SLR-MM – 204

Seat No.	

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

Day and Date : Monday, 16-11-2015 Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

Instructions *: 1) Q.* ***1*** *and Q.* ***2*** *are* ***compulsory****.*

2) Attempt ***any three*** *from Q.* ***3*** *to Q.* ***7****.*

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

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

1) How we can access data members using objects ?

A) Object@datamember B) Object*datamember

C) Object.datamember D) Object->datamember

2) Which of the following is not a type of constructor ?

A) Copy constructor B) Friend constructor

C) Default constructor D) Parameterized constructor

3) Which of the following concepts is used to implement late binding ?

A) Virtual function B) Operator function

C) Const. function D) Static function

4) Which of the following problem causes an exception ?

A) Missing semicolon in statement in main ()

B) A problem in calling function

C) A syntax error

D) A run-time error

P.T.O.

5) Which of the following is correct about class and structure ?

A) Class can have member functions while structure cannot

B) Class data members are public by default while that of structure are private

C) Pointer to structure or classes cannot be declared

D) Class data members are private by default while that of structure are public by default

6) Which of the following functions are performed by a constructor ?

A) Construct a new class B) Initialize objects

C) Construct a new function D) Construct a new object

7) Which of the following operators cannot be overloaded ?

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

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

A) Class B) Member functions

C) Constructor D) Destructor

9) I) All operators can be overloaded in C++.

II) We can change the basic mening of an operator in C++.

A) Only I is true B) Both I and II are false

C) Only II is true D) Both I and II are true

10) Which of the following is not a type of inheritance ?

A) Multiple B) Multilevel

C) Distributive D) Hierarchical

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

1) A constructor has the different name as that of a class.

2) A class can inherit properties from more than one class which is known as multilevel inheritance.

3) A static function can have access to only other static member (functions or variables) declared in the same class.

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

2. A) Attempt the following questions : **8**

   i) What are the basic concepts of OOPs ? Explain in short.

   ii) What do you mean by function prototyping ? Explain with example.

   B) Write a short note on following : **6**

   i) Structure and class

   ii) Algorithm.

3. Attempt the following questions : **14**

   A) What is difference between call by reference and return by reference ? Explain with suitable example.

   B) What is constructor ? Explain copy constructor with example.

4. Attempt the following questions : **14**

   A) What is operator overloading ? Explain the syntax for overloading operator with example.

   B) Write a C++ program to implement multiple constructor.

5. Attempt the following questions : **14**

   A) What is inheritance ? Explain different types of inheritances with syntax and example.

   B) Write a program in C++ to demonstrate the use of class and object.

6. Attempt the following questions : **14**

   A) What is Template ? Explain class template with syntax and example.

   B) Write a C++ program to create the class shape, and overload the function to return the perimeters of the different shapes.

   (e.g. Triangle P = s1 + s2 + s3, Square P = 4*b, Rectangle P = 2*l + 2*W)

7. Attempt the following questions : **14**

   A) What is manipulator ? Explain width (), precision (), and fill () manipulators with example.

   B) Explain the use of dynamic memory allocation operators new and delete with example.

SLR-MM – 205

Seat No.	

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

Day and Date : Wednesday, 18-11-2015 Max. Marks : 70

Time : 10.30 a.m. to 1.00 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 number 0.08805×10^3 has _____ significant digits.

a) 3 b) 4 c) 5 d) 6

ii) The truncation error in calculating $f'(2)$ for $f(x) = x^2$ by $f'(x) \approx \frac{f(x+h) - f(x)}{h}$ with $h = 0.1$ is

a) -0.2 b) -0.1 c) 4 d) 4.2

iii) 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

iv) The goal of forward elimination steps in the Gauss elimination method is to reduce the coefficient matrix to _____ matrix.

a) a diagonal
b) an identity
c) a lower triangular
d) an upper triangular

P.T.O.

v) The secant method of finding roots of nonlinear equations falls under the category of _____ methods.

a) bracketing b) graphical

c) open d) random

vi) Given $A = \begin{bmatrix} 6 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 6 \end{bmatrix}$ Then A is _____ matrix.

a) a diagonal b) an identity

c) an upper triangular d) a lower triangular

vii) The number of different polynomials that can go through two fixed data points (x_1, y_1) and (x_2, y_2) is

a) 0 b) 1 c) 2 d) infinite

viii) In composite Trapezoidal rule the number of segments n must be

a) multiple of 3 b) an odd number

c) an even number d) any positive integer

ix) The degree of a differential equation is the power of the _____ derivative.

a) lowest order b) highest order

c) first order d) second order

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

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

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

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

i) If there is two or more independent variables, then the differential equation is called partial differential equation.

ii) The second phase of Gauss elimination method is forward substitution phase.

iii) If $y_0 = 1$, $y_1 = 2$ and $y_2 = 4$ then $\Delta^2 y_0 = 2$.

iv) In Newton-Raphson method complications will arise if the $f'(x_n)$ or $f'(x_i)$ is zero or close to zero.

2. A) i) Define an absolute error.
   Given $x = 10.00 \pm 0.05$ and $y = 0.0556 \pm 0.0002$
   Find the maximum value of the absolute error in $2x + y$. **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) Write a note on Euler's method. **7**
   B) Given that the equation $x^{2.2} = 69$ has a root between 5 and 8. Use the method of Regula-Falsi to determine it correct to four decimal places. **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) Explain Simpson's 3/8 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) Write a note on errors in polynomial interpolation. **7**
   B) Use Trapezoidal rule with n = 6 to estimate

$$\int_0^1 \frac{dx}{1+x^2}$$

   correct to five decimal places. **7**

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SLR-MM – 206

Seat No.	

M.Sc. – I (Semester – I) Examination, 2015
(New CBCS)
COMPUTER SCIENCE (Paper – III)
Software Engineering

Day and Date : Friday, 20-11-2015 Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

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

1) Software engineering
   a) Is a set of rules developing software products
   b) Has been around as a discipline since the early 50's
   c) Is an engineering discipline concerning with all the aspects of software production
   d) Is now a mature discipline on par with other established engineering fields

2) During _____ phase the requirements analysis is performed.
   a) System design b) System development
   c) System analysis d) System investigation

3) A graphic representation of information system is called
   a) Data flow diagram b) Flow chart
   c) Pictogram d) Graph

4) A _____ is a person who writes a program for running the hardware of computer.
   a) System Analyst b) System Designer
   c) Data Processor d) Programmer

P.T.O.

5) Which of the following is not considered a tool at system design phase ?
   a) Data flow diagram b) Decision table
   c) Pie chart d) System flow chart
6) Coding and testing is done in _____ manner.
   a) Adhoc b) Cross sectional
   c) Bottom-up d) Top-down
7) _____ is not a component of object oriented software engineering.
   a) Process b) Architecture c) Method d) None of these
8) Prototype is a
   a) Working model of existing system
   b) Mini model of existing system
   c) Mini model of processed system
   d) None of the above
9) Which of the following is a function of the process step of data processing ?
   a) Index b) Update c) Protect d) Retrieval
10) _____ software category belongs to knowledge based systems.
   a) System software b) Real time software
   c) Embedded software d) Artificial intelligence software

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

1) The testing of software against SRS is called regression testing.
2) Preparation of various stages of development in software project management is called sliding window concept.
3) "We already have a book that's full of standards and procedures for building software, won't that provide my people with everything that need to know" – it's a customer myth.
4) Process defines a framework for a set of key process areas that must be established for effective delivery of software engineering technology.

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

   A) Budget overrun.
   B) Software engineering.

B) Answer the following : **6**

a) What is system modeling ?
b) What are the benefits of prototyping ?

3. Answer the following :
   A) Consider your own project and explain the following phases. **7**
      i) Requirement Gathering.
      ii) Analysis.
      iii) Design.
   B) Why black box testing is essential in software engineering ? **7**

4. Answer the following :
   A) What is software Design ? Explain various concepts of Design. **7**
   B) Explain Generic view of software in detail. **7**

5. Answer the following :
   A) Draw neat and labelled diagram of spiral model and explain each phase in detail. **7**
   B) How basis path testing is done ? Explain. **7**

6. Answer the following :
   A) Discuss the software myths. **7**
   B) Explain briefly about Architectural Design Optimization. **7**

7. Answer the following :
   A) Explain data modeling concepts. **7**
   B) Explain the principles that guide the design of effective user interfaces. **7**

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SLR-MM – 207

Seat No.	

M.Sc. (Part – I) (Semester – I) (New CBCS) Examination, 2015
COMPUTER SCIENCE (Paper – IV)
Data Structures

Day and Date : Monday, 23-11-2015 Max. Marks : 70
Time : 10.30 a.m. to 1.00 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) Two main measures for the efficiency of an algorithm are
   a) Processor and memory b) Complexity and capacity
   c) Time and space d) Data and space

2) The operation that does process and visit each and every element of data structure at least once is
   a) Sorting b) Merging
   c) Inserting d) Traversing

3) Two dimensional arrays are also called
   a) tables arrays b) matrix arrays
   c) both of above d) none of above

4) 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) Houseful c) Overflow d) Saturated

5) Merge sort uses
   a) Greedy approach b) Backtracking approach
   c) Divide and Conquer Strategy d) Linear search

P.T.O.

6) A _____ data structure allows inserting and deleting an element from only one end.

a) tree b) linked list c) stack d) queue

7) Dijkstra's shortest path algorithm is _____ in the sense that it always chooses the closest vertex to the source among those whose shortest path is not yet known.

a) Dynamic programming b) Shortest tree

c) Branch and Bound d) Greedy

8) The _____ operation is used to join the two different strings into one complete string.

a) String Combine b) String Joining

c) String Concatenate d) String Mixing

9) The difference between the height of the right sub tree and the height of the left sub tree is termed as the

a) Strength factor b) Balancing factor

c) Adjunct factor d) Binary tree factor

10) ASCII stands for

a) American Standardization Coding for Internet Information

b) African Standard Code of Information Interchange

c) Asian Standard Code for Information Exchange

d) American Standard Code for Information Interchange

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

1) Null case does exist in the complexity theory.

2) Tree data structure consists of the first field of cells to hold atoms and second fields to hold pointers to the next cells on the list.

3) Queue data structure follows a principle of Last in First Out.

4) The filling-in of a table of sub problems to get a solution to a given problem has been termed dynamic programming, a name that comes from control theory.

2. A) Write a short notes : **8**
   i) Priority Queue
   ii) Circular Linked List.

   B) Answer the following : **6**
   i) What do you mean by Sparse Matrix ?
   ii) Define the term Data Structure.

3. Answer the following :
   A) Define the term Sorting. State and perform selection sort algorithm to sort following numbers in ascending order. **7**

   66, 35, 105, 13, 78, 55, 28, 86, 49, 65, 99, 23, 1, 81, 44

   B) What do you mean by tree ? Discuss the Depth and Breadth First Search algorithm for tree traversing with suitable example. **7**

4. Answer the following :
   A) Define the term Linked List. Discuss atom insertion and deletion operation at the beginning, middle and at the end using Doubly Linked List with suitable example. **7**

   B) Enlist the applications of Stack. Discuss a Tower of Hanoi Problem and its solution having three disks and three pegs. **7**

5. Answer the following :
   A) Define the term data type. Discuss in detail Primitive and Composite data type with suitable example. **7**

   B) What do you mean by Backtracking ? Discuss in detail mechanism of Backtracking with suitable example. **7**

6. Answer the following :
   A) Define the term Dequeue. Discuss insertion and deletion operation on Dequeue with suitable example. **7**

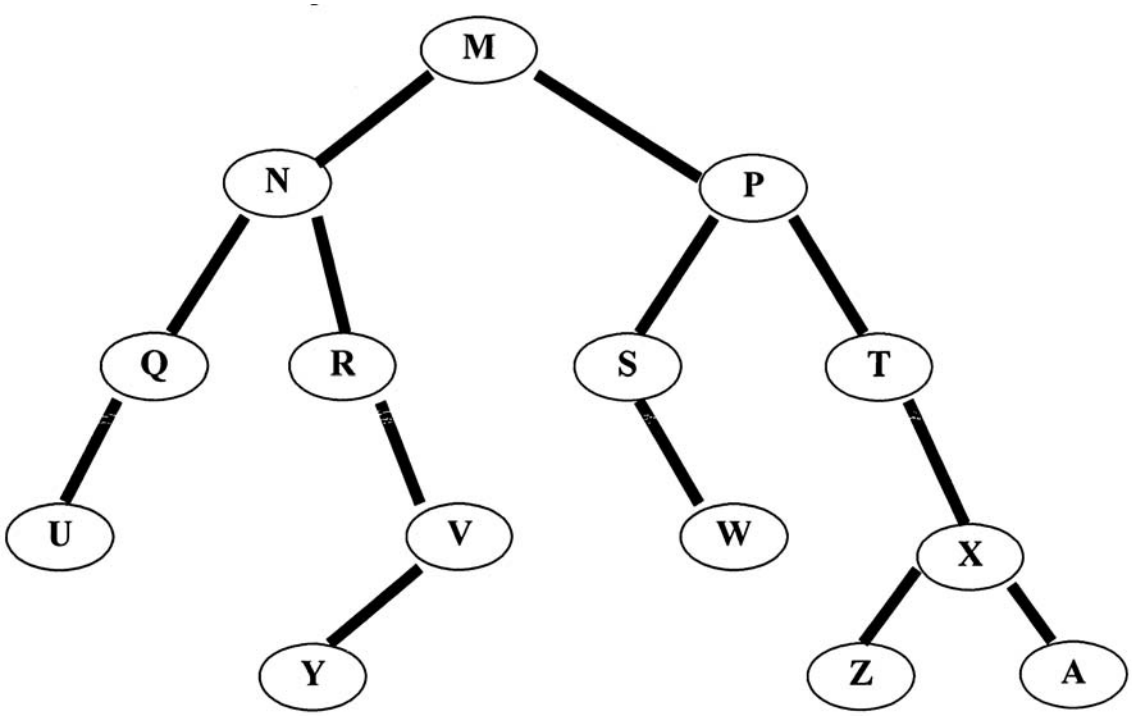
   B) Illustrate the algorithm for the conversion of infix arithmetic expression into postfix expression using stack on given expression **7**

   A * (B + C) – (M/N+R) + H * X.

7. Answer the following :

A) What do you mean by Array ? Discuss in detail array as a data structure with suitable example. **7**

B) Define the term Binary tree. Illustrate the process of Pre-Order, In-Order and Post-Order traversing. **7**



SLR-MM – 208

Seat No.	

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

Day and Date : Monday, 16-11-2015 Max. Marks : 70
Time : 10.30 a.m. to 1.00 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 count ?

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 multiple constructor with example. **7**

4. Answer the following :

   A) Write a program to implement Arrays of 5 Objects of class named 'STUDENT' which should include two member functions input ( ) and display ( ) to read the student details (Name, Roll_no, Marks) and display ( ) to display the details of these students. **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 different methods for opening the file. **7**

   B) Write a program to swap two number (integer and float numbers) by using Function overloading concept. **7**

SLR-MM – 209

Seat No.	

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

Day and Date : Wednesday, 18-11-2015 Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

Instructions : *i) Question Nos. **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) To apply Simpson's one third rule, the given interval must be divided into an _____ number of equal intervals.
a) Odd b) Even c) Countable d) Uncountable

ii) The system of equations $2x + 5y = 10$, $7x + y = 45$ has
a) No unique solution b) Only one solution
c) Only two solutions d) Infinite solutions

iii) Process of estimating the value of dependent variable of an intermediate value is called
a) Interpolation b) Extrapolation
c) Estimation d) Dependence

iv) The first approximation of a root of $x^3 + 3x - 1 = 0$ by Newton-Raphson method taking $x_0 = 0$ is
a) 0.3 b) 0.32 c) 0.33 d) 0.66

v) In Guass elimination method for solving a system of linear algebraic equations triangulization leads to
a) Diagonal matrix b) Lower triangular matrix
c) Singular matrix d) Upper Triangular matrix

vi) Simpsons one third rule is obtained by taking n = _____ in general quadrature formula.
a) 1 b) 2 c) 3 d) 4

vii) In which of the following methods proper choice of initial value is very important ?
a) Bisection method b) False position
c) Bairsto method d) Newton-Raphson

viii) The convergence in modified Euler's method is _____ than that of Euler's method.
a) Slower b) Compatible c) Faster d) One time more

ix) A root of the equation $x^3 - x - 11 = 0$ correct to four decimals using bisection method is
a) 2.4737 b) 2.3838 c) 2.3736 d) 3.0000

x) Errors may occurs in performing numerical computation on the computer due to
a) Rounding error b) Power fluctuation
c) Operator fatigue d) All of these

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

i) Bisection method is not convergent always.

ii) Simpson's rule is applicable for ordinary differential equations

iii) The Largest coefficient of x_i from all the n equations is called pivot.

iv) Eigen values of a matrix A are given by $|A - \lambda I| = 0$.

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

i) Forward and Backward differences

ii) Householder's method.

B) Answer the following : **6**

i) Prove the following identity

$$\delta^2 = \Delta - \nabla$$

ii) Write the error formula for Trapezoidal rule and Simpson's $\frac{1}{3}$rd rule.

3. A) Solve $xe^x - 3 = 0$ by Regula-Falsi method to obtain a root lying in the interval (1, 1, 1) correct to 3 places of decimal. **7**

   B) Explain the term absolute, relative and percentate error with suitable example. **7**

4. A) State and prove Legrange's interpolation formula. **7**

   B) Using Modified Euler's method find y at x = 0.2 given $\frac{dy}{dx} = 3x + \frac{1}{2}y$ with y(0) = 1 take h = 0.1. Perform three iterations at each step. **7**

5. A) Find the cubic polynomial which takes the following values. **7**

X	1	3	5	7
y = f(x)	24	120	336	725

   and obtain the value of y(8).

   B) Solve the following system using LU decomposition method. **7**

   $4x + 6y + 2z = 18$

   $2x + 4y + 6z = 12$

   $6x + 2y + 2z = 8$

6. A) Solve the following system of equation

   $6x + y + z = 20$

   $x + 4y - z = 6$

   $x - y + 5z = 7$

   By using Gauss Seidal method. Perform three iteration at each step. **7**

   B) Given $\frac{dy}{dx} = 1 + xy$, $y(0) = 1$ obtain the Taylor's series for y(x) and compute y(0.1) correct to four decimal. **7**

7. A) Find all the eigen values and eigen vectors of the following matrix. **7**

$$\begin{bmatrix} 10 & 0 & 2 \\ 0 & -4 & 0 \\ 2 & 0 & 10 \end{bmatrix}$$

   B) Solve $x^4 - x - 9 = 0$ by using Newton Raphson method (Perform 3 iterations). **7**

SLR-MM – 210

Seat No.	

M.Sc. (Part – I) (Semester – I) (Old CGPA) Examination, 2015
COMPUTER SCIENCE (Paper – III)
Software Engineering

Day and Date : Friday, 20-11-2015 Total Marks : 70
Time : 10.30 a.m. to 1.00 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) Software engineering primarily aims on
   a) Reliable software
   b) Cost effective software
   c) Reliable and cost effective software
   d) None of the above

2) Product is
   a) Deliverable
   b) User expectations
   c) Organization's effort in development
   d) None of the above

3) Which is not a product metric ?
   a) Size b) Reliability
   c) Productivity d) Functionality

4) Prototyping is used to
   a) Test the software as an end product
   b) Expand design details
   c) Refine and establish requirements gathering
   d) None of the above

P.T.O.

5) Which model is simplest model in software development ?
   a) Waterfall model b) Prototyping model
   c) Iterative model d) None of these

6) During software development which factor is most crucial ?
   a) People b) Product
   c) Process d) Project

7) Software quality is
   a) Conformance to requirement b) Fitness for the purpose
   c) Level of satisfaction d) All of the above

8) Software testing is done to
   a) Correct an error b) Show absence of defect
   c) Find an error d) None of these

9) Basis path testing is
   a) Both black and white box b) White box testing method
   c) Black box testing d) Can't say

10) _____ is not a type of control structure testing.
   a) Equivalence analysis b) Basis path testing
   c) Loop testing d) Conditional testing

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

1) Data dictionary is a structured repository of data about data.
2) Prototyping motivates the end user and requires his active participation.
3) Program specifications for all proposed program in a system must precede a feasibility study.
4) Flow of information in an organization is always vertical.

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

1) Object oriented analysis
2) Metric indicators.

B) Answer the following : **6**

1) Explain software crisis in brief.
2) Explain analysis modeling in brief.

3. Answer the following :

   A) What is meant by software myths ? Explain various software myths used in software engineering. **7**

   B) Define software engineering. Explain the evolving role of software. **7**

4. Answer the following :

   A) What are the merits and demerits of linear sequential model ? **7**

   B) Explain the various characteristics of software. **7**

5. Answer the following :

   A) What is a software process ? Explain layered technology of software engineering. **7**

   B) What is meant by software quality ? Explain various quality factors considered in software development. **7**

6. Answer the following :

   A) What is software testing ? How is white box testing differ from black box testing ? **7**

   B) Explain the various notations used in object – oriented design. **7**

7. Answer the following :

   A) Explain architectural design with suitable example. **7**

   B) Explain the various elements of the analysis model. **7**

SLR-MM – 211

Seat No.	

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

Day and Date : Monday, 23-11-2015 Max. Marks : 70
Time : 10.30 a.m. to 1.00 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) The principle that every constant, variable, expression, or function is of a certain
   a) Binary Search b) Data Argument
   c) Queue d) Data Type

2) A _____ is disadvantageous result of priority queue; in which elements in a queue suffers from indefinite blocking state.
   a) Fragmentation b) Starvation
   c) Compaction d) Data hiding

3) If almost all elements are zero in a matrix, then such matrix is called
   a) 3-Dimensional Matrix b) Sparse Matrix
   c) Multidimensional Matrix d) 2-Dimensional Matrix

4) In _____, each cell consisting of an element of the list and a pointer to the next cell on the list.
   a) Matrix b) Stack
   c) Singly Linked d) Tree

5) The trick is to find a _____ to compute an index so that an object can be stored at a specific location in a table such that it can easily be found.
   a) Indexing function b) Do while loop
   c) Nested function d) Hash function

P.T.O.

6) Familiar examples of _____ are genealogies and organization charts.
   a) Queue b) Tree
   c) Chart Software d) Array

7) A greedy algorithm selects that option which is "_____" in some particular sense.
   a) Locally optimal b) Globally optional
   c) Reasonable d) Doubtful

8) A _____ is a list in which all insertions and deletions are made at one end, called the
   a) Queue and Rear b) Linked List and NULL
   c) Stack and Top d) Tree and Root

9) If a binary tree of arithmetic expression needs to be traversed and result is in the form of operand followed by the operator, then it's a _____ traversing.
   a) Pre-order b) Post-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) State **true** or **false** : **4**

1) A selection sort is the breaking a problem of size *n* into smaller problems in such a way that from solutions to the smaller problems.

2) The form of a branch and bound algorithm may vary, but there is the common theme of a table to fill and an order in which the entries are to be filled.

3) In breadth-first, each vertex visited is placed in the queue once, so the body of the while loop is executed once for each vertex.

4) An array consists of components which are all of the same type, called its *base type;* it is therefore called a *homogeneous* structure.

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

1) Circular Linked List.

2) Primitive Data Type.

B) Answer the following : **6**

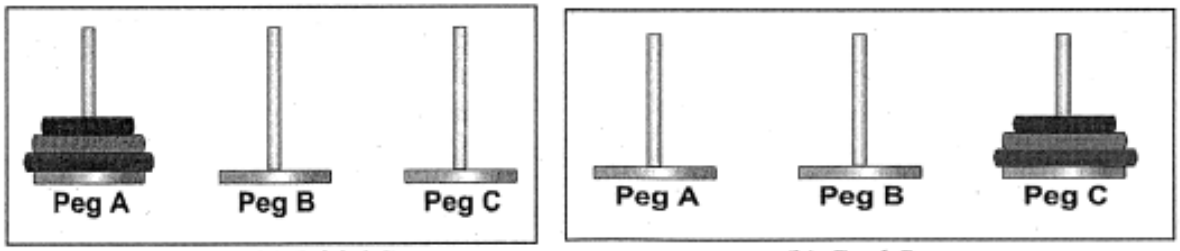
1) Define the term Data Structure.

2) What do you mean by Backtracking ?

3. Answer the following :

A) What do you mean by Doubly Linked List ? Discuss in detail insertion, deletion and traversing on Doubly Linked List with suitable example. **7**

B) Explain in detail Tower of Hanoi problem and its solution with suitable example ? **7**



(a) Initial State (b) Goal State

4. Answer the following

A) What do you mean by Queue ? Discuss in detail the concept of Dequeue with suitable example. **7**

B) Define the term Binary Tree. Generate a Binary Tree from given series and show the results of Pre-order, In order and Post-order traversing at constructed Binary Tree.

Series : 55, 3, 72, 100, 12, 60, 43, 10, 8, 83, 39, 5, 66, 91, 26 **7**

5. Answer the following :

A) What do you mean by Sorting ? Perform Selection Sort and show the result in passes on following series :

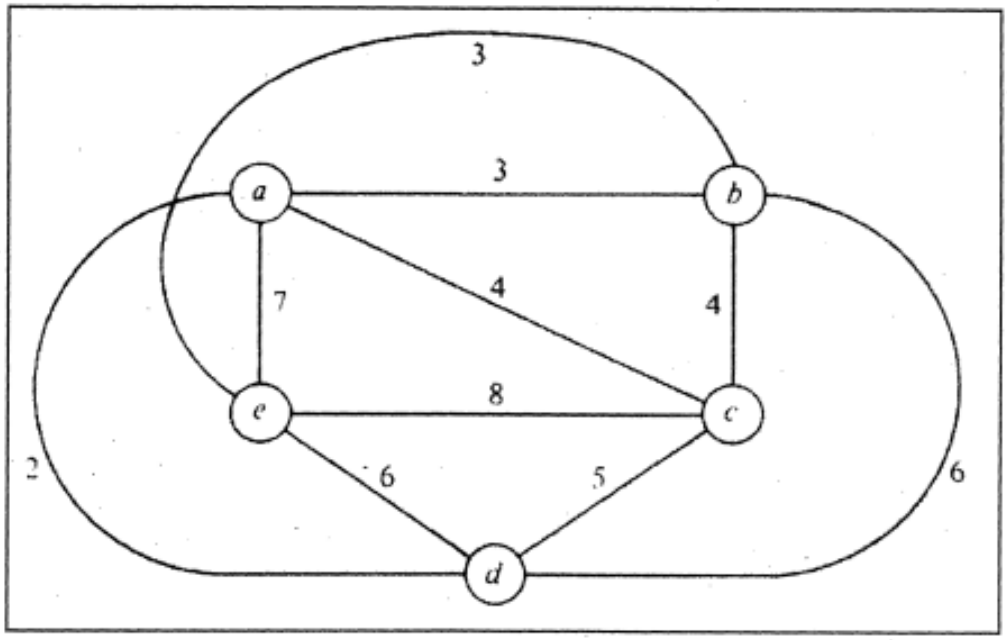
Series : 19, 36, 51, 83, 28, 90, 319, 57, 33, 200, 3, 10, 8, 193, 30 **7**

B) Explain representations and applications of single and multidimensional array with suitable example. **7**

6. Answer the following :

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

   B) What is Dijkstra's algorithm ? Discuss how it will be useful for visiting all nodes shown in graph while not visiting each node twice. **7**



7. Answer the following :

   A) State the algorithm for conversion of infix into prefix string. Apply the same on given infix expression show its conversion into postfix string.

   Infix Expression : ((a + b) + c* (d + e) + f) * (g + h) **7**

   B) Define and 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 : 3, 10, 1, 613, 19, 100, 61, 35, 98, 13, 89, 77, 6, 55, 103

SLR-MM – 212

Seat No.	

M.Sc. I (Semester – II) (Computer Science) (CGPA) (New) Examination, 2015
Paper – V : JAVA PROGRAMMING

Day and Date : Tuesday, 17-11-2015 Total Marks : 70

Time : 10.30 a.m. to 1.00 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) What is the default container layout for Applet ?

a) FlowLayout b) CardLayout

c) BorderLayout d) GridLayout

2) Machine independent byte code is interpreted by

a) Java interpreter b) Java compiler

c) Java Virtual Machine d) Browser

3) _____ keyword is used to declare the symbolic constant.

a) finally b) const

c) constant d) final

4) What is the output of the following program ?

```
public class test {
   public static void main (String arg[ ]) {
        switch (5)
      { case 5 : System.out.print("5");
      default : System.out.print("10");
      case 6 : System.out.print("6");
      }
   }
}
```

a) 5 b) 510 c) 5106 d) 56

P.T.O.

5. What is the output of the following program ?

```
public class test {
    public static void main(String arg[ ]) {
        int a = 5;
        for (; a < 5;);
            a++;
        System.out.print(a);
    }
}
```

a) Compilation error b) 6
c) 7 d) 5

6) What is the output when you compile and run the following code ?

```
public class test
 {
    public static void main(String[ ] args)
    {
       String str="world";
       char c = 'X';
       String s=str+c;
       System.out.print(s);
    }
}
```

a) world b) worldX c) world'X' d) compiler error

7) Which exception is thrown by the read( ) method of InputStream class ?
a) Exception b) ClassNotFoundException
c) read Exception d) IOException

8) One interface can inherit another by use of the keyword
a) public b) extends
c) method name d) class name

9) _____ is a special member function.
a) Method b) Class
c) Use defined function d) Constructor

10) Keyword _____ is always a reference to the object.
a) new b) this c) invoke d) class

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

1) A *Textfield* can multiple lines of text.
2) Declaration must be the first non comment statement in the Java program file.
3) The *finalize* method is called by the garbage collector, just before releasing the object's memory.
4) *Exception* and *Error* classes are both subclasses of the *Throwable* class.

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

i) Garbage Collector
ii) Border Layout.

B) Answer the following : **6**

i) Why is Java called the "Platform Independent Programming Language" ?
ii) What is the difference between private, protected and public ?

3. Answer the following :

a) What are different AWT controls ? Explain any two in detail. **7**

b) Write a program to determine whether a given number is a member of the Fibonacci sequence or not. Use method named isFibnocci( ) in this program that will accept an integer and return the Boolean value true (if integer is a member of the Fibonacci sequence) or false (if integer is not a member of the Fibonacci sequence). **7**

4. Answer the fallowing :

a) State the purpose of the following JDBC classes and interfaces

i) Driver manager
ii) Connection
iii) Statement. **9**

b) What's the difference between an interface and an abstract class ? Also discuss the similarities. **5**

5. Answer the following :

   a) Describe the wrapper classes in Java. **7**

   b) What is a package ? What are the benefits of packages ? With example describe how a package is created and imported. **7**

6. Answer the following :

   a) Describe FileReader and FileWriter classes. **8**

   b) If a four-digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number. **6**

7. Answer the following :

   a) What is multithreading ? Explain the life cycle of a thread. **7**

   b) What is the difference between Exception and Error in Java ? Explain how exceptions are handled in Java. **7**

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SLR-MM – 213

Seat No.	

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

Day and Date : Thursday, 19-11-2015 Total Marks : 70
Time : 10.30 a.m. to 1.00 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**

1) Which of the following is not a service primitive in connection oriented service ?
   a) SEND
   b) CONNECT
   c) LISTEN
   d) ACKNOWLEDGE

2) Which of the following statement is more appropriate ?
   a) Request-reply service is a connection oriented
   b) Reliable byte stream service is connection oriented
   c) Remote login uses connectionless service
   d) Digitized voice needs acknowledged datagram

3) The Hamming distance is
   a) The number of bit positions in which two code words differ
   b) The number of bit positions in which two code words match
   c) The maximum number of bits among two code words
   d) The minimum number of bits among two code words

4) The *info* field in the frame header contains _____
   a) Control information
   b) Data information
   c) Actual data to be transferred
   d) Both a) and b)

P.T.O.

5) Which of the following order of real time transport protocol packet nesting is true ?
   a) RTP header, UDP header, IP header, Ethernet header
   b) RTP header, IP header, UDP header, Ethernet header
   c) Ethernet header, UDP header, IP header, RTP header
   d) IP header, Ethernet header, UDP header, RTP header

6) Which of the following protocol uses port 80 ?
   a) SMTP b) FTP c) HTTP d) POP-3

7) The transport entities implementing the transport protocols have to handle _____
   a) Sequencing b) Error control
   c) Flow control d) All the above

8) Which of the following statement(s) is/are false for virtual circuit subnet ?
   a) Routers do not hold state information about connections
   b) Congestion control is easy if enough resource allocated
   c) Circuit setup is required
   d) Both a) and b)

9) Packet life time management is implemented by _____
   a) Data link layer b) Transport layer
   c) Network layer d) Both b) and c)

10) An application for video on demand expects _____
   a) High jitter b) Low bandwidth
   c) High reliability d) High delay

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

1) The _____ model does not have session or presentation layer.

2) Protocols in which sender sends one frame and then waits for an acknowledge before proceeding are called _____

3) In a routing algorithm the routers do not send every incoming packet out on every line, but only on those lines that are approximately going in the right direction. Such algorithm is called _____

4) In TCP port 21 is assigned to _____

2. A) Write short notes on the following : **8**
   i) Framing
   ii) Fragmentation.
   B) Answer the following : **6**
   i) What is remote procedure call ?
   ii) Explain electronic mail message formats.

3. Answer the following : **14**
   A) Describe internet architecture.
   B) Discuss different error detecting codes.

4. Answer the following : **14**
   A) Explain the data link layer protocol using Go Back N.
   B) Give comparison of virtual circuits and datagram subnets.

5. Answer the following : **14**
   A) What are the congestion prevention policies ? Discuss.
   B) What is tunneling ? How it is done ? Explain.

6. Answer the following : **14**
   A) Discuss real time transport protocol.
   B) How connection is done using TCP ? Explain.

7. Answer the following : **14**
   A) What are name servers ? What are their functions ? Explain.
   B) How electronic mail message transfer works ? Discuss.

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SLR-MM – 214

Seat No.	

M.Sc. I (Semester – II) (CGPA) (New) Examination, 2015
COMPUTER SCIENCE
UML (Paper – VII)

Day and Date : Saturday, 21-11-2015 Total Marks : 70
Time : 10.30 a.m. to 1.00 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) What is a named object in UML ?

a) Matt : Employee b) : Employee

c) Matt :: Employee d) :: employee

2) Which is a UML general-purpose mechanism for organizing elements into groups ?

a) a class diagram b) an activity

c) a package d) a composite diagram

3) A interface is

a) A set of objects used to provide a specific behaviour

b) A set of classes used on collaboration

c) A set of attributes used on an operation

d) A set of operations used to specify a service of a class or component

4) The activity diagram

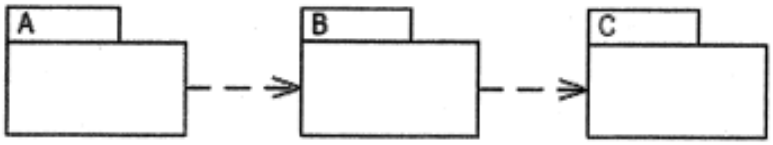
a) Focuses on flows driven by internal processing

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

5) Which is the valid event in a State diagram ?



a) if( ) b) when( ) c) close( ) d) else( )

6) If you want to plan project activities such as developing new functionalities or test cases, which of the following OOAD artifacts is the most useful ?

a) Sequence diagrams b) Use cases

c) Domain model d) Package diagrams

7) What is a true statement about the following packages ?

a) If package C changes, package B must be inspected for necessary changes, and if there are any, package A may have to be adapted as well

b) If package B changes, package A and package C must be inspected for necessary changes

c) Packages should be designed so that a change in one package does not have an effect to other packages

d) If package C changes, package A has to be examined (as well as B), because dependencies are transitive

8) Tagged values can be represented in UML by

a) [text string] b) {text string}

c) notes d) constraint

9) 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

10) 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

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

1) Generalization allows abstracting common features and defining them in a super-class.

2) A note is a dog-eared box connected to any model element by a dashed line.

3) In UML, a class is represented by a rectangle with three compartments separated by vertical lines.

4) The UML notation is useful for graphically depicting an object-oriented analysis or design model.

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

i) Features of OOP.

ii) Behavioral things.

B) Answer the following. **6**

i) What is the difference between adding a tagged value to a class as opposed to adding a new data member to the class that can hold the same value ?

ii) What are the different aims that are achieved through modeling ?

3. Answer the following.

a) Define polymorphism, overloading and information hiding. **6**

b) Explain the types of diagrams in UML. **8**

4. Answer the following.

a) UML is made simpler by using the common mechanisms. What are the four common mechanisms that apply consistently ? **7**

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

5. Answer the following.

a) What is forward engineering and reverse engineering ? **6**

b) What is collaboration ? How it is represented in UML ? What are the two aspects of collaborations ? **8**

6. Answer the following.

   a) Explain with example abstract, root, and leaf elements. **6**

   b) What is use case and actor ? For what purpose use case diagrams are drawn ? What are its elements ? **8**

7. Answer the following.

   a) Describe the concept of swimlanes and object flows. **6**

   b) Describe event. What are the four kinds of events that you can model using UML. **8**

SLR-MM – 215

Seat No.	

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

Day and Date : Tuesday, 24-11-2015 Max. Marks : 70

Time : 10.30 a.m. to 1.00 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. Choose correct alternatives. **10**

   1) Relational calculus is

      a) Procedural language b) Non-procedural language

      c) Data definition language d) High level language

   2) Attributes refers to

      a) The properties of an entity b) The names of an entity

      c) Both (a) and (b) are correct d) Both (a) and (b) are wrong

   3) The functions Avg, Count, Max and Min

      a) Supported only by SQL

      b) Supported only by QBE

      c) Supported by both SQL and QBE

      d) Supported by none

   4) A _____ monitors and controls the execution of programs so that the database includes only the result of transactions that run to a normal completion.

      a) Recovery algorithm b) Integrity algorithm

      c) Distributed algorithm d) Efficiency algorithm

P.T.O.

5) When more than one attributes of a table are related with many attributes of one or more other tables then such a relationship is known as
   a) One to one relationship
   b) Many to many relationship
   c) Many to one relationship
   d) One to many relationship

6) An index file is an example of
   a) Sequential file
   b) Main memory data block
   c) Application of indices
   d) None of the above

7) 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)

8) A trigger is
   a) A statement that enables to start any DBMS
   b) A statement that is executed by the user when debugging an application program
   c) A condition the system tests for the validity of the database user
   d) A statement that is executed automatically by the system as a side effect of a modification to the database

9) The entity-relationship model comes under
   a) Object based logical model
   b) Record based logical model
   c) Physical data model
   d) None of the above

10) A _____ is a database that type of database in which storage devices are not all attached to a common CPU.
   a) Integrated database
   b) Distributed database
   c) Local database
   d) None of these

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

1) Collection of related records is known as tuple.
2) The function of a database is to collect and organize input data.
3) Join is one of the traditional set operator defined on relational algebra.
4) A database system is fully relational if it supports relational databases and a language as powerful as relational algebra.

2. A) Write short notes on the following : **8**
   i) Multi-valued dependency.
   ii) Boyce Codd's normal form.

   B) Answer the following : **6**
   i) Explain log-based recovery in brief.
   ii) Explain advantages of views in SQL.

3. Answer the following :
   A) What is meant by relational algebra ? Explain fundamental relational algebraic operations. **7**
   B) Define DBMS. Explain advantages and disadvantages of DBMS. **7**

4. Answer the following :
   A) Explain the cursor with suitable example. **7**
   B) Write a PL/SQL program to calculate the area of circle. **7**

5. Answer the following :
   A) Explain two ways of Data Fragmentation with example. **7**
   B) Explain ACID properties of transaction with suitable example. **7**

6. Answer the following :
   A) What is meant by distributed database ? Explain the types of distributed database. **7**
   B) What is meant by locks ? Explain how we can implement and grant lock. **7**

7. Answer the following :
   A) Define normalization. Explain 1NF and 2 NF with suitable example. **7**
   B) What is meant by entity sets ? Explain the difference between strong entity sets and weak entity sets. **7**

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SLR-MM – 216

Seat No.	

M.Sc. I (Sem. – II) Examination, 2015
(Old CGPA)
COMPUTER SCIENCE
Operations Research (Paper No. V)

Day and Date : Tuesday, 17-11-2015 Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

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

1) In a simplex method if all the elements in the key column are negative then there is an _____ solution.

2) The basic feasible solution to LPP is said to be degenerate if at least one basic variable is _____

3) The _____ strategy is a decision rule always to select a particular course of action.

4) The standard form of objective function in a quadratic programming problem is _____

5) Intersection of any finite number of convex sets is also a _____

6) A quadratic form Q(X) is positive definite iff _____

7) A cone is called convex cone if it is a _____ set.

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

1) The number of dual constraints is exactly equal to

a) No. of primal constraints

b) No. of primal variables

c) No. of slack variable

d) No. of artificial variables

P.T.O.

2) A simplex method is

a) Algebraic procedure for solving LPP

b) Geometric procedure for solving LPP

c) Both a) and b)

d) None of these

3) If there is an optimal solution to LPP then optimal solution exists at

a) Boundary point b) Interior point

c) Exterior point d) Extreme point

4) If the primal problem has an unbounded solution then the dual problem will have _____ solution.

a) Unbounded b) Feasible

c) No feasible d) Optimum

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

1) An extreme point cannot be between any other two points of the set

2) Branch and bound method is used for solving QPP.

3) Every solution is a feasible solution to linear programming problem.

2. a) State the rules for determining the saddle point. **3**

b) Obtain the dual of following LPP

Min $z = 3x_1 - 2x_2 + 4x_3$ **4**

Subject to,

$3x_1 + 5x_2 + 4x_3 \geq 7$

$6x_1 + x_2 + 3x_3 \geq 4$

$7x_1 - 2x_2 - x_3 \leq 10$

$x_1 - 2x_2 + 5x_3 \geq 3$

$4x_1 + 7x_2 - 2x_3 \geq 2$

and $x_1, x_2, x_3 \geq 0$

c) Let S and T be two convex set S in R^n then prove that $\alpha S + \beta T$ is also a convex $(\alpha, \beta \in R)$. **4**

d) State the matrix form of symmetric primal form and dual form. **3**

3. a) P.T. the dual of the dual of given primal is the primal. **7**

   b) Solve the following LPP by two phase method

   Min $z = \frac{15}{2}x_1 - 3x_2$

   Subject to the constraints,

   $3x_1 - x_2 - x_3 \geq 3$

   $x_1 - x_2 + x_3 \geq 2$

   and $x_1, x_2, x_3 \geq 0$ **7**

4. a) For the game with pay off matrix

$$\begin{array}{c} \\ \textbf{Player A} \end{array} \begin{array}{c} \textbf{Player B} \\ \begin{bmatrix} -1 & 2 & -2 \\ 6 & 4 & -6 \end{bmatrix} \end{array}$$

   Determine the best strategies for players A and B and also the values of game for them. Is this game

   i) Fair

   ii) Strictly determinable ? **7**

   b) P.T. the set of all convex combinations of a finite number of points $x_1, x_2 \ldots x_m$ is a convex set. **7**

5. a) Solve the following problem by Beale's method.

   Max $Z = 2x_1 + 3x_2 - x_1^2$

   Subject to the constraints,

   $x_1 + 2x_2 \leq 4$

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

   b) Give the algorithm of branch and bound method. **7**

6. a) P.T. if the convex set of the feasible solutions of $Ax = b$, $b \geq 0$ is a convex polyhedron, then at least one of the extreme points gives an optimal solution. **7**

   b) Write down the dual of following linear programming problem and solve it.

   Max $Z = 4x_1 + 2x_2$

   Subject to the constraints

   $-x_1 - x_2 \leq -3$

   $-x_1 + x_2 \leq -2$

   and $x_1, x_2 \geq 0$

   Hence or otherwise write down solution of primal. **7**

7. a) Solve the following LPP by simplex method.

   Max $z = 3x_1 + 2x_2$

   Subject to the constraints,

   $x_1 + x_2 \leq 4$

   $x_1 - x_2 \leq 2$ and $x_1, x_2 \geq 0$. **7**

   b) If K^{th} constraint of the primal is an equality then prove that the dual variable W_k is unrestricted in sign. **7**

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SLR-MM – 217

Seat No.	

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

Day and Date : Thursday, 19-11-2015 Max. Marks : 70
Time : 10.30 a.m. to 1.00 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) The disadvantage of a ring network topology is that

a) It requires a dedicated server for the network

b) The network will be down if one of its nodes is down

c) The terminals are busy all the time

d) The users have equal rights

ii) The hardware responsible for converting digital signals into analog ones and vice versa in computer communication is

a) Digitizer b) Microphone

c) Modem d) Terminal

iii) Which of the following is NOT a communication software ?

a) Email client b) Flash

c) FTP d) Web browser

iv) Which of the following applications is an example of computer communication ?

a) Video on demand b) Database management

c) Graphics design d) Conferencing

v) What kind of network topology is analogous to the operation of an Internet service provider ?

a) Bus b) Ring c) Star d) WAN

P.T.O.

vi) A Digital Signature is

a) scanned signature b) encrypting information

c) signature in binary form d) handwritten signature

vii) Mechanism to protect private networks from outside attack is

a) Firewall b) Digital signature

c) Antivirus d) Formatting

viii) A device that forwards data packet from one network to another is called a

a) Bridge b) Hub c) Switch d) Gateway

ix) Which of the following is the fastest media of data transfer

a) Co-axial Cable b) Telephone Lines

c) Untwisted Wire d) Fiber Optic

x) HTML is a

a) Scripting Language b) Network Protocol

c) Programming Language d) Web Browser

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

i) RFC stands for _____

ii) _____ is used to transfer data/files among computers on the Internet.

iii) Secret-key encryption is also known as _____

iv) In TCP protocol header "checksum" is of _____ bits.

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

i) Wireless TCP and UDP

ii) ARPANET

B) Answer the following **6**

i) Discuss in brief Connection Oriented and Connectionless service Primitives.

ii) What is Optimality Principle ? Explain.

3. Answer the following. **14**

A) Explain the architecture of Mobile IP.

B) What is Congestion Control ? Discuss congestion Control Algorithm.

4. Answer the following. **14**

A) Discuss the transport service primitives.

B) Explain Error detection techniques.

5. Answer the following. **14**

   A) Explain the Service model of IPv6.

   B) Discuss the brief Static and Dynamic web documents.

6. Answer the following. **14**

   A) What is cryptanalysis ? Explain transposition ciphers.

   B) Explain the Symmetric key cryptographic principles.

7. Answer the following. **14**

   A) What is Tunneling ? Explain

   B) Explain how does crash recovery is done at transport layer.

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Seat No.	

M.Sc. – I (Semester – II) Examination, 2015
COMPUTER SCIENCE
Paper – VII : UML (Old CGPA)

Day and Date : Saturday, 21-11-2015 Max. Marks : 70

Time : 10.30 a.m. to 1.00 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) What is the focus of analysis ?
   a) Translating functional requirements into code
   b) Translating requirements into a system design
   c) Translating real-world concepts into solution-oriented objects
   d) Translating functional requirements into software concepts

2) Which statement is true about grouping elements into a package ?
   a) Elements in a package should share a logical, common grouping
   b) Packages should contain a small number of elements to avoid confusion
   c) Packages should only be used on large projects requiring a large number of elements
   d) Packages should not contain other packages

3) Which view focuses on the physical realization of the system ?
   a) Logical View b) Implementation View
   c) Process View d) Use-Case View

4) You can specify that a class may have no children by writing the property _____ below the class name in the class diagram.
   a) {root} b) {abstract} c) {overriding} d) {leaf}

5) _____ visibility is specified by prefixing # to the method/attribute name.
   a) Public b) Protected c) Private d) Static

6) _____ is the process of transforming code into a model.
   a) Forward Engineering b) Analysis
   c) Reverse Engineering d) Testing

7) _____ means "whole/part" relationship.
   a) Multiplicity b) Aggregation c) Role d) Generalization

8) A _____ is a using relationship that states that a change in specification of one thing may affect another thing that uses it.
   a) Dependency b) Generalisation
   c) Association d) None of these

9) _____ is a collection of operations that are used to specify a service of a class or a component.
   a) Node b) Signal c) Interface d) Visibility

10) Which of the following is a named object in UML ?
   a) Matt.Employee b) Employee
   c) Matt:: Employee d) ::employee

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

1) The UML is a modelling language for software blueprints.
2) An active object does not contain state.
3) Nodes are the things that execute components.
4) Use case diagram shows flow of control from activity to activity.

2. A) Write short notes on the following : **8**
   i) Abstract classes ii) Join and fork.

B) Answer the following : **6**
   i) What is importance of modeling ?
   ii) What are the different adornments that can be applied to associations ?

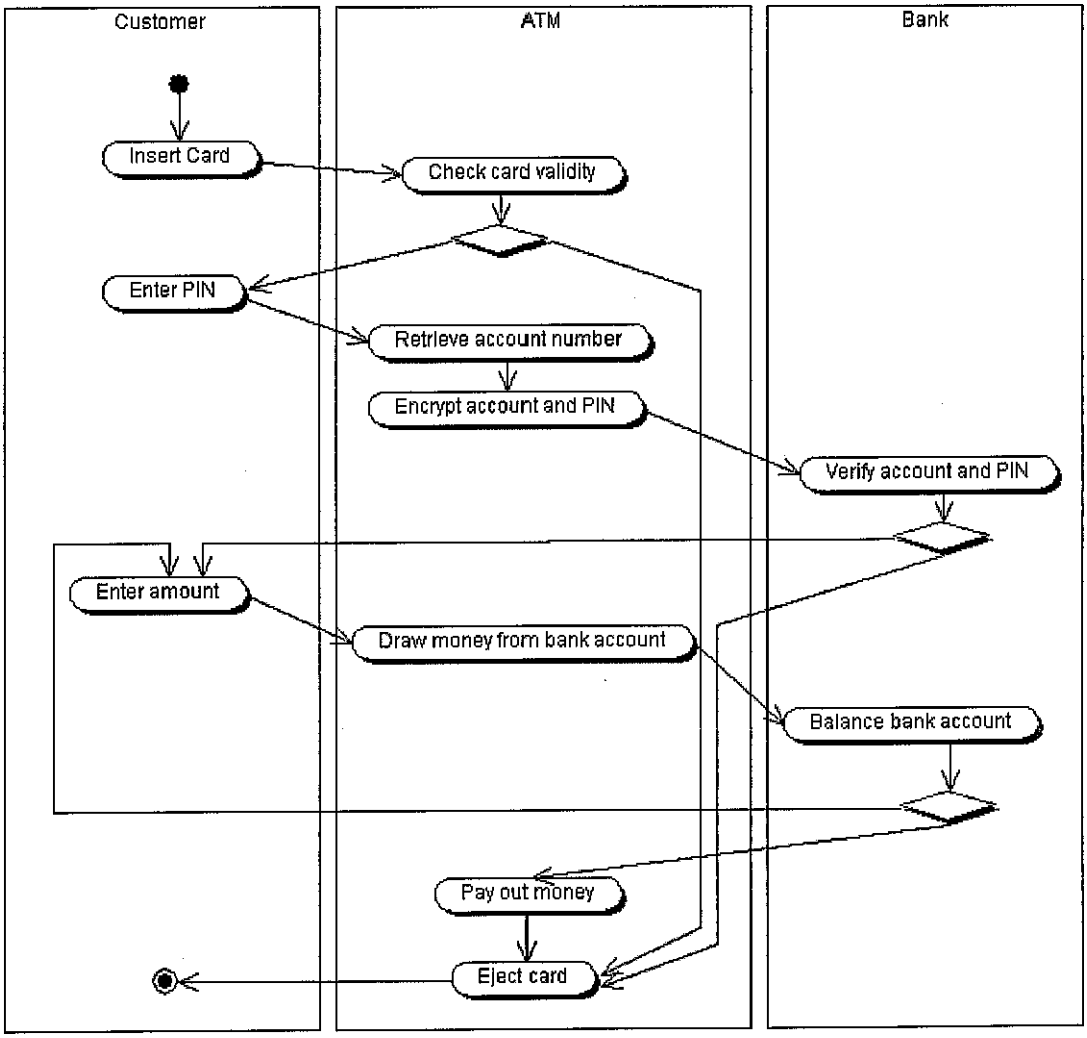
3. Answer the following :

a) What UML diagram types exist ? Name each diagram type and describe its main purpose. **8**

b) Model the relationship between a car (that has an engine and a color) and its owners (having a name) in a UML class diagram. A car can have several owners over time, but only one or none owner at a time. Do not forget cardinalities, role names, attributes and their types. **6**

4. Answer the following :

a) Below an activity diagram is shown. Give an interpretation of the diagram. Describe the workflow that is shown in full sentences that are understandable separate from the diagram. Write about 10 short sentences. **8**



b) What diagram types (s) can be used to describe the following : **6**

- Behaviour of an object
- Life-cycle dependencies of objects
- Location of software components on the hardware.

5. Answer the following :
   a) Explain sequence diagram with suitable example. **8**
   b) What is generalized relationship ? What are the four constraints that can be applied to generalization relationships ? **6**

6. Answer the following :
   a) What is a component ? What are different kinds of components ? What are the standard stereotypes that apply to components ? **6**
   b) UML is made simpler by the presence of four common mechanisms. What are those common mechanisms ? Give example of each. **8**

7. Answer the following :
   a) Describe use cases that a college library provides to the students and staff. Draw the Use Case Diagram of the same. **7**
   b) What is an event ? How events are represented graphically in UML ? In UML four types of events can modeled. What are those events ? **7**

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Seat No.	

M.Sc. – I (Sem. – II) (Computer Science) Examination, 2015
(Old CGPA)
Paper – VIII : DBMS

Day and Date : Tuesday, 24-11-2015 Total Marks : 70
Time : 10.30 a.m. to 1.00 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) _____ means that various copies of the same data may no longer agree.
   a) Primary Key b) Data inconsistency
   c) Data redundancy d) Data isolation

2) The overall design of the database is called the database _____
   a) instance b) schema
   c) subschema d) none of these

3) The set of all entities of the same type is termed as _____
   a) Relationship set b) Attribute set
   c) Entity set d) None of these

4) SQL stands for _____
   a) Standard Query Language b) Structured Query Language
   c) Sequential Query Language d) Serial Query Language

5) _____ attributes can be divided into subparts.
   a) Composite b) Simple
   c) Single-valued d) None of these

6) _____ is a language in which a user requests information from the database.
   a) Query language b) Procedural language
   c) English language d) Machine language

P.T.O.

7) _____ are functions that take a collection of values as input and return a single value.
   a) Aggregate functions b) Date functions
   c) String functions d) None of these

8) A _____ is the right to access an object such as table, view etc.
   a) Privilege b) Select c) User d) None of these

9) A domain is _____, if elements of the domain are considered to be indivisible.
   a) Attribute b) Nonatomic c) Atomic d) Field

10) _____ is the initial state of any transaction.
   a) Active b) Partially committed
   c) Failed d) Aborted

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

1) _____ ensures that either all the effects of a transaction are reflected in the database or none are.

2) The process of finding a good strategy for processing a query is called _____

3) In SELECT command _____ clause is used for grouping occurrences on specified columns.

4) _____ function returns the largest integer less than or equal to n.

2. a) Write short notes on the following. **8**
   i) Keys
   ii) Domains and attributes.

   b) Answer the following. **6**
   i) What are the functions of DBA ?
   ii) Explain the differences between a file-oriented system and a database-oriented system.

3. Answer the following.
   a) What is normalization ? Explain 2NF with example. **6**
   b) Describe the architecture of DBMS. **8**

4. Answer the following.

   a) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accident. **8**

   b) What are the different types of database users ? **6**

5. Answer the following.

   a) Describe steps involved in query processing. **6**

   b) Consider the following relational database : **8**

   Patient (patientName, pAddress, doctorName)

   Doctor(doctorName, dAddress, hospitalName)

   Hospital(hospitalName, hAddress)

   Write SQL commands for the following queries :

   i) Find names and address of all patients.

   ii) Find names and address of all patients treated by doctor “Ajay”.

   iii) Give name and address of the hospital where the patient “Nitin” is taking the treatment.

   iv) Find names of all doctors working in the “Rubi” hospital.

6. Answer the following.

   a) Explain the structure of PL/SQL block. Write the PL/SQL block to calculate area of circle having diameter 13.637 cm and insert the value of radius and area as a record in the table *CIRCLE (RADIUS, AREA)*. **8**

   b) What do you understand by distributed databases ? Give the various advantages and disadvantages of distributed database management system. **6**

7. Answer the following.

   a) What do you mean by fragmentation ? What are different types of fragmentation ? Explain. **7**

   b) What is the use of varying arrays ? How varying arrays are created and records are inserted in the varying arrays ? **7**

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Seat No.	

M.Sc. – II (Semester – III) (New CGPA) Examination, 2015
COMPUTER SCIENCE
Web Design Techniques (Paper – IX)

Day and Date : Monday, 16-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 p.m.

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

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

1) What are the empty elements and is it valid ?

a) No, there is no such term as empty elements

b) Empty elements are elements with no data

c) No, it is not valid to use empty elements

d) None of these

2) _____ attribute of textbox control allow to limit the maximum character.

a) Size b) Maxlength

c) Len d) All of the above

3) _____ jQuery function indicates that the contents for a page have been loaded into the browser.

a) Loaded b) Ready

c) $ d) Bind

4) _____ symbol is used at the beginning of the HREF text.

a) # b) $

c) & d) ^

P.T.O.

5) Which of the following statement is not true regarding javascript ?
   a) Javascript is a loosely typed language
   b) A javascript embedded in HTML document is compiled and executed by the client browser
   c) Javascript cannot run in standalone mode
   d) Javascript is event driven

6) CSS is acronym for _____
   a) Custom style sheet
   b) Cascading system style
   c) Cascading system sheet
   d) None of the above

7) The use of forms in HTML is _____
   a) To display contents of email
   b) To display animation effect
   c) To collect users input
   d) None of the above

8) XML uses the features of _____
   a) SGML
   b) HTML
   c) XHTML
   d) VML

9) Namespace _____
   a) Is a querying language
   b) Distinguishes one XML vocabulary from another
   c) Provides the spaces in the names
   d) Gives the another name for element

10) _____ attribute is used to set font name.
   a) fontname
   b) face
   c) Font
   d) fn

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

1) SOAP is platform independent.

2) XML was designed to transport and store data, with focus on what data is and HTML was designed to display data, with focus on how data looks.

3) The EVENT object provides constants that are used to identify variables.

4) <BODY BGCOLOR = “IMG1.gif” TEXT = red>.

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

A) Ajax Events

B) Types of Scripts.

B) Answer the following : **6**

a) State the use of web server logs and list the contents of a message log.

b) What is the purpose of XSLT ?

3. Answer the following :

A) What is the use of HTML form ? Create a HTML page for login details. **7**

B) Write an external cascading style sheet to define the font, font colour, background and foreground colours and various table tag properties. Also use the CSS to design a web page with tables. **7**

4. Answer the following :

A) What is function ? Explain how parameters are passed to functions in javascript. **7**

B) What is jQuery ? Explain the features of jQuery. **7**

5. Answer the following :

   A) Write an HTML source to display the following table. **7**

Roll No	Student Name	Subjects			Total Marks
		JAVA	WEB DEVELOPMENT	C++	

   B) Explain the various event handlers in javascript. Give an example. **7**

6. Answer the following :

   A) Explain the following HTML tags with all attributes. **7**

      i) <h1>

      ii) <font>

      iii) <style>

      iv) <head>

   B) Explain the DOM architecture. **7**

7. Answer the following :

   A) Explain AJAX briefly. **7**

   B) Write a javascript program to print Armstrong numbers between 1 and 100. **7**

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Seat No.	

M.Sc. (Part – II) (Sem. – III) Examination, 2015
COMPUTER SCIENCE
Paper – X : Artificial Intelligence
(New CGPA)

Day and Date : Wednesday, 18-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 p.m.

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

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

1) In _____ is a program that provides advice on mineral exploration.
   a) Design Advisor b) Prospector
   c) Meta Dendral d) Design Analyser

2) Spot the Planning Sequence as a part of Discourse and Pragmatic processing from a text _____
   a) The slop has collections of stickers as stars, moon and a flag. I will take two moons.
   b) Suresh opened the book for reading. The title page was torn.
   c) The shop was broken into last week. They took the TV and the stereo.
   d) Mohammad wanted a new bike. She decided to get a job.

3) The _____ gives a plausibility that ranges between '0' to '1' and measures the extent to which evidence in favor of negation of a set of proposition leaves room for belief in a set of proposition.
   a) Newell, Shaw and Simon Theory
   b) Dempster Shafer Theory
   c) Baye's Theorem
   d) Theory of Artificial Intelligence

P.T.O.

4) It is the job of the search method to decide on the order in which rules will be applied; but sometimes it is useful to incorporate some of that decision making into the matching process. This phase of matching process is then called _____
   a) Hashing b) Conflict Resolution
   c) Clause Form d) MOLE

5) _____ produces proof by refutation.
   a) Formal Logic b) Computable functions
   c) Resolution d) Proposition Logic

6) To implement a graph search procedure the _____ list is maintained to store the nodes that have been generated and has the heuristic function applied to them but which have not yet been examined.
   a) CLOSED b) OPEN
   c) PARTIAL CLOSED d) FUTILITY

7) A direction in which to conduct the search can be a search _____ through the state space from the goal state to a start state.
   a) Forward b) Bidirectional
   c) Round and Reverse d) Backward

8) A fuzzy set theory allows us to represent set of membership as a _____
   a) Possibility Assertion b) Possibility Inculcation
   c) Possibility Distribution d) Possibility Experimentation

9) Both *isa* and *instance* relations have _____, which can be called *subclasses* and *all-instances*.
   a) Inverse attributes b) Pure attributes
   c) Simple attributes d) Reverse attributes

10) An algorithm called Depth First Iterative Deepening (DFID) combines the best aspects of depth first search and _____
   a) AO* Search b) A* Search
   c) Breadth First Search d) Heuristic Search

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

1) Top-Down parsing begins with the start symbol and apply the grammar rules forward until symbols at the terminals of the tree correspond to the components of the sentence being parsed.
2) The ATTEND as set of primitive actions stands for transfer of mental information.
3) Acquisition efficiency is the ability to acquire new information easily.
4) A plateau is a special kind of local maximum.

2. A) Write a short note : **8**
   i) AI technique
   ii) Weak slot and filler structure.

   B) Answer the following : **6**
   i) Briefly explain Best-First Search.
   ii) What are the mundane task domains of Artificial Intelligence ?

3. Answer the following :

   A) What do you mean by Knowledge Representation ? Enlist and explain in detail the various issues in Knowledge Representation. **7**

   B) Define the term Heuristics. Discuss in detail concept of constraint satisfaction with suitable example. **7**

4. Answer the following :

   A) Enlist the Expert tasks. Discuss in detail Expert System Shell and process of Knowledge Acquisition to design Expert Systems. **7**

   B) What do you mean by Measure of Belief and Disbelief ? Explain in detail Certainty Factor and Rule based systems with suitable example. **7**

5. Answer the following :

   A) Define the term Predicate Logic. Explain in detail Resolution for proof planning using Predicate Logic. **7**

   B) Define the Game Playing. Discuss in detail Game Playing using Minimax Search Procedure for Two-Ply Search. **7**

6. Answer the following :

   A) Define the term Matching. Discuss the various proposals of Matching for Representing Knowledge using rules. **7**

   B) What do you mean by Conceptual Dependency ? Explain various primitive acts and rules as the dependencies of Conceptual Dependency. **7**

7. Answer the following :

   A) State and discuss in detail the various phases of Natural Language Processing. **7**

   B) What do you mean by Production System ? Demonstrate the solution for Water-Jug Problem with suitable example. **7**

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Seat No.	

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

Day and Date : Friday, 20-11-2015 Total Marks : 70
Time : 2.30 p.m. to 5.00 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) Several antennas can be combined on single pole to construct
   a) Smart Antenna
   b) Sectorized Antenna
   c) Simple dipole antenna
   d) Marconi Antenna

ii) An example for explicit reservation scheme is
   a) Demand Assigned Multiple Access
   b) Packet Reservation Multiple Access
   c) Carrier Sense Multiple Access
   d) All of these

iii) Which of the following is not teleservice provided by GSM ?
   a) Telephony
   b) Closed User Group
   c) Enhanced Message Service
   d) Emergency Number

iv) Which of the following is a function of MAC management protocol in IEEE 802.11 Wireless LAN standard ?
   a) Synchronization
   b) Roaming
   c) Power Management
   d) All of these

P.T.O.

v) The COA is _____ if the MN temporarily acquired an additional IP address that acts as COA.

a) Home Agent COA b) Foreign Agent COA

c) Co-located COA d) None of these

vi) Which of the following does not maintain end-to-end semantics of TCP ?

a) Indirect ICP b) Snooping TCP

c) Mobile TCP d) None of these

vii) Which of the following is type of android application ?

a) Foreground Activity b) Background Service

c) Intermittent Activity d) All of these

viii) The meaning term 'bonding' in case of Bluetooth is

a) Coupling b) Sharing

c) Connection d) Pairing

ix) Which of the following algorithm is used for authentication in GSM ?

a) A3 b) A5 c) A8 d) SRES

x) Infra-red technology uses diffuse light reflected at walls, furniture etc. or directed light if _____ exists between sender and receiver.

a) Infrared Data Association (IrDA) interface

b) Line-of-Sight (LOS)

c) Shielding

d) Directional Communication Propagation (DCP)

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

i) CSMA protocol solves the collision problem correctly.

ii) Roaming is possible in IEEE 802.11 Wireless LAN in ad-hoc mode.

iii) Android application development dose not use MVC architecture.

iv) In Co-located COA, registration procedure is easy.

2. A) Write a short note on following : **8**
   i) Cellular System.
   ii) Simple Bluetooth Piconet.

   B) Answer the following : **6**
   i) Explain about mobile IP in detail.
   ii) What are the different building blocks of android applications ?

3. Answer the following :
   A) What is multiplexing ? Explain different types of it. **7**
   B) Explain classical ALOHA and slotted ALOHA protocols in detail. **7**

4. Answer the following :
   A) Explain Dynamic Host Configuration Protocol in detail. **7**
   B) Discuss about traditional TCP mechanism. **7**

5. Answer the following :
   A) Explain the architecture of an infrastructure based IEEE 802.11 and Ad-hoc networks. **7**
   B) Explain the architecture of GSM system in detail. **7**

6. Answer the following :
   A) Discuss android application life cycle with application priorities and process states. **7**
   B) Explain communication with Bluetooth in android with the procedure for opening a socket, listening for data and sending the data. **7**

7. Answer the following :
   A) Explain the direct sequence spread spectrum technique and role of transmitter and receiver in it. **7**
   B) Discuss protocol architecture of IEEE 802.11 wireless LAN. **7**

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Seat No.	

M.Sc. – II (Semester – III) (Computer Science) Examination, 2015
(New CGPA)
Paper – XII : OPERATIONS RESEARCH

Day and Date : Monday, 23-11-2015 Max. Marks : 70

Time : 2.30 p.m. to 5.00 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) A constraint in an Linear programming problem restricts
   a) Value of objective function b) value of a decision variable
   c) use of a available resource d) all of the above

2) An iso-profit line represents
   a) an infinite number of solutions all of which yield the same profit
   b) an infinite number of solutions all of which yield the same cost
   c) an infinite number of optimal solutions
   d) a boundary of the feasible region

3) In the optimal simplex table, $c_j - z_j = 0$ value indicates
   a) unbounded solution b) cycling
   c) alternative solution d) infeasible solution

4) The number of basic solutions to a linear programming problem with n variables and $m(<n)$ constraints are
   a) $m + n$ b) ${}^{n}C_{m}$
   c) $m - n$ d) none of the above

5) The solution to a transportation problem with m rows and n columns is feasible if number of positive are
   a) m + n b) m × n c) m + n – 1 d) m+ n + 1

6) While finding dual of any primal form, all constraints must be in _____ form.
   a) $\leq$ b) $\geq$ c) = d) none of these

P.T.O.

7) The term commonly used for activity slack time is
   a) total float b) free float
   c) independent float d) all of the above
8) In time cost-trade of function analysis.
   a) cost decreases linearly as time increases
   b) cost at normal time is zero
   c) cost increases linearly as time increases
   d) none of the above
9. Optimistic, most likely and pessimistic times of an activity are 2, 2 and 8 respectively, then the expected time and variance activity are
   a) 3 and 1 respectively b) 3 and 3 respectively
   c) 1 and 3 respectively d) 1 and 1 respectively
10) A *st-cut* (cut) is a partition (A, B) of the vertices with
   a) $s \in A$ b) $s \in A$ and $t \in B$ c) $t \in B$ d) none of the above

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

1) Hungarian algorithm is used to solve assignment problem.
2) Every standard cost minimizing transportation problem has a feasible solution.
3) If at least one of the constraint is parallel to objective function in LPP then there exist infinite solutions.
4) PERT is a deterministic model.

2. A) Write short notes on the following : **8**
   i) Convex functions ii) Critical Path Analysis.

B) Answer the following : **6**

i) What do you mean by an optimal basic feasible solution to a linear programming problem ?
ii) Describe the transportation problem with its general mathematical formulation.

3. Answer the following :

A) Use the graphical method to solve the following LP problem.
Minimize $z = -x_1 + 2x_2$
Subject to the constraints
$-x_1 + 3x_2 \leq 10$
$x_1 + x_2 \leq 6$
$x_1 - 3x_2 \leq 2$
and $x_1, x_2 \geq 0$. **7**

B) Explain various steps of the simplex method involved in the computation of an optimum solution to a linear programming problem. **7**

4. Answer the following :

A) Give the algorithm of Dual Simplex method. **7**

B) A project work consists of four major jobs for which an equal number of contractors have submitted tenders. The tender amount quoted (in lakhs of rupees) is given in the matrix.

Contractor	Job			
	A	B	C	D
1	10	24	30	15
2	16	22	28	12
3	12	20	32	10
4	9	26	34	16

Find the assignment which minimizes the total cost of the project, when each contractor has to be assigned at least one job. **7**

5. Answer the following :

A) What is meant by critical path in Network Analysis ? **2**

B) The owner of a chain of fast food restaurants is considering a new computer system for accounting and inventory control. A computer company sent the following information about the computer system installation.

Activity	Activity Description	Immediate Predecessor	Times (days)		
			Optimistic	Most likely	Pessimistic
A	Select the Computer model	_____	4	6	8
B	Design input/output system	A	5	7	15
C	Design monitoring systems	A	4	8	12
D	Assemble computer Hardware	B	15	20	25
E	Develop the main problem	B	10	18	26
F	Develop input/output routines	C	8	9	16
G	Create data base	E	4	8	12
H	Install the system	D, F	1	2	3
I	Test and implement	G, H	6	7	8

a) Construct PERT network diagram for this problem.

b) Determine the critical path and compute the expected completion time.

c) Determine the probability of completing the project in 55 days. **12**

6. Answer the following :

A) Solve the non linear programming problem using Kuhn Tucker conditions **8**

Max $Z = 10x_1 + 4x_2 - 2x_1^2 - x_2^2$

Subject to the constraints

$2x_1 + x_2 \leq 5$, $x_1 x_2 \geq 0$

B) Write short notes on : **6**

i) Time-cost Trade off procedure

ii) Slack and Surplus variable.

7. Answer the following :

A) Give the computational procedure of Big-M method. **9**

B) Define Matroid with an example. **5**

SLR-MM – 224

Seat No.	

M.Sc. – II (Semester – III) (Old CGPA) Examination, 2015
COMPUTER SCIENCE (Paper – IX)
Java Programming

Day and Date : Monday, 16-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 p.m.

N. B. : *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) An interface contains _____

a) Final variables b) Method declaration

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

2) The execution of an applet begins from the _____ method.

a) Start ( ) b) init ( )

c) paint ( ) d) begin ( )

3) _____ class cannot be a subclass in Java.

a) Abstract b) Final

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

4) Which of the method is an object class method ?

a) finalize ( ) b) wait ( )

c) equals ( ) d) All of these

5) Which of the following functionality provided by connection interface ?

a) Establishing connection

b) Transaction management

c) Monitoring database sessions

d) All of these

P.T.O.

6) _____ method is used to call stored procedure.
   a) Prepare call b) Prepared statement
   c) Statement d) Result set

7) Which of the following is characteristic of an interface ?
   a) An interface can extend other interfaces
   b) Methods in an interface always public
   c) Fields in an interface always static
   d) All of the above

8) _____ method is invoked if a character is entered.
   a) KeyPressed ( ) b) KeyReleased ( )
   c) KeyTyped ( ) d) KeyEntered ( )

9) Which of the following package contains all the event handling interfaces ?
   a) java.lang b) jawa.awt
   c) java.awt.event d) java.event

10) _____ class implements an event listener interface and defines all its methods with empty body.
   a) Adapter b) Abstract
   c) Final d) Static

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

1) Super Keyword is used to avoid method overriding.
2) String class represents fixed length and immutable character sequences.
3) You can overide main ( ) method.
4) A key event is generated when keyboard input occurs.

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

i) JVM
ii) Garbage collection.

B) Answer the following : **6**

i) Differentiate between an interface and an abstract class.
ii) Give the disadvantages of an array.

3. A) What is the use of Layout managers ? Explain Layout manager in detail. **7**

   B) What is synchronization and explain with suitable example. **7**

4. A) What is Adapter class ? Explain any one with suitable example. **7**

   B) Create a windows application for adding a new record using JDBC. **7**

5. A) Define package. Explain how to create and import the package. **7**

   B) Distinguish between :

      i) Inputstream and Reader classes

      ii) Outputstream and Writer classes. **7**

6. A) What is AWT ? Explain various components of AWT. **7**

   B) Explain the steps involved in the applet development with the help of a program. **7**

7. A) What is the role of throw keyword ? Explain in detail. **7**

   B) Explain the various types of inheritance in Java.

SLR-MM – 225

Seat No.	

M.Sc. (Part – II) (Sem. – III) Examination, 2015
COMPUTER SCIENCE (Old, CGPA)
Paper – X : Artificial Intelligence

Day and Date : Wednesday, 18-11-2015 Max. Marks : 70

Time : 2.30 p.m. to 5.00 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) Natural language processing, perception, commonsense reasoning falls under_____ domain of Artificial Intelligence.
A) Critical tasks B) Scheduled tasks
C) Mundane tasks D) Special tasks

2) Specify one or more states within that space that describes possible situations from which the problem solving process may start. These states are called the
A) Goal states B) Conditional states
C) Ignorable states D) Initial states

3) The _____ algorithm is a depth first search procedure since complete solution must be generated before they can be tested.
A) A* search B) Generate and Test
C) AO* search D) None of these

4) Attribute _____ used to show class inclusion and provide the basis for property inheritance as an inference technique.
A) *instance* B) *hasa* C) *wasa* D) *isa*

5) The statement : *All slaves were either loyal to master or hated him*. Can be represented using predicate logic as
A) $\forall$ x *: Master(y)* $\rightarrow$ *loyalto (Master, y)* V *hate (x, slaves)*
B) $\forall$ x *: Slave(x)* $\rightarrow$ *loyalto (x, Master)* V *hate (x, Master)*
C) $\forall$ x *: Master(x)* $\rightarrow$ *loyalto (x, slaves)* V *hate (x, slaves)*
D) $\forall$ x *: Slave(y)* $\rightarrow$ *loyalto (y, Master)* V *hate (slaves, y)*

P.T.O.

6) _____ from the initial states; begin building a tree of move sequences that might be solutions by starting with the initial configuration at the root of the tree.

A) Reason forward B) Reason backward

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

7) _____ measures the extent to which the evidence supports hypothesis. It is zero if the evidence fails to support hypothesis.

A) Measure of disbelief B) Measure of belief

C) Measure of hypothesis D) Measure of evidence

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

A) Semantic net B) Conceptual dependency

C) Frames D) Script

9) In _____ step, the structures created by the syntactic analyzer are assigned meanings.

A) Anamorphic analysis B) Software analysis

C) Semantic analysis D) Discourse integration

10) The _____ procedure is a depth-first, depth-limited search procedure.

A) Heuristic search B) Depth first search

C) Best first search D) Minimax search

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

1) A ridge is a state that is better than all its neighbors but is not better than some other states farther away.

2) Fuzzy set theory allows us to represent set membership as a possibility distribution.

3) The primitive act such as transfer of the physical location of an object (e.g. go) can be denoted by ATRANS.

4) A procedural representation is one in which the control information that is necessary to use the knowledge is considered to be embedded in the knowledge itself.

2. A) Write short notes on following : **8**
   1) Generate and Test
   2) Matching

   B) Answer the following : **6**
   i) Differentiate between declarative versus procedural knowledge.
   ii) What do you mean by script ? Justify it in brief.

3. Answer the following :
   A) Define Heuristic search technique. Explain Hill climbing with its variants in detail. **7**
   B) Define Production system. Explain in detail using control strategy how to decide which rule to apply next during the process of searching for solution of problem ? **7**

4. Answer the following :
   A) State and explain in detail various approaches to knowledge representation. **7**
   B) Discuss in detail steps involved in Natural Language Processing. **7**

5. Answer the following :
   A) State and explain in detail probability and Bayes theorem. Summarize certainty factors. **7**
   B) Define Game playing. Explain in detail Alpha-Beta cutoffs with suitable example. **7**

6. Answer the following :
   A) Define Artificial Intelligence. Discuss various task domains in artificial intelligence. **7**
   B) Define Semantic Net. Discuss semantic net as weak slot and filler structures. **7**

7. Answer the following :
   A) Define Expert System. State and explain components of expert system shell. **7**
   B) Discuss conceptual dependency as a strong slot and filler structures. **7**

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SLR-MM – 226

Seat No.	

M.Sc. (Computer Science) (Part – II) (Semester – III) Examination, 2015
(CGPA Old)
MOBILE COMPUTING (Paper – XI)

Day and Date : Friday, 20-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 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) IMSI number consists of
   a) Mobile Country Code b) Mobile Network Code
   c) MSIN d) All of the above

ii) This Handles IWF (interworking Function) for interworking with public data network for data call service.
   a) BTS b) GMSC
   c) MSC d) GPS

iii) In medium access control layer of IEEE 802.11 to provide asynchronous data service which function is used ?
   a) PCF b) DCF
   c) MAC d) None of the above

iv) The core concept used in cellular technology is
   a) DM b) Frequency Reuse
   c) Code reuse d) None of the above

v) In phase shift keying, the synchronization is performed by
   a) Frequency synthesizer b) Guard space
   c) Phase Lock Loop d) Phase Synchronizer

vi) The type of access used in narrow band analog radio system
   a) FDMA/TDMA b) FDMA
   c) CDMA d) ALL

P.T.O.

vii) Which of the following algorithm is used for authentication in GSM ?

a) A1 b) A3

c) A5 d) A8

viii) TIM is list of _____ stations.

a) Uni-cast b) Broadcast

c) Multicast d) b) and c) both

ix) _____ splits the TCP connection into two connections.

a) Classical TCP b) I-TCP

c) M-TCP d) Snooping TCP

x) BSS in IEEE 802.11 infrastructure based wireless LAN stands for

a) Base Station Subsystem

b) Base Station Services

c) Basic Service Set

d) Basic Station Services

B) Fill in the blanks or **true/false** : **4**

i) Moving between access points is called _____

ii) FDD stand for _____

iii) Mobility itself can cause packet loss.

TRUE/FALSE

iv) All real antennas exhibit non-directive effects

TRUE/FALSE

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

i) Classical TCP

ii) PSK.

B) Answer the following : **(3+3)**

i) Discuss about mobile TCP.

ii) Explain slotted aloha.

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

   A) Explain cellular system components with neat diagram.

   B) Explain the system architecture of GSM.

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

   A) What is spread spectrum ? Discuss it in detail.

   B) What are the main reasons for using cellular system ? And also describe the dynamic channel allocation in cellular system.

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

   A) How the problem of hidden and exposed terminal is solved using MACA ?

   B) What is handover ? Explain its types with diagram.

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

   A) Describe indirect TCP and snooping TCP.

   B) Discuss in detail the Mobile Terminated Call scheme with diagram.

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

   A) Explain the format of an IEEE 802.11 frame of DSSS.

   B) How can DHCP be used for client initialization process ?

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SLR-MM – 227

Seat No.	

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

Day and Date : Monday, 23-11-2015 Max. Marks : 70

Time : 2.30 p.m. to 5.00 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) If in a Markov Chain of two states j and k with one step transition probabilities $p_{jj} = 0$, $p_{kj} = 1$ then value of $p_{kk}^{(3)}$ is

a) 0.5 b) 2 c) 0 d) 1

ii) If a 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

iii) In M/M/1:∞/FCFS Queue model if λ is mean customer arrival rate an μ is mean service rate then the probability of server being stand idle is equal to _____.

a) $\frac{\lambda}{\mu}$ b) $1 - \frac{\lambda}{\mu}$ c) $1 - \frac{\mu}{\lambda}$ d) $\frac{\mu}{\lambda}$

iv) A manufacturer has to supply his customers 600 units of his product per year. Shortages are not allowed and the storage cost amounts to Rs. 0.60 per unit per year. The set up cost per order is Rs. 80. The optimal number of orders n is_____ per year.

a) 3 b) 2 c) 1 d) 1.5

P.T.O.

v) What will be the corresponding random observation generated on continuous uniform distribution over (0,15) when a random number generated between 0 and 1 is 0.1 ?

a) 1.5 b) 0.15 c) 22.5 d) 15.15

vi) X is a binomial variate with parameters (n, p). If n = 1, the distribution of X reduces to

a) Bernoulli distribution b) Geometric distribution

c) Poisson distribution d) Discrete uniform distribution

vii) As a simulation is not an analytical mode, therefore, result of simulation must be viewed as

a) simplified b) exact c) unrealistic d) approximation

viii) In Monte-Carlo simulation

a) Randomness is the key requirement

b) The model is of deterministic nature

c) Random numbers can be used to generate the value of input variables only, if the sampled distribution is uniform

d) None of the above

ix) When there are more than one servers, customer behaviour in which he moves from one queue to another is

a) balking b) reneging c) jockeying d) alternating

x) The objective of network analysis is to

a) Minimize total project cost

b) Minimize total project duration

c) Minimize production delays, interruption and conflicts

d) All of the above

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

i) The long form of CPM is _____.

ii) In queue model completely specified in the symbolic form (a/b/c):(d/e), the third symbol c specifies _____.

iii) The time gap between placing of an order and its actual arrival in the inventory is known as _____.

iv) Simulation of systems in which the state changes abruptly at discrete points in time are called _____.

2. A) i) Define continuous uniform distribution. State its cumulative distribution function. **4**

ii) Let $\{X_n, n \geq 0\}$ be a Markov Chain with three states 0, 1, 2 and with one step transition matrix

$$P = \begin{pmatrix} 3/4 & 1/4 & 0 \\ 1/4 & 1/2 & 1/4 \\ 0 & 3/4 & 1/4 \end{pmatrix}$$ and the initial distribution $P(X_0 = i) = \frac{1}{3}$ for $i = 0, 1, 2$

Find i) $P(X_2 = 0, X_1 = 1, X_0 = 2)$ ii) $P(X_3 = 2, X_2 = 1 / X_1 = 1)$ **4**

B) i) Define Geometric distribution and find the P (X = 3) if X follows Geometric distribution with parameter P = 0.45 **3**

ii) What do you mean by movement inventories ? **3**

3. A) Explain objectives of Scientific Inventory Control. **7**

B) A project schedule has the following activities and the time (in weeks) of completion of each activity is as follows :

Activity	1-2	2-3	2-5	3-4	3-5	4-5
Time	5	15	8	15	6	10

Draw the network diagram and find the minimum time of completion of the project, slack times for each activity and critical path. **7**

4. A) What are the advantages and limitations of using simulation ? **7**

   B) Solapur Bakery keeps stock of a popular brand of cake. Previous experience indicates the daily demand as given here :

Daily Demand	0	10	20	30	40	50
Probability	0.02	0.25	0.10	0.40	0.22	0.01

   Consider the following sequence of random numbers :
   0.18, 0.68, 0.29, 0.11, 0.56, 0.79, 0.05, 0.34, 0.58, 0.09.

   Using this sequence, simulate the demand for the next 10 days. Find out the stock situation if the owner of the bakery decides to make 25 cakes every day. Also estimate the daily average demand for the cakes on the basis of simulated data. **7**

5. A) Give the rules for constructing the network diagram in network analysis. **7**

   B) Generate a random sample of size 5 from binomial distribution with parameters n = 1 and p = 0.51 using the sequence of random numbers 0.2261, 0.9907, 0.5053, 0.7470, 0.3864. **7**

6. A) Explain briefly the important characteristics of queueing system. **7**

   B) Generate a random sample of size 5 from exponential distribution with mean 2 using the sequence of random numbers 0.472, 0.85, 0.294, 0.999, 0.423. **7**

7. A) Give the steps of Monte-Carlo simulation technique. **7**

   B) Explain generation of a random sample from Normal distribution. **7**

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SLR-MM – 228

Seat No.	

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

Day and Date : Tuesday, 17-11-2015 Total Marks : 70
Time : 2.30 p.m. to 5.00 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) LAN stands for _____

A) Large Area Network B) Local Area Network

C) Long Area Network D) Lower Area Network

2) A _____ is a collection of independent computers that appears to the system as a single computer.

A) Centralized System B) Personal Computer System

C) Distributed System D) Operating System

3) All distributed systems are _____

A) SISD B) SIMD C) MISD D) MIMD

4) ISO stands for _____

A) International Organization for Standardization

B) International Standard Organization

C) International Standard Operation

D) Important Standard Operation

5) In a _____ (loosely coupled) system, the processors do not share memory or a clock.

A) Multiprocessor B) Distributed

C) Remote D) Local

6) _____ communication is from one sender to multiple receivers.

A) Many to one B) Many to many

C) One to many D) One to one

7) When a packet is sent to an address, it is automatically delivered to all machines listening to the address. This technique is called _____

A) Unicasting B) Broadcasting

C) Multicasting D) Point to point transmission

8) When a system has 'n' computers, all 'n' crystals will run at slightly different rates, causing the clocks gradually to get out of sync and give different values when read out. This different in time values is called _____

A) Time skew B) Clock skew

C) Clock tick D) Time tick

9) The code placed around the system call to do the checking is called _____

A) Jacket B) Thread package

C) Mutex D) Upcall

10) A system that has the property of always responding to a message within a known finite bound if it is working is said to be _____

A) Asynchronous B) Acknowledgment

C) Synchronous D) Feedback

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

1) MPI and sockets are both transient models.

2) TCP does not provide reliable, in-order transfer of bytes between client and server.

3) A hypercube is an n-dimensional cube.

4) The DoD transport problem is called TCP.

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

i) Atomic Transaction

ii) RPC.

B) Answer the following : **6**

i) What do you mean by Windows NT and Novel Netware ?

ii) State the principle of Processor pool model.

3. Answer the following : **14**

   A) Enlist and explain in detail the various transparencies as the design issues for distributed systems.

   B) What do you mean by processor allocation ? Explain design issues for processor allocation algorithm in details.

4. Answer the following : **14**

   A) Explain in detail the various aspects and design issues for Group communication .

   B) Explain in detail Layered Protocol with necessary diagram.

5. Answer the following : **14**

   A) Define Mutual Exclusion. Explain election algorithms in detail.

   B) Define Operating systems. State and explain in detail the necessary conditions to occur a deadlock.

6. Answer the following : **14**

   A) Explain in detail the workstation model as the system model.

   B) Define Thread. Explain in detail the thread usage in terms of three organizations of it in a process.

7. Answer the following : **14**

   A) Explain in detail the download/upload and remote access model as the file service interface.

   B) What is false deadlock ? Explain the deadlocks in distributed system.

SLR-MM – 229

Seat No.	

M.Sc. – II (Semester – IV) Examination, 2015
COMPUTER SCIENCE (CGPA)
Data Mining and Warehouse (Paper – XIV)

Day and Date : Thursday, 19-11-2015 Max. Marks : 70

Time : 2.30 p.m. to 5.00 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 roll-up operation is also called

a) drill-down b) drill-up c) slice d) dice

2) Dimension data within a warehouse exhibits one of the following properties

a) Dimension data consists of the minor part of the warehouse

b) The aggregated information is actually dimension

c) It contains historical data

d) Dimension data is the information that is used to analyze the elemental transactions

3) The 'Slice' operation deals with

a) Selecting all but one dimension of the data cube

b) Merging the cells along one dimension

c) Merging the cells of all but one dimension

d) Selecting the cells of any one dimension of data cube

4) _____ which detects errors in the data and rectifies them when possible.

a) data cleaning b) data extraction

c) data transformation d) load

P.T.O.

5) The most common source of change data in refreshing a data warehouse is
   a) Queryable change data
   b) Cooperative change data
   c) Logged change data
   d) Snapshot change data
6) The _____ schema is a variant of the star schema model, where some dimension tables are normalized.
   a) star b) fact constellation
   c) snowflake d) none of these
7) A rule-based classifier uses a set of
   a) Do..while b) IF-THEN c) For d) None of the above
8) Prediction is
   a) The result of the application of a theory or rule
   b) One of several possible enters within a database table
   c) Discipline in statistics that studies ways of projections
   d) None of the above
9) A Business Intelligence system requires data from
   a) Data warehouse
   b) Operational systems
   c) All possible sources within the organization and possibly from external sources
   d) Web servers
10) In a data warehouse, if D1 and D2 are two conformed dimensions, then
   a) D1 may be an exact replica of D2
   b) D1 may be at a rolled up level of granularity compared to D2
   c) Columns of D1 may be a subset of D2 and vice versa
   d) Rows of D1 may be a subset of D2 and vice versa

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

1) _____ is the data defining warehouse objects.
2) In data warehousing literature, an n-D base cube is called a _____
3) The top most 0-D cuboid, which holds the highest-level of summarization, is called the _____
4) An _____ collects all of the information about subject spanning the entire organization.

2. A) Write short notes on the following : **8**
   i) Data Cleaning
   ii) DMQL

   B) Answer the following : **6**
   i) Explain data warehouse Back-end tools and utilities.
   ii) What is prediction ? Explain in short.

3. Answer the following :
   A) What is data warehouse ? Explain difference between OLTP and OLAP. **8**
   B) Explain various data mining applications. **6**

4. Answer the following :
   A) Explain Apriori algorithm with suitable example. **7**
   B) Explain decision tree algorithm in detail. **7**

5. Answer the following :
   A) What is data cube ? Explain different types of schemas for multidimensional database. **6**
   B) What is Binning ? Give any two strategies used while binning. **8**

6. Answer the following :
   A) What is cluster analysis ? What are the requirements and general applications of clustering in data mining ? **8**
   B) Give the characteristic property of K-means. **6**

7. Answer the following :
   A) Explain Trends in data mining. **8**
   B) How does backpropagation work ? **6**

SLR-MM – 230

Seat No.	

M.Sc. – II (Semester – IV) Examination, 2015
COMPUTER SCIENCE (CGPA)
Digital Image Processing (Paper – XV)

Day and Date : Saturday, 21-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 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) Ultrasound is an application which use _____
   a) Microwave band b) Radio wave band
   c) Acoustic imaging d) None of the above

2) An image of size 10×10 pixels formed with 16 gray levels need _____ bytes of storage space.
   a) 50 b) 200 c) 400 d) 1600

3) D_4 distance is always _____ Euclidean distance.
   a) Less than b) Less than or equal to
   c) Greater than d) Greater than or equal to

4) The power-law transform will convert to _____ when $\gamma = 1$.
   a) Identity transform b) Negative transform
   c) Piece-wise linear transform d) Log transform

5) The phase angle of a Fourier spectrum is given by _____
   a) $\tan\left(\frac{I(u)}{R(u)}\right)$ b) $\tan\left(\frac{R(u)}{I(u)}\right)$ c) $\tan^{-1}\left(\frac{I(u)}{R(u)}\right)$ d) $\tan^{-1}\left(\frac{R(u)}{I(u)}\right)$

6) Which of the following PDF is useful for images with skewed histograms ?
   a) Gaussian noise b) Uniform noise
   c) Exponential noise d) Rayleigh noise

P.T.O.

7) For an object A with a structuring element B, $(A \oplus B) - (A \square B)$, _____
   a) Produces inner boundary of object
   b) Produces outer boundary of object
   c) Produces inner and outer boundary of object
   d) Removes inner boundary of object

8) In region splitting and merging technique two adjacent regions R and S are merged if
   a) $P(R \cup S) = True$
   b) $P(R \cup S) = False$
   c) $P(R \cap S) = True$
   d) $P(R \cap S) = False$

9) The four directional chain code of an object is 030033212211. Its shape number is _____
   a) 0330310330331
   b) 0303310330331
   c) 0330330133033
   d) 0330301330331

10) In the minimum distance classifier the bisector of two groups of objects using three types of features is a _____
   a) Line
   b) Curve
   c) Plane
   d) Hyper plane

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

1) Digitization of co-ordinate values of an image is called as _____
2) If we consider the bit planes of an image then _____ bits contain the majority of the visually significant data.
3) Butterworth low-pass filter is given by equation _____
4) The Eular formula for a region containing A number of edges, B number of vertices, C number of faces, D number of holes and E number of connected components is _____

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

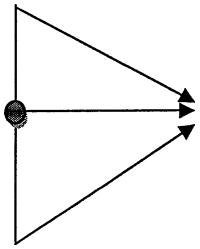
i) Different ways to measure distances between pixels.
ii) Local processing for edge linking.

B) Answer the following : **6**

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

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

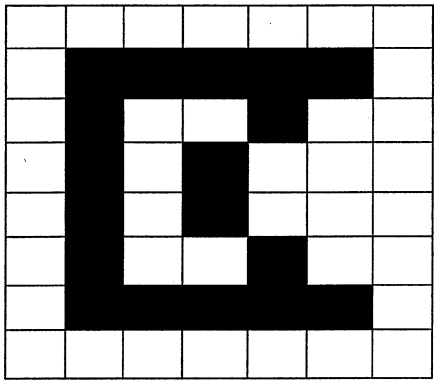
A) Discuss histogram equalization.

B) Dilate a rectangle of width 8 cm and height 4 cm using a circle of 1 cm radius and a triangle with base and height 1 cm.

4. Answer the following : **14**

A) How smoothing and sharpening spatial filters differ ? Explain with examples.

B) Fill the following region using morphological region filling algorithms.



5. Answer the following : **14**

   A) Explain adaptive filter used for local noise reduction.

   B) Compute the covariance matrix for the following vectors :

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

6. Answer the following : **14**

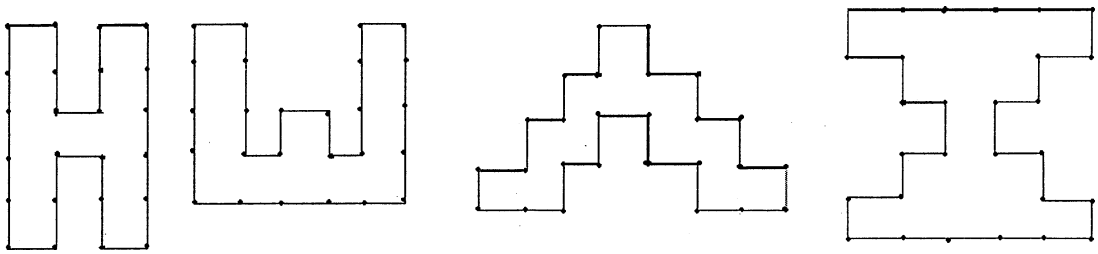
   A) Discuss hit-or-miss transform using an example.

   B) The two classes of objects denoted by ω_1, and ω_2 have sample mean vectors $m_1 = (4, 2, 3)$, and $m_2 = (8, 5, 7)$ respectively. Compute decision boundary between these two objects.

7. Answer the following : **14**

   A) Explain linking of edges using global processing technique.

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



(a) (b) (c) (d)

SLR-MM – 231

Seat No.	

M.Sc. II (Semester – IV) Examination, 2015
(CGPA)
Paper – XVI : .NET
Computer Science

Day and Date : Tuesday, 24-11-2015 Max. Marks : 70
Time : 2.30 p.m. to 5.00 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) Each question below gives a multiple choice of answers, choose the most appropriate **one** : **10**

1) In generics, _____ method returns the next object to come off of a stack or queue.
a) POP b) PUSH c) PEEK d) DELETE

2) _____ can't depend on stability.
a) Delegate b) Constructor
c) Finalizers d) Object

3) _____ operator used to implement interface.
a) Colon b) Binary c) Ternary d) Unary

4) _____ are libraries of classes that are in the list of references.
a) Class b) Assemblies
c) Manifest d) Namespace

5) _____ means public only to the other classes in assemblies.
a) Partial b) Internal
c) Transient d) Public

6) _____ says that this class can't be subclassed.
a) Final b) Static c) Sealed d) Public

P.T.O.

7) Every method in an interface is an _____ method.
   a) abstract b) constant c) private d) final

8) A generic _____ resizes dynamically to whatever size is needed.
   a) List b) Array c) Enum d) Iterator

9) _____ is a static method of Array class that turns an array backwards.
   a) Reverse b) reverseArray
   c) readReverse d) readBack

10) _____ are best for storing data but lack of inheritance.
   a) Class b) Interface
   c) Enums d) Structs

B) State following statements are **true** or **false** : **4**

1) A switch statement compares one variable against multiple possible values.
2) Extension method are always static methods.
3) .NET classes are sealed.
4) Object is cosmic super class of all classes.

2. A) Write short notes on the following : **8**
   i) Base Class Libraries
   ii) CLR Execution Engine.

   B) Answer the following : **6**
   i) Explain the classification of Types in .NET Framework.
   ii) Explain the memory representation for unboxing and boxing of value types.

3. Answer following :

   A) Explain two components of Assemblies. **7**

   B) What is global.aspx ? Explain its advantages and disadvantages. **7**

4. Answer the following :

   A) Explain how destructor and garbage collector works in C#. **7**

   B) Differentiate between ADO and ADO.NET. **7**

5. Answer following :

   A) What is Abstract Class ? Explain how 'Has-a' relationship is achieved in C# with suitable example. **7**

   B) What is inheritance ? Explain how inheritance is restricted in C#. **7**

6. Answer following :

   A) Explain the life cycle of webpage. **7**

   B) What is postback ? Explain the significance of postback property. **7**

7. Answer following :

   A) Explain the use of *Request, Response, Session* and Application Objects. **7**

   B) What is connection pooling ? Describe *DataSets, DataAdapters* and *DataTable* in brief. **7**
