following :

   A) What is friend function ? Explain with example. **7**

   B) What is constructor ? Explain parameterized constructor with example. **7**

4. Answer the following :

   A) Write a program in C++ to study Inline function. **7**

   B) What is function overloading ? Explain with suitable example. **7**

5. Answer the following :

   A) Write a C++ program to implement single inheritance. **7**

   B) Explain the importance of virtual function with its characteristics. **7**

6. Answer the following :

   A) What is Template ? Explain function template. **7**

   B) What is manipulator ? Explain the use of width(), precision() and fill() manipulators. **7**

7. Answer the following :

   A) What is File ? Explain the procedure for opening the file. **7**

   B) Write a program to implement Arrays of objects. **7**

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Seat No.

M.Sc. – I (Semester – I) Examination, 2015
COMPUTER SCIENCE
(Paper – II) Numerical Analysis (Old)

Day and Date : Friday, 17-4-2015　　　　　　　　　　Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : i) Question No. **1** and **2** are **compulsory**.
　　　　　　　　 ii) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　 iii) Figures to the **right** indicate **full** marks.
　　　　　　　　 iv) **Use** of simple or scientific calculator is **allowed**.

1. A) Select most correct alternative :　　　　　　　　　　　　　　**10**

　　i) The Newton-Raphson method of finding roots of nonlinear equations falls
　　　under the category of _____ methods.

　　　a) bracketing　　b) graphical　　c) open　　　d) random

　　ii) The number 0.00023 has _____ significant digits.

　　　a) 2　　　　　b) 3　　　　　c) 5　　　　　d) 6

　　iii) The truncation error in calculating $f'(1)$ for $f(x) = x^2$ by $f'(x) \approx \dfrac{f(x + h) - f(x)}{h}$

　　　with h = 0.1 is

　　　a) 0.1　　　　b) -0.1　　　c) 0.2　　　d) -0.2

　　iv) A square matrix A is upper triangular if

　　　a) $a_{ij} = 0, j > i$　　　　　　b) $a_{ij} = 0, i > j$
　　　c) $a_{ij} \neq 0, j > i$　　　　　　d) $a_{ij} \neq 0, i > j$

　　v) The finite difference $y_1 - y_0$, where $y_i = f(x_i)$, is denoted by

　　　a) Δy_0　　　　b) ∇y_1　　　c) $\delta y_{1/2}$　　　d) all of these

vi) The trapezoidal rule is a _____ point Newton-Cotes formula.

    a) three   b) four   c) one   d) two

vii) $(y''')^2 + 5y' = 0$ is a _____ differential equation.

    a) first-degree, third-order   b) third-degree, second-order

    c) third-degree, first-order   d) second-degree, third-order

viii) Interpolation means estimating a value which lies

    a) within the given range of arguments

    b) outside the given range of arguments

    c) outside the range of the dependent variable

    d) none of these

ix) If $x_0 = 8$, $x_1 = 4$ and $f_0 = 20$, $f_1 = 10$ then the first divided difference $f[x_0, x_1] = $ _____

    a) 2   b) 2.5   c) 5   d) –2.5

x) The value of x that satisfies f(x) = 0 is called the

    a) root of an equation f(x) = 0   b) root of a function f(x)

    c) solution of a function f(x)   d) none of these

B) Fill in the blanks :   **4**

    i) A non-algebraic equation is called a _____ equation.

    ii) The first phase of Gauss elimination method is _____ elimination phase.

    iii) The general solution of the differential equation y′ = 6x + 1 is _____

    iv) The Simpson's 1/3 rule is _____ point Newton-cotes formula.

2. A) i) Define an absolute error.

    Given x = 10.00 ± 0.05 and y = 0.0556 ± 0.0002

    Find the maximum value of the absolute error in x + 2y.   **4**

    ii) Define the operators ∇ and E. Show that $1 - E^{-1} \equiv \nabla$.   **4**

B) i) State the theorem which states about the convergence of the root obtained by the iteration method.   **3**

    ii) What is an order of differential equations ?   **3**

3. A) Write an algorithm of finding the root of $f(x) = 0$ by Secant method. **7**

   B) Given the following information :

x	1	3	5	7
$y = f(x)$	101	109	125	149

   Find f(5.2) by using Newton's backward difference interpolation formula. **7**

4. A) Explain Newton's forward difference interpolation formula. **7**

   B) Evaluate the integral $I = \int_{-3}^{3} (x^3 + 1) dx$ by using Simpson's $\frac{3}{8}$ rule with h = 1.

   Verify your results by actual integration. **7**

5. A) Describe Gauss elimination method. **7**

   B) Use Taylor series method to solve the equation

   $\frac{dy}{dx} = x^2 + y^2$ for x = 0.25 and x = 0.5 given y(0) = 1. **7**

6. A) Describe Trapezoidal rule. **7**

   B) Solve the following system of equations by using LU-Decomposition method.

   $3x_1 + 6x_2 + x_3 = 16$

   $x_1 + 3x_2 + 2x_3 = 9$

   $2x_1 + 4x_2 + 3x_3 = 13$ **7**

7. A) Solve the following system of equations by using Gauss-Seidel method.

   $10x - 5y - 2z = 3$

   $4x - 10y + 3z = -3$

   $x + 6y + 10z = -3$ **7**

   B) Find the root of $x^3 - x - 1 = 0$ in the interval (1, 2) by using method of false position. Use at least 5 iterations. **7**

Seat No.

M.Sc. (Part – I) (Semester – I) (Computer Science) Examination, 2015
Paper – III : SOFTWARE ENGINEERING (Old)

Day and Date : Monday, 20-4-2015   Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
              2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
              3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :   **10**

    i) If every requirement can be checked by a cost-effective process, then the SRS is

       a) verifiable   b) traceable

       c) modifiable   d) complete

    ii) Modifying the software to match changes in the ever changing environment is called

       a) adaptive maintenance   b) corrective maintenance

       c) perfective maintenance   d) preventive maintenance

    iii) All activities lying on critical path have slack time equal to

       a) 0   b) 1   c) 2   d) None of above

    iv) Alpha and Beta Testing are forms of

       a) Acceptance testing   b) Integration testing

       c) System testing   d) Unit testing

    v) An object encapsulates

       a) Data   b) Behaviour

       c) State   d) Both data and behaviour

    vi) In function point analysis, number of general system characteristics used to rate the system are

       a) 10   b) 14   c) 20   d) 12

vii) Aggregation represents

    a) is_a relationship   b) part_of relationship

    c) composed_of relationship   d) none of above

viii) Number of clauses used in ISO 9001 to specify quality system requirements are

    a) 15   b) 20   c) 25   d) 28

ix) ER model shows the

    a) Static view   b) Functional view

    c) Dynamic view   d) All the above

x) The tools that support different stages of software development life cycle are called

    a) CASE tools   b) CAME tools

    c) CAQE tools   d) CARE tools

B) Fill in the blanks or **True** / **False** :   **4**

i) In the context of requirements analysis, partitioning results in the elaboration of data, function, or behavior.

    A) True   B) False

ii) Units and stubs are not needed for unit testing because the modules are tested independently of one another

    A) True   B) False

iii) The software metrics chosen by an organization are driven by the business or technical goals an organization wishes to accomplish.

    A) True   B) False

iv) The goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.

    A) True   B) False

2. A) Write short notes on the following :   **8**

    i) Architectural Design Optimization

    ii) Software Quality Assurance.

B) Answer the following :   **6**

    i) What is Engineering Design Process ?

    ii) Enlist various Design Principles.

3. Answer the following : **14**

   A) Explain Software Cost Estimation in detail.

   B) Explain the Modular Design with necessary diagrams.

4. Answer the following : **14**

   A) What is Software Prototyping ? Explain the prototyping approaches in software process ?

   B) What is Analysis Concept ? Explain its principles.

5. Answer the following : **14**

   A) Explain in brief elements of Analysis Model.

   B) Discuss in brief the Interface design.

6. Answer the following : **14**

   A) Explain Unit Testing and Structural Testing in detail.

   B) Explain Software Cost Estimation in detail.

7. Answer the following : **14**

   A) Explain in brief Management of object-oriented software projects.

   B) Discuss in brief characteristics and Components of Software.

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Seat No.

M.Sc. (Part – I) (Semester – I) Examination, 2015
COMPUTER SCIENCE
Pape – IV : Data Structures (Old)

Day and Date : Wednesday, 22-4-2015　　　　　　　　Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
　　　　　　　2) Attempt **any three** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　3) Figures to **right** indicate **full** marks.

1. A) Choose the correct alternatives : 　　　　　　　　　　　　　　**10**

　1) Two dimensional arrays are also called _____

　　a) Matrix arrays　　　　　　b) Merged array

　　c) One dimensional array　　d) None of above

　2) When new data are to be inserted into a data structure, but there is no available space; this situation is usually called _____

　　a) underflow　　　　　　　　b) saturated

　　c) houseful　　　　　　　　　d) overflow

　3) A data structure where elements can be added or removed at either end but not in the middle.

　　a) Linked lists　　　　　　　b) Stacks

　　c) Queues　　　　　　　　　d) Deque

　4) Which of the following case does not exist in complexity theory ?

　　a) Best case　　　　　　　　b) Null case

　　c) Average case　　　　　　d) Worst case

　5) Finding the location of the element with a given value is

　　a) Insertion　　　　　　　　b) Search

　　c) Sort　　　　　　　　　　d) None of above

P.T.O.

6) Which data structure allows deleting data elements from front and inserting at rear ?

   a) Stacks   b) Queues

   c) Binary search tree   d) Sort

7) To represent hierarchical relationship between elements, which data structure is suitable ?

   a) Deque   b) Priority

   c) Tree   d) All of above

8) The term data structure refers to _____ and interrelationship between them.

   a) Coding standards   b) Programming language statements

   c) Organization of the data   d) None of these

9) What is the linked list that contains a variable whose value is the address of the location of the other node in the list ?

   a) Integer   b) Pointer

   c) Char   b) Void

10) A "stack" is also known as what ?

   a) A FIFO   b) A LIFO

   c) A Queue   d) A Linked List

B) State whether **True** or **False** :   **4**

   1) A linked list is either empty structure or in which every node has either no children, a left child, right child or both a left and a right child.

   2) The Insertion sort is also known as pushdown list.

   3) Priority queue is nothing but the double ended queue.

   4) In Sparse Matrix, almost all its elements are zero.

2. A) Write short notes on following :   **8**

   1) Array

   2) Backtracking.

B) Answer the following : **6**

i) Explain in brief the different data type.

ii) What do you mean by recursion ?

3. Answer the following :

A) Define tree. Construct binary search tree of following series. Justify your answer. **7**

Series : 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6 and 18.

B) What do you mean by Queue ? Discuss various operations on it with suitable example. **7**

4. Answer the following :

A) Define Algorithm. Discuss problem of Tower of Hanoi by considering three peg having three discs to be moved all from one peg to another. **7**

B) Define doubly linked list. Discuss the insertion operation on it by inserting data at the beginning, middle and end of list with suitable example. **7**

5. Answer the following :

A) State the principle of conversion from infix to postfix polish notation. Convert following expression from infix to postfix using stack.
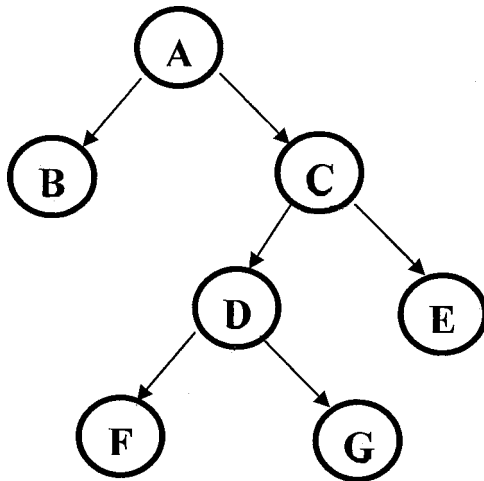
Infix String : A*((B + C) − (D/E)) + F. **7**

B) Discuss working of Greedy search on following graph. Justify your answer. **7**
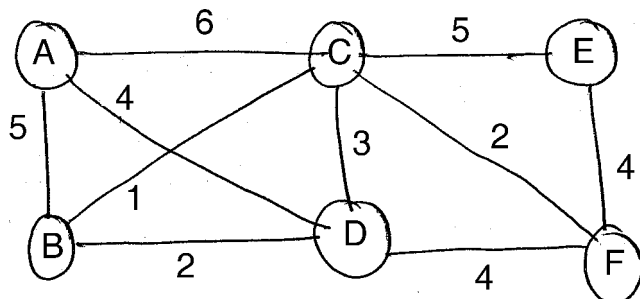
6. Answer the following :

A) Define Data Structure. Explain the complexity of an algorithm in detail. **7**

B) What do you mean by traversing ? From the following binary tree, state the result of pre-order and post-order traversal. **7**

7. Answer the following :

A) What do you mean by sorting ? Perform Bubble sort on following series : **7**

Series : 63, 25, 1,80, 37, 92, 45, 77, 105, 59.

B) Define Stack. Discuss its principle, various operations and its applications. **7**

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Seat
No.

M.Sc. – I (Semester – II) (New) Examination, 2015
COMPUTER SCIENCE (Paper – V)
Java Programming

Day and Date : Thursday, 16-4-2015　　　　　　　　　　Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** are **2** are **compulsory**.
　　　　　　　　2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :　　　　　　　　　　　　　　　　**10**

　　1) What is the correct ordering for the import, class and package declarations when found in a single file ?
　　　　a) package, import, class　　　b) class, import, package
　　　　c) import, package, class　　　d) package, class, import

　　2) _____ is an abstract computer which runs the compiled Java programs.
　　　　a) Javac　　　b) Javadoc　　c) Javap　　　d) JVM

　　3) Methods _____ and _____ are executed only once during the life time of applet.
　　　　a) paint( ) and destroy( )　　　b) init( ) and start( )
　　　　c) init( ) and destroy( )　　　d) start( ) and stop( )

　　4) What is the output of the following program ?
```
public class test {
        public static void main(String arg[ ]) {
                double x = 10;
                int r;
                r = (int) (++x)%22;
                System.out.print(r);
        }
}
```
　　　　a) 0　　　　　　b) 2　　　　　c) 2.2　　　　d) 11

P.T.O.

5) What is the default container layout for Applet ?

   a) FlowLayout   b) CardLayout

   c) BorderLayout   d) GridLayout

6) Which of the following is not valid Java floating point literal ?

   a) 4.5f   b) .033D   c) 5.0e^2   d) 6.8

7) If an expression contains double, int, float, long, then whole expression will promoted into which of these data types ?

   a) long   b) int   c) double   d) float

8) _____ is at the top of the exception class hierarchy.

   a) try   b) throwable

   c) exception class   d) catch

9) In Java thread to thread communication is called _____

   a) passing   b) sending   c) messaging   d) calling

10) Java is designed for _____ environment of the internet.

   a) development   b) deducting

   c) distributed   d) web design

B) Write whether **true** or **false** :   **4**

   1) A *final* value cannot be updated.

   2) *ClassNotFoundException* is thrown by the *read( )* method of *InputStream* class.

   3) A user cannot override static methods in Java.

   4) A class may implement a number of Interfaces.

2. A) Write short notes on the following :   **8**

   i) Abstract Class

  ii) *Super* keyword.

B) Answer the following :   **6**

   i) Describe ResultSet class.

  ii) What is the difference between Exception and Error in Java ?

3. Answer the following :

a) Explain the concept of inheritance. How a class is inherited in Java ? **6**

b) A library charges a fine for every book returned late. For first 5 days the fine is 50 paise, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message. **8**

4. Answer the following :

a) Describe how radio button is put on applet ? Describe how an event generated by a radio button is handled ? **7**

b) What is applet ? Describe how to create and execute an applet. **7**

5. Answer the following :

a) What is an array ? With example describe how one and two dimensional arrays are created in Java. **8**

b) How to define abstract methods ? What is difference between ordinary and abstract method ? **6**

6. Answer the following :

a) If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402. **6**

b) Explain various kinds of streams in Java. **8**

7. Answer the following :

a) What is the importance of finally block in exception handling ? How does finally block differ from finalize( ) method ? **7**

b) Explain different ways of creating a thread. **7**

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Seat No.

M.Sc. – I (Semester – II) (Computer Science) Examination, 2015
Paper – VI : COMPUTER COMMUNICATION NETWORK (New)

Day and Date : Saturday, 18-4-2015
Time : 11.00 a.m. to 2.00 p.m.

Max. Marks : 70

Instructions *: 1)* *Question No.* ***1*** *and* ***2*** *are* ***compulsory***.
2) *Attempt* ***any 3*** *questions from Q. No.* ***3*** *to Q. No.* ***7***.
3) *Figures to the* ***right*** *indicate* ***full*** *marks.*

1. A) Choose correct alternatives :　　　　　　　　　　　　　　　　　　　　**10**

　　1) Networks in a older, unwired buildings is

　　　　a) Wireless and mobile　　　　　b) Wired and mobile

　　　　c) Wireless and non-mobile　　　d) Wired and non-mobile

　　2) Based on the interprocessor distance which of the following is in smaller to larger distance ?

　　　　a) PAN, LAN, MAN, WAN　　　b) LAN, PAN, MAN, WAN

　　　　c) LAN, PAN, WAN, MAN　　　d) PAN, LAN, WAN, MAN

　　3) Three army problem in network layer may arise during

　　　　a) Connection establishment　　b) Connection release

　　　　c) Data transfer　　　　　　　　d) All above

　　4) Which of the following statement is false with reference to remote procedure call ?

　　　　a) Through RPC the pointers can be passed between client and server

　　　　b) Client procedure and client stud will be in same address space

　　　　c) RPC makes a remote procedure call which look as much as possible like a local one

　　　　d) In an RPC the reply from server takes same path in which the call has arrived

　　5) ADCCP stands for _____

　　　　a) Advanced Data Communication Control Procedure

　　　　b) Auto Data Communication Control Procedure

　　　　c) Advance Data Control and Communication Procedure

　　　　d) Auto Data Control and Communication Procedure

P.T.O.

6) The minimum size of the point-to-point protocol frame, excluding payload field, is _____

   a) 5 bytes   b) 7 bytes

   c) 9 bytes   d) 10 bytes

7) In TCP congestion is caused _____

   a) At source   b) In network

   c) At destination   d) At any where among the above

8) The main objective of transactional TCP is _____

   a) To increase transaction between client and server

   b) To reduce the number of packets between client and server for any transaction

   c) To reduce the errors and packet loss during transactions between client and server

   d) To have secure communication for transaction between client and server

9) Which of the following is not a field in the resource records ?

   a) Value   b) Domain name

   c) Version   d) Class

10) For email services after establishment of connection the POP3 protocol goes through the following sequence of states.

   a) Authorization, Transactions, Update

   b) Authorization, Transactions, Disconnection

   c) Connection, Transactions, Disconnection

   d) Connection, Transactions, Update

B) Fill in the blanks :   **4**

1) G2C stands for _____

2) For congestion control in datagram the line utilization parameter u is updated as per the equation _____

3) ADSL means _____

4) Web does not need login to access. This property of web is called as _____

2. A) Write short notes on the following :   **8**
     i) ARPANET
     ii) Mobile IP.

   B) Answer the following :   **6**
     i) How flow control managed in data link layer ?
     ii) Explain real time transport protocol.

3. Answer the following :   **14**

   A) Discuss protocol hierarchies in network software.

   B) What are the error correcting codes ? Briefly discuss them.

4. Answer the following :   **14**

   A) Describe the protocol using selective repeat in data link layer.

   B) How the connectionless service is implemented in network layer ? Explain.

5. Answer the following :   **14**

   A) Explain routing in mobile networks.

   B) Discuss IPV6 architecture and issues.

6. Answer the following :   **14**

   A) How the crash recovery happens in the transport layer ? Discuss.

   B) Explain congestion control in TCP.

7. Answer the following :   **14**

   A) What is user agent ? Explain its functionalities.

   B) Write a note on HTTP.

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Seat No.

M.Sc. – I (Semester – II) (Computer Science) (New) Examination, 2015
Paper – VII : UML

Day and Date : Tuesday, 21-4-2015　　　　　　　　　　　　　Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No.**1** and **2** are **compulsory**.
　　　　　　　　2) Attempt **any 3** questions from Q. No. **3** to Q.No.**7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives.　　　　　　　　　　　　　　　　　**10**

　　1) UML interfaces are used to

　　　　a) Define an API for all classes.

　　　　b) Program in Java, but not in C++ or Smalltalk

　　　　c) Define executable logic to reuse across classes

　　　　d) Specify required services for types of objects

　　2) Which of the following statement is true about visibility ?

　　　　a) UML uses # for public element

　　　　b) UML uses-for private element

　　　　c) UML uses * for protected element

　　　　d) All of the above

　　3) Which statement is true ?

　　　　a) The UML is a development process for software intensive systems.

　　　　b) The UML is a process-dependent language used for visualizing software artifacts.

　　　　c) The UML is a modeling language for software blueprints.

　　　　d) The UML is a visual programming language.

4) Which statement is true about attributes ?

   a) They cannot change once the object is instantiated

   b) They change value from object to object of the same class

   c) They can only be primitives

   d) They are required for every class

5) Which view focuses on the physical realization of the system ?

   a) Logical View   b) Implementation View

   c) Process View   d) Use-Case View

6) A state chart diagram describes

   a) Attributes of objects

   b) Nodes of the system

   c) Operations executed on a thread

   d) Events triggered by an object

7) The sequence diagram models

   a) The order in which the class diagram is constructed

   b) The way in which objects communicate

   c) The relationship between states

   d) The components of the system

8) The activity diagram

   a) Focuses on flows driven by internal processing

   b) Models the external events stimulating one object

   c) Focuses on the transitions between states of a particular object

   d) Models the interaction between objects

9) Which among these are the notations which are used to represent software architecture ?

   a) UML activity diagram

   b) UML use case diagram

   c) UML class diagram, interaction diagram

   d) All of the mentioned

10) If you need to show the physical relationship between software components and the hardware in the delivered system, which diagram can you use ?

a) Component diagram b) Deployment diagram

c) Class diagram d) Network diagram

B) Write whether **true** or **false**. **4**

1) An actor is a role a user plays with respect to the system.

2) In sequence diagram object deletion, indicated by a large X.

3) Package is a grouping mechanism that can be applied to classes only.

4) A guard is a logical condition that will return either "true" or "false".

2. A) Write short notes on the following : **8**

i) Grouping and Annotational things

ii) Association.

B) Answer the following : **6**

i) Consider the program fragment given below.

Class Student {

public int roll = 100;

public String name = "Ajay";

private mark1 = 65;

private mark2 = 35;

public void display ();

public int result ();

}

Draw the UML notation of Student class

ii) What are the advantages of using UML ?

3. Answer the following :

a) Explain UML Software Development Life Cycle. **7**

b) By using classes one can model the vocabulary of a system. What are the steps used to model the vocabulary of a system. Draw a figure showing the vocabulary of *Library System of a college*. **7**

4. Answer the following :

   a) Explain building blocks of UML. **8**

   b) Explain with example abstract, root, and polymorphic elements. **6**

5. Answer the following :

   a) What are the parts of a deployment diagram ? **7**

   b) What is a package ? How it is represented in UML ? Describe importing and exporting of packages. **7**

6. Answer the following :

   a) Explain with example that class diagrams may be used to model a logical database schema. **6**

   b) What is an interaction diagram ? What is the difference between sequence diagram and collaboration diagram ? With example describe sequence diagram. **8**

7. Answer the following :

   a) What are the elements of Use Case Diagram ? Draw a use case diagram to model the behavior of a cellular phone. **8**

   b) Describe forking and joining. **6**

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Seat No.	

M.Sc. – I (Semester – II) (New) Examination, 2015
COMPUTER SCIENCE
DBMS (Paper – VIII)

Day and Date : Thursday, 23-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N.B. : 1) Question No. **1** and **2** are **compulsory**.
  2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
  3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives : **10**

   1) An entity set that does, not have sufficient attributes to form a primary key is a _____

   a) Strong entity set b) Weak entity set

   c) Simple entity set d) Primary entity set

   2) Which normal form is considered adequate for relational database design ?

   a) 2 NF b) 3 NF c) 4 NF d) BCNF

   3) When several users access the database at the same time, it is said to be ?

   a) Concurrent storing b) Connection trap

   c) Database management d) Integrated data

   4) A locked file can be

   a) Accessed by only our user

   b) Modified by users with the correct password

   c) Is used to hide sensitive information

   d) Both b) and c)

   5) The database schema is written in

   a) HLL b) DML c) DDL d) DCL

6) In a relational model relations are termed as

    a) Tuples   b) Attributes

    c) Tables   d) Rows

7) A _____ ensures that transactions execute atomically.

    a) Integrity control algorithm

    b) Local applications

    c) Concurrency control algorithm

    d) None of the above

8) _____ refers to a formal process for determining which fields belong to which tables in a relational database.

    a) Normalization   b) De-normalization

    c) Aggregation   d) None of these

9) The statement in sql which allows to change the definition of a table is

    a) Alter   b) Update   c) Create   d) Select

10) The Data Control Language (DCL)

    a) Is used to manage user access to databases

    b) Is used to manipulate the contents of a database in some form

    c) Both a) and b)

    d) None of the above

B) State **True/False** :   **4**

    1) Database does, not removes data redundancy and inconsistency.

    2) Cardinality of a relation refers to number of columns in a table or relation.

    3) The external view determines how the data are actually stored in some physical storage unit in the computer system.

    4) A candidate key which is not a primary key is known as alternate key.

2. A) Write short notes on the following : **8**

   i) Data replication

   ii) Two phase commit protocol.

  B) Answer the following : **6**

   i) Explain Data definition language with example.

   ii) Explain order by and group by clause with example.

3. Answer the following :

  A) Define DBMS. Explain three level architecture proposal for DBMS. **7**

  B) Define Data Model. Explain Entity Relationship model and relational model. **7**

4. Answer the following :

  A) What is meant by Normalization ? Explain 4 NF and 5 NF with suitable example. **7**

  B) Explain aggregate functions used in SQL. **7**

5. Answer the following :

  A) What is meant by Transaction Management ? Explain various transaction states. **7**

  B) Explain the concept of Data Fragmentation with suitable example. **7**

6. Answer the following :

  A) Explain advantages of optimization in query processing. **7**

  B) What is meant by database recovery ? Explain the need for recovery. **7**

7. Answer the following :

  A) What is meant by views in SQL ? Explain how we can create views in SQL. **7**

  B) Explain the concept of shadowing in database recovery. **7**

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Seat No.

M.Sc. – I (Semester – II) Examination, 2015
COMPUTER SCIENCE (Old)
Operations Research (Paper – V)

Day and Date : Thursday, 16-4-2015   Max.Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

N.B. : 1) Attempt **any five** questions.

2) Q. No. **1** and Q. No. **2** are **compulsory**.

3) Attempt **any three** from Q. No. **3** to Q. No. **7**.

4) Figures to the **right** indicate **full** marks.

1. A) Fill in the blanks (**one** mark **each**) :   **7**

   1) The set of all convex combinations of sets of points from X is
      _____

   2) The payoff (V_{rs}) at the saddle point (r, s) is called the _____
      of game.

   3) A simplex in one dimension is a _____

   4) If the primal problem has an unbounded optimum solution the dual
      problem has _____ solution.

   5) The criteria of leaving vector ensures the _____ condition
      while the criteria for entering vector ensures the _____
      condition.

   6) A basic feasible solution is said to be non-degenerate if all m basic
      variables are _____ and remaining n variables will be zero.

   7) Gomory's cutting plane method is used for solving _____
      programming problem.

B) Choose the correct alternative (**one** mark **each**) : **4**

1) If x_js are feasible solutions to LPP then,

   a) $x_j > 0$ b) $x_j \geq 0$ c) $x_j = 0$ d) $x_j \leq 0$

2) The equation of hyperplane in R^n is _____

   a) $CX \leq Z$ b) $CX \geq Z$

   c) $CX = Z$ d) Any one of these

3) If i^{th} constraint in the primal LPP is an equality then the corresponding i^{th} dual variable is _____

   a) restricted to less than zero

   b) restricted to greater than zero

   c) unrestricted in sign

   d) none of these

4) Consider two statements

   I) Every Feasible solution to LPP is also a solution.

   II) Every solution to LPP is Feasible solution.

   a) only I is true   b) only II is true

   c) both are true   d) both are false

C) State **true** or **false** (**one** mark **each**) : **3**

1) In a convex set the line joining any two points in the set lies entirely in side the set.

2) An extreme point always lies in between any other two points of a set.

3) In dual simplex method if $z_j - c_j < 0$ the method is not applicable.

2. a) What are the disadvantages of Big-M method over two phase method ? **3**

  b) For any points X, Y $\in$ R^n show that the line [X : Y] is a convex set. **4**

  c) Define :

   i) Slack variable

   ii) Surplus variable

  Illustrate each definition with an example. **4**

d) Find the dual of the following LP problem   **3**

$$\text{Min. } z = x_1 + x_2 + x_3$$

Subject to the constraints,

$$x_1 - 3x_2 + 4x_3 = 5$$

$$x_1 - 2x_2 \leq 3$$

$$2x_2 - x_3 \geq 4$$

$x_1, x_2 \geq 0$ and x_3 is unrestricted.

3. a) If the convex set of the feasible solutions of $AX = b$, $b \geq 0$ is convex polyhedron then prove that atleast one of the extreme points gives an optimal solution. Further if the solution occurs at more than one extreme point then the value of objective function will be the same for all convex combinations of these extreme points.   **7**

b) Solve the problem by Two phase method :

$$\text{Min. } z = x_1 + x_2$$

Subject to the constraints ,

$$2x_1 + x_2 \geq 4$$

$$x_1 + 7x_2 \geq 7$$

and $x_1, x_2 \geq 0$.   **7**

4. a) If the kth constraint of the primal is an equality then P.T. the dual variable w_k is unrestricted in sign.   **7**

b) Solve the following LPP by Dual Simplex Method :

$$\text{Max } z = -2x_1 - x_3$$

Subject to the constraints,

$$x_1 + x_2 - x_3 \geq 5$$

$$x_1 - 2x_2 + 4x_3 \geq 8 \text{ and } x_1, x_2, x_3 \geq 0.$$ **7**

5. a) Explain the construction of Gomorian constraint used in Gomory's method to solve integer programming problem. **7**

   b) Give the computational procedure of Beale's method to solve quadratic programming problem. **7**

6. a) Explain the algorithm used for solving linear programming problem by simplex method. **7**

   b) Solve the following integer programming problem : **7**

   $$\text{Max } z = x_1 + 4x_2$$

   Subject to the constraints

   $$2x_1 + 4x_2 \leq 7$$

   $$5x_1 + 3x_2 \leq 15$$

   and $x_1, x_2 \geq 0$ and integers.

7. a) Solve the following 2 × 3 game graphically. **8**

   Player B

   Player A $\begin{bmatrix} 1 & 3 & 1 \\ 8 & 5 & 2 \end{bmatrix}$

   b) Define the terms : **6**

      i) Saddle point

      ii) Optimal strategies

      iii) Value of game.

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Seat No.

M.Sc. – I (Semester – II) (Computer Science) Examination, 2015
Paper – VI : COMPUTER COMMUNICATION NETWORK (Old)

Day and Date : Saturday, 18-4-2015   Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :   **10**

   1) Networks in older, unwired building are
      a) neither mobile nor wireless
      b) mobile but not wireless
      c) not mobile but wireless
      d) mobile as well as wireless

   2) In a virtual circuit subnet quality of service is
      a) difficult to implement
      b) easy if enough resource is allocated
      c) dependent on the subnet architecture
      d) all the above

   3) In selective flooding algorithm router forwards
      a) selected packets further
      b) non-duplicates packets only
      c) towards best known path only
      d) packets to only those lines that are going in right direction

   4) The IP address 221.15.175.5 belongs to class
      a) A   b) B   c) C   d) D

   5) In Berkeley sockets BIND primitive is used for
      a) creating a new communication end point
      b) attach a local address to a socket
      c) block the caller until a connection attempt arrives
      d) announce willingness to accept connections

6) The TCP port number 80, which is http, is used for
   a) hyper text transfer
   b) e-mail
   c) world wide web
   d) all the above

7) Which one of the following protocol delivers/stores mail to receiver server ?
   a) simple mail transfer protocol
   b) post office protocol
   c) internet mail access protocol
   d) hypertext transfer protocol

8) The OSI Reference Model layers, in order from top to bottom, are
   a) Application, Physical, Session, Transport, Network, Data Link, Presentation
   b) Application, Presentation, Network, Session, Transport, Data Link, Physical
   c) Physical, Data Link, Network, Transport, Session, Presentation, Application
   d) Application, Presentation, Session, Transport, Network, Data Link, Physical

9) In asymmetric key cryptography, the private key is kept by
   a) sender
   b) receiver
   c) sender and receiver
   d) all the connected devices to the network

10) What is Data Encryption Standard (DES) ?
   a) bit cipher
   b) stream cipher
   c) block cipher
   d) code cipher

B) Fill in the blanks or **True/False** : **4**

1) Maximum payload of ATM cells is _____ bytes.

2) _____ is a way sending a message to a remote host and getting a reply back is a lot like making a function call in a programming language.

3) Tables were introduced in HTML _____

4) The first public-key algorithm developed by Merkle and Hellman in 1978 is _____ algorithm.

2. A) Write short notes on the following : **8**

   i) IPV6

   ii) Transactional TCP.

  B) Answer the following : **6**

   i) Discuss advantages and disadvantages of flooding algorithm.

   ii) Explain transposition cipher with example.

3. Answer the following : **14**

  A) Explain connection oriented and connectionless services. Give their comparison.

  B) What is token bucket algorithm ? How it works ? Explain.

4. Answer the following : **14**

  A) Discuss hierarchical routing with an example.

  B) How interior gateway routing protocol functions ? Explain.

5. Answer the following : **14**

  A) Discuss the issues related to connection establishment in transport layer.

  B) Describe real time transport protocol.

6. Answer the following : **14**

  A) Discuss email architecture and services.

  B) Write a note on i-mode system.

7. Answer the following : **14**

  A) What are the fundamental cryptographic principles ? Discuss them.

  B) How message digests differ from public key signatures ? How message digests work ? Explain.

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Seat No.

M.Sc. – I (Sem. – II) (Computer Science) Examination, 2015
UML (Old) (Paper – VII)

Day and Date : Tuesday, 21-4-2015   Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
              2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
              3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :   **10**

    1) An architect looks at two classes

       The first class has the following operations :

       getName( ),getSize( ),getTotal( ), and findAverage( ).

       The second class has the following operations :

       getName( ), getSize( ), findAverage( ), findMinimum( ), and findMaximum( ).

       The two classes share the same superclass. Which operations are most likely contained in the superclass ?

       a) getName( ), getSize( ), and findAverage( )

       b) findMaximum( ), findMinimum( ), getSize( ), and getTotal( )

       c) getName( ), findAverage( ), and findMaximum( )

       d) getName( ), getSize( ), getTotal( ), and findAverage( )

    2) Which of the following is a named object in UML ?

       a) Matt:Employee   b) Employee

       c) Matt::Employee   d) ::employee

    3) Which of the following three processes are best suited for UML ?

       i) use-case driven

       ii) waterfall development-based

       iii) iterative and incremental

       iv) architecture-centric

       a) i, ii and iii   b) i, iii and iv   c) ii, iii and iv   d) i, ii and iv

4) Package diagrams are designed for
   a) organizing a large project into components
   b) depicting the overall structure of a system
   c) assisting testing
   d) assisting deployment

5) "*Protected*" visibility is shown by the symbol _____
   a) &   b) +   c) #   d) *

6) _____ is the specification of an asynchronous stimulus communicated between instances.
   a) Node   b) Component
   c) Signal   d) Interface

7) When a class participates in an association, it has a specific _____ that it plays in the relationship.
   a) role   b) value   c) student   d) teacher

8) Aggregation is specified by adorning a plain association with _____ at the *whole* end.

   a) ⊙   b) ☐   c) △   d) ◇

9) A _____ is a relationship between a general thing and a more specific kind of that thing.
   a) Dependency   b) Generalisation
   c) Association   d) None of these

10) Which two characteristics do all objects have ?
   i) primitives
   ii) state and behavior
   iii) interfaces
   iv) a unique identity
   a) i) and ii)   b) iii) and iv)   c) ii) and iv)   d) i) and iv)

B) State whether **true/false** :   **4**

   1) The UML is a visual programming language.

   2) Single inheritance means a semantic variation of generalization in which a child may have only one parent.

   3) Sequence diagram is an interaction diagram that emphasizes the time ordering of messages.

   4) Nodes represent the physical deployment of components.

2. A) Write short notes on the following : **8**
    i) Stereotypes
    ii) Association.

   B) Answer the following : **6**
    i) What are different aims that are achieved through modeling ?
    ii) Where can the UML be used ?

3. Answer the following :

   a) There are two different types of interaction diagrams : sequence and collaboration diagrams. Compare the two types of diagrams. What are the key differences between those diagram types considering their characteristics and their application ? **8**

   b) What diagram type(s) can be used to describe the following : **6**
    • Specialization of user roles and their interactions with a system.
    • Organization of a large amount of classes.
    • Life-cycle dependencies of objects.

4. Answer the following :

   a) Explain object diagram with example. **7**

   b) What is association ? Describe the navigation, visibility and qualification properties with example. **7**

5. Answer the following :

   a) Describe interface, types and roles with example. **6**

   b) What is forward engineering ? What are the steps involved in forward engineering of class diagram ? Give example. **8**

6. Answer the following :

   a) What are the classes required for Order Processing System ? Show the details of relationships among these classes using class diagram. **8**

   b) What is the purpose of a deployment diagram ? Differentiate nodes and components. **6**

7. Answer the following :

   a) Describe use cases that a Restaurant provides to the customers. Draw the Use Case Diagram of the same. **8**

   b) Describe State machines. What are the different parts of a state ? **6**

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SLR-CP – 195

Seat No.	

M.Sc. – I (Semester – II) Examination, 2015
COMPUTER SCIENCE (Old)
DBMS (Paper – VIII)

Day and Date : Thursday, 23-4-2015   Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :   **10**

   1) The view of total database content is _____

      A) Conceptual view   B) Internal view

      C) External view   D) Physical view

   2) DML is provided for _____

      A) Description of logical structure of database

      B) Addition of new structures in the database system

      C) Manipulation and processing of database

      D) Definition of physical structure of database system

   3) 'AS' clause is used in SQL for _____

      A) Selection operation   B) Rename operation

      C) Join operation   D) Projection operation

   4) Architecture of the database can be viewed as _____

      A) two levels   B) four levels

      C) three levels   D) one level

   5) An entity set that does not have sufficient attributes to form a primary key is a _____

      A) strong entity set   B) weak entity set

      C) simple entity set   D) primary entity set

P.T.O.

6) In a hierarchical model records are organized as _____

   A) Graph   B) List   C) Links   D) Tree

7) The property/properties of a database is/are _____

   A) It is an integrated collection of logically related records

   B) It consolidates separate files into a common pool of data records

   C) Data stored in a database is independent of the application programs using it

   D) All of the above

8) The statement in SQL which allows to change the definition of a table is _____

   A) Alter   B) Update   C) Create   D) Select

9) E-R model uses _____ symbol to represent weak entity set.

   A) Dotted rectangle   B) Diamond

   C) Doubly outlined rectangle   D) None of these

10) Relational Algebra is _____

   A) Data definition language   B) Meta language

   C) Procedural query language   D) None of the above

B) State **true** or **false** :   **4**

   1) A composite index is simply an index based on more than one column in a table.

   2) Union set operator performs all rows from both select statements with duplicate rows shown.

   3) Network model is based on the tree like structure with many roots.

   4) Data constitutes the building blocks of information.

2. A) Write short notes on :   **8**

   i) Users of DBMS

   ii) Views.

  B) Answer the following :   **6**

   i) Explain specialization

   ii) Explain three level architecture of DBMS.

3. Answer the following : **14**

   A) Explain the following relational algebra –

   Select, Project, Union, Cartesian product, Intersect.

   B) What is normalization ? Explain 1st, 2nd and 3rd normal form in detail.

4. Answer the following : **14**

   A) Explain ACID properties in detail.

   B) Explain database architecture in detail.

5. Answer the following : **14**

   A) Explain client-server architecture in detail. Specify its advantages.

   B) Explain locking methods in detail.

6. Answer the following : **14**

   A) Explain the steps in query processing.

   B) What is exception ? Specify its types and explain with example.

7. Answer the following : **14**

   A) Explain log-based recovery in detail.

   B) Explain group by clause and order by clause in detail with example.

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Seat No.	

M.Sc. – II (Semester – III) (Computer Science) Examination, 2015
JAVA PROGRAMMING (Paper – IX)

Day and Date : Wednesday, 15-4-2015 Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose the correct alternatives : **10**

   I) Which will legally declare, construct and initialize an array ?

   A) int [] myList = {"1", "2", "3"};   B) int [] myList = (5, 8, 2);

   C) int myList [] [] = (4, 9, 7, 0);   D) int myList [] = {4, 3, 7};

   II) A compiler converts the Java program into an intermediate language\
   representation called

   A) Bytecode   B) Byte

   C) Byteclass   D) Bytejava

   III) A collection of methods with no implementation is called an _____

   A) Polymorphism   B) Inheritance

   C) Interface   D) Data Binding

   IV) Which of the following is not a wrapper class ?

   A) Vector   B) Character

   C) Boolean   D) Integer

   V) The _____ class creates and maintains a buffer for an input stream.

   A) Common Buffered Input Stream   B) Buffered Stream

   C) Input Stream   D) Buffered Input Stream

   VI) Which of the following is not a Exceptions in Java ?

   A) Arithmetic Exception   B) Nullpointer Exception

   C) Arrayout of Bounds Exception   D) Logical Exception

P.T.O.

VII) Which of the following is WRONG statement with respect to rules for overriding methods ?

A) The method name and the order of arguments should be identical to that of the superclass method

B) The return type of both the methods must be the different

C) The overriding method cannot be less accessible than the method it overrides

D) An overriding method cannot raise more exceptions than those raised by the superclass

VIII) The class at the top of the exception classes hierarchy is called _____

A) Common   B) Throwable

C) NULL   D) Catch

IX) Which of the following is not a Looping statement _____

A) FOR   B) Switch   C) While   D) Do-while

X) _____ is the ability of an Java application to perform multiple tasks at the same time.

A) Multiprogramming   B) Multithreading

C) Multiprocessing   D) Multitasking

B) State **true/false** :   4

i) All binary operators except for the assignment operators are evaluated from Left to Right.

ii) Garbage collection is manual process.

iii) In an instance method or a constructor, "this" is a reference to the current object.

iv) Assignment operator is evaluated Left to Right.

2. A) Write short notes on the following :   8

i) Features of Java

ii) One, two dimensional arrays and array of objects.

B) Answer the following :   6

i) Explain difference between classes and objects with example.

ii) Explain why main function in Java contains string arg[] not Integer, Float, Double, Character ?

3. Answer the following : **14**

   A) What is thread ? Explain thread synchronization with example.

   B) WAP for creating custom Exception Age Wise ?
      i) AgeMinorException (Age 1-18)
      ii) AgeMajorException (Age-18-99).

4. Answer the following : **14**

   A) Explain static variable method, block with example.

   B) WAP to copy contents of one file to another file using Data Input Stream and Data Output Stream classes.

5. Answer the following : **14**

   A) WAP demonstrating same class name in 2 different package with different definition and using both the classes in one program.
      (Ex.P1 → Student class taking personal information of student and P2 → Student class taking academic information of student).

   B) What is interface ? Explain how to achieve multiple inheritance in Java.

6. Answer the following : **14**

   A) What is Serialization ? Explain how to achieve serialization in Java.

   B) WAP for string manipulations as
      i) Read 5 strings and search a string using Command Line Arguments.
      ii) Sorting strings with case
      iii) Sorting strings ignoring case
      iv) String starting with a given letter.

7. Answer the following : **14**

   A) Differentiate JDBC and ODBC. Explain different types of JDBC drivers.

   B) Assume that there is a table named as student in MS-Access with the following fields : empid, ename, eaddress, salary, eph_no. Write a java program to insert and then display the records of the table using JDBC.

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SLR-CP – 197

Seat No.

M.Sc. (Part – II) (Semester – III) Examination, 2015
COMPUTER SCIENCE (Paper – X)
Artificial Intelligence

Day and Date : Friday, 17-4-2015   Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
　　　　　　　　2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives :   **10**

　　1) The process of solving the problem can usefully be modeled as _____

　　　　a) semantic analysis　　　　　b) generate and test

　　　　c) production system　　　　　d) none of these

　　2) A _____ is a flat area of search space in which whole set of
　　　　neighboring states have the same value.

　　　　a) Local maximum　　　　　b) Plateau

　　　　c) Back track　　　　　　　d) None of these

　　3) A _____ is one in which knowledge is specified, but the use to
　　　　which that knowledge is to be put is not given.

　　　　a) Inferential representation　　b) Declarative representation

　　　　c) procedural representation　　d) None of these

　　4) The conjunction connective of the form "m conjunction n" can be declared
　　　　as _____

　　　　a) m → n　　　　　　　　b) m ∧ n

　　　　c) m ∨ n　　　　　　　　d) m → >n

　　5) A _____ is a measure of the extent to which the evidence that
　　　　is described by the antecedent of the rule supports the conclusion.

　　　　a) set of propositions　　　　b) membership function

　　　　c) certainty factor　　　　　d) hill climbing

P.T.O.

6) _____ is the study of how to make computers do things which at the moment, people do better.

   a) Information Technology   b) Robotics

   c) Artificial Intelligence   d) Natural Language Processing

7) In conceptual dependency; the set of primitive acts for "transfer of physical location of an object" can be declared as _____

   a) MTRANs   b) PTRANs

   c) MBUILD   d) ATRANs

8) A _____ is a collection of attributes and associated values that describe some entity in the world.

   a) Frames   b) Script

   c) Semantic net   d) None of these

9) Natural language processing is divided into the two subfields of _____

   a) time and motion

   b) algorithm and heuristic

   c) understanding and generation

   d) none of these

10) A _____ interviews a domain expert to elucidate expert knowledge, which is then translated rules.

   a) software engineer   b) computer user

   c) hardware engineer   d) knowledge engineer

B) State **True** or **False** :   **4**

1) Natural language processing considers all moves from the current state and selects the best one as the next step.

2) Representational adequacy is the ability to represent all of the kind of knowledge that are needed in that domain.

3) Syntactic processing is also called passing.

4) Generate and test is also known as gradient search.

2. A) Write short notes on the following :   **8**

   i) Formal tasks

   ii) Semantic net.

B) Answer the following :   **6**

   i) Discuss generate and test algorithm.

   ii) What do you mean by fuzzy logic ?

3. Answer the following : **14**

   A) Illustrate how production system will be useful in order to solve a problem ?

   B) Define Heuristics. State the limitation of hill climbing.

4. Answer the following : **14**

   A) State and explain various approaches to the knowledge representation.

   B) Explain in detail the conceptual dependency as a strong slot and filler structure.

5. Answer the following : **14**

   A) Discuss the various steps in natural language processing.

   B) Explain constraint satisfaction with example.

6. Answer the following : **14**

   A) Discuss alpha-beta out offs with example.

   B) Differentiate between forward versus backward reasoning.

7. Answer the following : **14**

   A) Discuss expert system and expert system shell in detail.

   B) Explain in detail computable functions and resolution using predicate logic.

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Seat No.

M.Sc. (Part – II) (Semester – III) Examination, 2015
COMPUTER SCIENCE
Paper – XI : Mobile Computing

Day and Date : Monday, 20-4-2015　　　　　　　　　　　　Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
　　　　　　　　2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives : 　　　　　　　　　　　　　　　　　　**10**

　　 i) If mounted on the roof of a car, the length of _____ is efficient. This is also known as Marconi antenna.
　　　　a) $\lambda/2$ 　　　　　　　　　　　b) $\lambda/4$
　　　　c) $\lambda/6$ 　　　　　　　　　　　d) $\lambda/8$

　　 ii) In Phase Shift Keying (PSK), to receive signals correctly, the receiver must synchronize in Frequency and phase with the transmitter. This can be done using a _____
　　　　a) Quadrature PSK 　　　　　　b) Band pass filters
　　　　c) Rake receiver 　　　　　　　d) Phase lock loop

　　 iii) Which of the following is not the basis for SDMA algorithm ?
　　　　a) Cells 　　　　　　　　　　　b) Sectorized antennas
　　　　c) Space Division multiplexing 　d) Space Division Duplex

　　 iv) GSM contains special functions for voice such as _____ , which transmits voice data only when there is a voice signal.
　　　　a) Forward Error Correction (FEC)
　　　　b) Voice Acceleration Control (VAC)
　　　　c) Comfort noise
　　　　d) Voice Activity Detection (VAD)

　　 v) Signalling System No. 7 (SS7) is used for signaling between _____
　　　　a) BSC and MSC 　　　　　　　b) BTS and BSC
　　　　c) MSC to MSC 　　　　　　　　d) MS and BTS

vi) In IEEE 802.11 wireless LAN, _____ sub layer handles modulation and encoding/decoding of signal.
   a) PLCP
   b) PWD
   c) CCA
   d) PHY Management

vii) Which of the following is not function of MAC management protocol ?
   a) Management Information Base
   b) Roaming
   c) Provide carrier sense signal
   d) Support association and re-association of stations

viii) Which of the following is the possibility of location of COA ?
   a) Home Agent COA
   b) Foreign Agent COA
   c) Correspondent COA
   d) Internet

ix) In Transaction-oriented TCP, for transmission of only one packet, it may need _____ packets altogether.
   a) 3
   b) 5
   c) 7
   d) 9

x) MAC sub layer is the part of _____
   a) Physical Layer
   b) Data link layer
   c) Logical link control
   d) Access control mechanism

B) State **true/false** 4

i) Real antennas are isotropic radiators.

ii) An example of implicit reservation is DAMA.

iii) 2.4 GHz ISM is license free band.

iv) All active devices in piconet assigned a 48-bit address.

2. A) Write short notes on the following : (4+4)

i) Reservation TDMA.

ii) Roaming.

B) Answer the following : (3+3)

i) Explain Transmission/Time-out freezing.

ii) Explain Authentication in GSM.

3. Answer the following : **(7+7)**

   A) What are the disadvantages of using small cells in cellular system ? Explain different channel Allocation schemes in cellular system.

   B) Explain the client initialization mechanism in dynamic host configuration protocol.

4. Answer the following : **(7+7)**

   A) What is the problem of hidden and exposed terminals ? Explain how MACA protocol is used to solve it.

   B) What is handover ? Why it is essential ? Explain different types of handovers with the help of diagram.

5. Answer the following : **(7+7)**

   A) Draw and explain the format of an IEEE 802.11 PHY frame format using direct sequence spread spectrum.

   B) Explain indirect TCP and snooping TCP in detail.

6. Answer the following : **(7+7)**

   A) Explain different components and entities involved in the network and switching sub-system and operating sub-system of GSM.

   B) Explain the synchronization beacon transmission in IEEE 802.11 infrastructure network and Ad-hoc network.

7. Answer the following : **(7+7)**

   A) What do you mean by spread spectrum ? Explain its significance as resistance to narrowband interference using the diagrams for spreading and de-spreading of signal.

   B) Explain the congestion control, slow start and fast recovery mechanism in traditional TCP.

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Seat No.

M.Sc. (Part – II) (Semester – III) Examination, 2015
COMPUTER SCIENCE (Paper – XII)
Modeling and Simulation

Day and Date : Wednesday, 22-4-2015   Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt any **three** questions from Q. **3** to Q. **7**.
3) Figures to **right** indicate **full** marks.

1. A) Select the correct alternative.   **10**

   i) The slack for an activity in network is equal to

      a) LS-ES   b) LF-LS   c) EF-ES   d) EF-LS

   ii) If small orders are placed frequently, then total inventory cost is

      a) Reduced   b) Increased

      c) Either reduced nor increased   d) Minimized

   iii) Simulation is

      a) Descriptive in nature

      b) Useful to analyze problem where analytical solution is difficult

      c) A statistical experiments as such as its results are subject to statistical errors

      d) All of the above

   iv) Repetition of n independent Bernoulli trails reduced to

      a) Poisson distribution   b) Binomial distribution

      c) Geometric distribution   d) Hypergeometric distribution

   v) Simulation of system in which the state changes smoothly with time are called _____

      a) Continuous system   b) Discrete system

      c) Deterministic system   d) Probabilistic system

vi) The activity which can be delayed without affecting the execution of immediate succeeding activity is determined by
   a) Total float   b) Free float
   c) Independent float   d) None of these

vii) In M/M/1 : ∞/FCFS queue model if λ is mean customer arrival rate and μ is the mean service rate then the probability of server being busy is equal to

   a) $\dfrac{\lambda}{\mu}$ b) $\dfrac{\lambda}{\mu - \lambda}$ c) $\dfrac{\mu}{\mu - \lambda}$ d) $\dfrac{\mu}{\lambda}$

viii) Markov chain said to be ergodic chain if _____ of whose states are ergodic.
   a) One   b) Some   c) All   d) None

ix) In queue model completely specified in the symbolic form (a/b/c/) : (d/e), the last symbol 'e' specifies
   a) The queue discipline   b) The number of servers
   c) The distribution of arrival   d) The distribution of departure

x) If customer, on arriving at the service system stays in the system until served, no matter how he has to wait for service is called _____ customer.
   a) a regular   b) an irregular   c) a patient   d) an impatient

B) Fill in the blanks.   **4**

  i) In EOQ problem, minimum total cost occurs at a point where the ordering cost and _____ cost are equal.

  ii) The long form of CPM is _____.

  iii) Chapman-Kolmogorov equation is $P_{ij}(t + T) =$ _____.

  iv) In inventory model, the number of unit required per period is called _____.

2. A) i) A customer arrive in a certain store according to Poisson process with rate $\lambda = 4$ per hour, given that the store opens at 9.00 am, then what is probability that exactly one customer has arrive by 9.30 am ?   **3**
  ii) What do you mean by movement inventories ?   **3**

 B) i) State and prove the Chapman-Kolmogorov equation.   **4**
  ii) Write note on simulation.   **4**

3. A) Differentiate between PERT and CPM. **7**

   B) Explain the generation of random sample from continuous uniform distribution. **7**

4. A) Explain the concept of inventory control. Write any four reasons for carrying inventories. **7**

   B) The demand rate for a particular item is 12000 units/ year. The ordering cost of Rs. 1,000 per order and the holding cost is Rs. 0.80 per month. If no shortage are allowed and the replacement is instantaneous the determine **7**
      i) Economic order quantity
      ii) Number of order per year.

5. A) For various activity in the particular project the expected time (in days) of completions are as follow. **7**

Activity	0 –1	1 – 3	1 – 2	2 – 3	1 – 4	3 – 4	4 – 5
Duration	3	16	6	8	10	5	3

   Draw a network diagram and identify the critical path.

   B) Write steps in of Monte-Carlo simulation technique. **7**

6. A) Generate the five successive random number X_i, i = 1, 2, 3, 4, 5 by using $X_{i+1} = X_i{}^*a$ (modulo m), starting with seed $X_0 = 3$ and parameters a = 7 and m = 15 (where m means that the number $\{X_i{}^*a\}$ is divided by m repeatedly till the reminder is less than m). **7**

   B) Define project duration, earliest event time, earliest start time, latest start time, and earliest finish time in critical path computation. **7**

7. A) Define simulation. Write the advantages and limitations of simulation. **7**

   B) Explain pure birth process. **7**

M.Sc. (Part – II) (Semester – IV) Examination, 2015
COMPUTER SCIENCE (Paper – XIII)
Distributed Operating Systems

Day and Date : Thursday, 16-4-2015　　　　　　　　　Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions :　I) Q. **1** and Q. **2** are **compulsory** questions.
　　　　　　　　II) Attempt **any three** questions from Q. **3** to Q. **7**.
　　　　　　　　III) Figures to **right** indicate **full** marks.

1. A) Choose the correct alternative :　　　　　　　　　　　　　**10**

　　1) A _____ is a standard rules that govern the format, contents
　　　and meaning of the messages sent and received.

　　　a) Session semantics　　　　　b) Protocols

　　　c) Application Software　　　　d) Pipes

　　2) Packing parameters into a message is called _____

　　　a) Message Packing　　　　　b) Parameter Passing

　　　c) Message Formatting　　　　d) Parameter Marshalling

　　3) The _____ property ensures that each transaction either
　　　happens completely or not at all.

　　　a) Isolated　　　b) Consistent　　c) Atomic　　　　d) Durable

　　4) The thread is created spontaneously to handle an incoming RPC is referred
　　　to as a _____

　　　a) Parent thread　　　　　　b) Push-down thread

　　　c) RPC thread　　　　　　　d) Pop-up thread

　　5) If the workstations are _____, the file system must be
　　　implemented by one or more remote file servers.

　　　a) Diskless　　　　　　　　b) Idle workstation

　　　c) Disk full　　　　　　　　d) Multiprocessor

P.T.O.

6) When a process is created to be once placed on machine, the process stays there until it terminates; such an allocation is called as _____

    a) Migratory allocation   b) Replication allocation

    c) Non-migratory allocation   d) Flexibility allocation

7) The _____ schemes associate with each file a list of users who may have right to use file and how ?

    a) Capability   b) Access control list

    c) Upload model   d) Data server

8) The _____ allows dozens, or even hundreds, of machines within a building to be connected in such way that amounts of information can be transferred between machines in a millisecond.

    a) Wide Area Networks

    b) Landscape Area Networks

    c) Infrastructure Public Networks

    d) Local Area Networks

9) Using _____ transparency, the system is free to make additional copies of files and other resources on its own without the users noticing.

    a) Concurrent   b) Copying

    c) Replication   d) Remote to File Access

10) A _____ is a situation in which at least one resource must be held in a non-sharable mode; that is, only one process at a time can use the resource.

    a) Resource Sharing   b) Mutual exclusion

    c) Clock synchronization   d) Process Election

B) State **True/False** :   **4**

1) If send is blocking it returns control to the caller immediately, before the message is sent.

2) When a packet containing a certain address is sent that to be delivered to all machines then such a technique is called multicasting addressing.

3) A single thread model to construct server can be characterized with no parallelism and having blocking system calls.

4) Protection refers to a mechanism for controlling the access of programs, processes or users to the resources defined by computer systems.

2. A) Write a short note : **8**
    i) Data Link Layer
    ii) Berkeley Algorithm.

   B) Answer the following : **6**
    i) What do you mean by Peer and Hierarchical group ?
    ii) Define the term virtual memory.

3. Answer the following :

   A) Differentiate between MS-windows NT and Novel Netware. **7**

   B) What do you mean by File Server ? Describe in detail the Remote Access
      Model and Upload/Download model. **7**

4. Answer the following :

   A) Enlist the System Model. State and Explain in detail the Processor Pool Model. **7**

   B) Define Remote Procedure Call. Discuss in detail mechanism involved for
      sending calls and messages as Remote Procedure call. **7**

5. Answer the following :

   A) Define Threads. Discuss in detail three organizations of threads in a process
      as a part of Thread usage. **7**

   B) Define the term Clock Synchronization. Discuss Centralized algorithm for
      Mutual Exclusion. **7**

6. Answer the following :

   A) Define the term Distributed Operating Systems. Discuss in detail its advantages
      and Disadvantages. **7**

   B) Define term Deadlock. Explain in detail Centralized and Distributed Deadlock
      Detection algorithm. **7**

7. Answer the following :

   A) Define the term Logical Clocks. Discuss in detail Lamport's Algorithm for the
      clock correction. **7**

   B) What do you mean by Election Algorithm ? Explain in detail Bully Election
      Algorithm. **7**

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Seat No.

M.Sc. – II (Semester – IV) (Computer Science) Examination, 2015
DATA MINING AND WAREHOUSE (Paper – XIV)

Day and Date : Saturday, 18-4-2015

Total Marks : 70

Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. 1 and *2* are **compulsory**.
2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives : **10**

 1) Which of the following features usually applies to data in a data warehouse ?

  a) Data are often deleted

  b) Most applications consist of transactions

  c) Data are rarely deleted

  d) Relatively few records are processed by applications

 2) Which of the following schema contains multiple fact tables ?

  a) Star   b) Snowflake

  c) Fact constellation   d) None of the above

 3) The basic algorithm for decision tree induction is a _____ algorithm.

  a) Step-Step   b) Procedural

  c) Greedy   d) None of the above

 4) The priori algorithm operates in a bottom up and _____ method.

  a) First Search   b) Depth Search

  c) Breadth Search   d) Unidirectional Search

 5) Data mining is used to aid in

  a) operational management

  b) analyzing past decision made by managers

  c) detecting patterns in operational data

  d) retrieving archival data

6) A star schema has what type of relationship between a dimension and fact table ?

    a) Many-to-many   b) One-to-one

    c) One-to-many   d) All of the above

7) Transient data is

    a) Data in which changes to existing records cause the previous version of the records to be eliminated

    b) Data in which changes to existing records do not cause the previous version of the records to be eliminated

    c) Data that are never altered or deleted once they have been added

    d) Data that are never deleted once they have been added

8) The generic two-level data warehouse architecture includes which of the following ?

    a) At least one data mart

    b) Data that can extracted from numerous internal and external sources

    c) Near real-time updates

    d) All of the above

9) Classification accuracy is

    a) A subdivision of a set into number of classes

    b) Measure of the accuracy, of the classification of a concept that is given by theory

    c) The task of assigning a classification to set

    d) None of the above

10) _____ which converts data from legacy or host format to warehouse format.

    a) Data transformation   b) Data cleaning

    c) Data extraction   d) Load data

B) Fill in the blanks :   **4**

1) A _____ is a set of views over operational databases.

2) The roll-up operation is also called _____

3) _____ means that, once entered into the warehouse, data should not change.

4) 1 terabyte (T/TB) = 2 ^ _____ bytes.

2. A) Write short notes on the following : **8**

   i) Data mining primitives

   ii) Data reduction.

  B) Answer the following : **6**

   i) Write the preprocessing steps that may be applied to the data for classification and prediction.

   ii) What is data integration ? Explain issues to consider during data integration.

3. Answer the following :

  A) Explain the various data mining applications. **7**

  B) State and explain the steps in back propagation algorithm. **7**

4. Answer the following :

  A) Describe data warehouse architecture with well labeled diagram. **8**

  B) What are metadata ? Explain metadata repository. **6**

5. Answer the following :

  A) What is cluster analysis ? Explain agglomerative and divisive hierarchical clustering. **8**

  B) What is meant by multi level association rule ? Discuss any two approaches for mining multi-level association rules with examples. **6**

6. Answer the following :

  A) What are Bayesian classifiers ? Explain Naïve Bayesian classifier. **7**

  B) Describe the k-medoid algorithm. **7**

7. Answer the following :

  A) Explain OLAP operations in the multidimensional data model. **7**

  B) Explain new trends in data mining. **7**

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Seat No.

M.Sc. – II (Semester – IV) (Computer Science) Examination, 2015
DIGITAL IMAGE PROCESSING (Paper – XV)

Day and Date : Tuesday, 21-4-2015   Max. Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Question No. **1** and **2** are **compulsory**.
2) Attempt **any 3** questions from Q. No. **3** to Q. No. **7**.
3) Figures to the **right** indicate **full** marks.

1. A) Choose correct alternatives.   **10**

   1) Computerized axial tomography works based on
      a) Gamma rays   b) X-rays
      c) Ultra violet rays   d) Infra red rays

   2) An image of size 20×10 pixels formed with 64 gray levels need _____
      bytes of storage space.
      a) 12800   b) 1600   c) 1200   d) 150

   3) The D_8 distance between (10, 5) and (6, 8) is _____
      a) 7   b) 4   c) 5   d) 1

   4) Median filter yields good result for _____
      a) Gaussian noise   b) Uniform noise
      c) Impulse noise   d) Exponential noise

   5) Which of the following statement is false for the Fourier transformed image ?
      a) Average gray level of input image is found at origin of transformed
         image
      b) Symmetric filters are used for filtering in frequency domain
      c) To extract edges high pass filter is used
      d) Frequency domain filters are better for noise removal as compared to
         spatial domain filters

P.T.O.

6) The adaptive, local noise reduction filter is given by $\hat{f}(x, y) = $ _____

    a) $g(x, y) - \dfrac{\sigma_L^2}{\sigma_n^2}[g(x, y) - m_L]$ b) $g(x, y) - \dfrac{\sigma_n^2}{\sigma_L^2}[g(x, y) - m_L]$

    c) $g(x, y) - \dfrac{\sigma_L^2}{\sigma_n^2}[m_L - g(x, y)]$ d) $g(x, y) - \dfrac{\sigma_n^2}{\sigma_L^2}[m_L - g(x, y)]$

7) Morphological hit-or-miss transform is a tool for _____
    a) Object detection   b) Shape detection
    c) Size detection   d) Orientation detection

8) Thresholding is used to segment an image into _____
    a) Two regions only   b) Three regions only
    c) Two or three regions   d) Any number of regions

9) The four directional chain code of an object is 0003232121. Its shape number is _____
    a) 0003313313   b) 0003133133
    c) 0033133131   d) 0033133133

10) If two objects are similar then the measure of similarity between these two objects is _____
    a) 0   b) 1   c) very large value   d) Infinity

B) Fill in the blanks :   **4**

    1) The $N_D(p)$ of a pixel $p(x, y)$ are given by _____

    2) Second order derivative of a ramp edge region is _____

    3) Gaussian band reject filter is given by _____

    4) A region contains 5 faces, 3 holes, 4 vertices and 2 connected components. The total edges are _____

2. A) Write short notes on the following :   **8**

    i) Expression of one dimensional Fourier transform in polar coordinate system.

    ii) Give PDF of Rayleigh noise and its uses.

B) Answer the following : **6**

   i) Find the shortest digital path between P and Q using m-adjacency.

1	0	0	1	1	0	1
1	1	0	0	1	1	0
0	1	1	1	0	1	Q
0	1	0	0	1	1	0
1	1	0	1	1	0	1
1	0	1	1	0	1	0
P	1	0	1	0	0	1

   ii) Use the specific primitives a, b, c and d given as ↘ , ↗ , → and ↓ respectively and build the following structure :

3. Answer the following : **14**

   A) Explain the process of digitizing the intensity and coordinate values of an image.

   B) Perform closing of following structure using a circle of 1 cm radius :

4. Answer the following : **14**

   A) What is the role of histogram in contrast stretching ? Discuss.

   B) Fill the following region using morphological region filling algorithm.
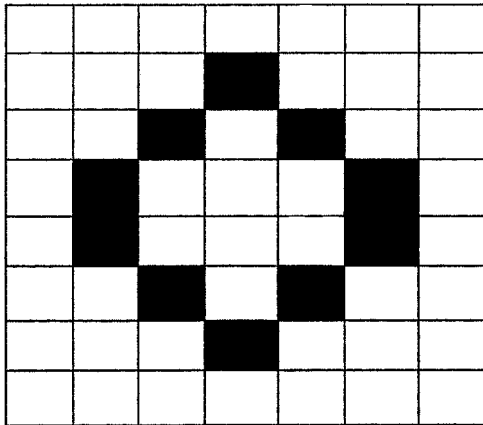
5. Answer the following : **14**

   A) Describe smoothing frequency domain filters. Also give their comparison.

   B) Compute the covariance matrix for the following vectors :

   $(1, 1, 0, 0)^T$, $(1, 0, 1, 1)^T$, $(0, 1, 1, 0)^T$ and $(1, 0, 0, 1)^T$.

6. Answer the following : **14**

   A) Derive illumination and reflectance functions using Homomorphic filtering.

   B) The two classes of objects denoted by ω_1 and ω_2 have sample mean vectors $m_1 = (4, 9, 5)$ and $m_2 = (1, 6, 2)$ respectively. Compute decision boundary between these two objects.

7. Answer the following : **14**

   A) Write algorithm for basic global thresholding.

   B) Compute the distances between following objects and find out which of them are nearest :

(a)   (b)   (c)   (d)
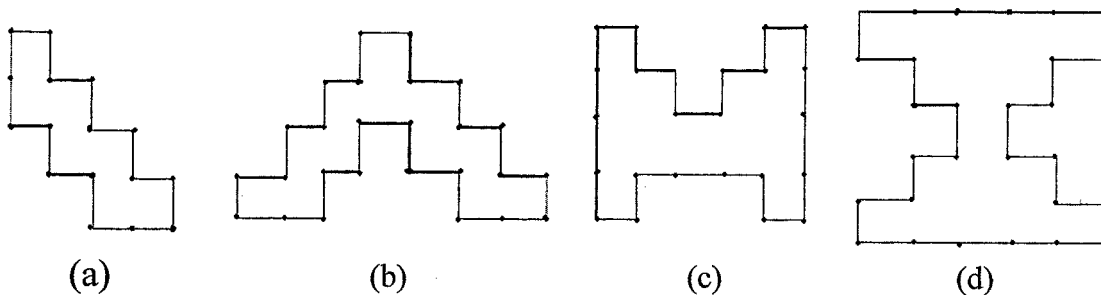
Seat No.

M.Sc. – II (Semester – IV) Examination, 2015
COMPUTER SCIENCE
.Net (Paper – XVI)

Day and Date : Thursday, 23-4-2015　　　　　　　　　　　Total Marks : 70
Time : 3.00 p.m. to 6.00 p.m.

Instructions : 1) Q. **1** and Q. **2** are **compulsory**.
　　　　　　　　2) Attempt **any 3** questions from Q. **3** to Q. **7**.
　　　　　　　　3) Figures to the **right** indicate **full** marks.

1. a) Choose the correct alternative : **10**

　　1) Which of the following statement is correct about a namespace ?
　　　　a) System is not a root namespace
　　　　b) Nested namespaces are not allowed
　　　　c) Nested namespaces are allowed
　　　　d) Windows is a root namespace

　　2) Which of the following control is always read-only ?
　　　　a) TextBox　　　b) Label　　　c) ComboBox　　d) RichTextBox

　　3) Central to the .Net framework is the runtime execution environment known as _____
　　　　a) JIT　　　　　b) CTS　　　　c) CLR　　　　　d) CLS

　　4) _____ property checked to know that is the page posted back.
　　　　a) PostBack　　b) Post　　　　c) BackPost　　d) IsPostBack

　　5) The scope of a variable refers to _____
　　　　a) the length of the variable　　　b) the name of the variable
　　　　c) the accessibility of the variable　d) the data type of the variable

　　6) _____ are used to implement event handling mechanism.
　　　　a) Indexers　　　　　　　　　b) Delegates
　　　　c) Properties　　　　　　　　d) All of these

P.T.O.

7) _____ is the folder that contains web applications in a web server.

   a) Root Folder   b) Web Folder

   c) Virtual Folder   d) Program Folder

8) The _____ directive is the instructions for the page and continues with the various attributes available to this directive.

   a) @Page   b) @Cache

   c) @Response   d) @Control

9) The _____ control has a in-built support for Sort, Filter and paging the data.

   a) FormView   b) ListView

   c) TabView   d) GridView

10) The _____ provides set of types that are used by all .NET languages and ensures .NET language type compatibility.

   a) Common Type System

   b) Common Language Type

   c) Common Type Language

   d) Common System Type

b) State whether **true** or **false** :   **4**

   1) The files with .aspx extension are global applications.

   2) The runat="server" attribute is mandatory for the Server Controls.

   3) The RequiredFieldValidator control allows comparing a value entered into a field against another field.

   4) The DataSet can contain multiple tables.

2. a) Write short note on :   **8**

   1) Reflection

   2) Different Services provided by CLR.

b) Answer the following :   **6**

   1) Differentiate between DataReader and DataAdapter.

   2) Give the advantages of ASP.Net.

3. Answer the following :

   a) Explain any three web server controls. **7**

   b) Explain ASP.Net page directives. **7**

4. Answer the following :

   a) Explain the steps to use a delegate with example. **7**

   b) Explain server-side state management in detail. **7**

5. Answer the following :

   a) Describe in brief .Net framework and its components. **7**

   b) Define polymorphism. How do we achieve polymorphism in C# ? **7**

6. Answer the following :

   a) Design web application for book information and write ADO.Net code for saving records and searching a specific book. **7**

   b) What are namespaces ? List and explain the purpose of at least three namespaces. **7**

7. Answer the following :

   a) Define Event. Describe how to implement of an event with example. **7**

   b) Explain web form events available in ASP.Net. **7**

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