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**M.Sc. (Part – I) (Semester – I) (New CBCS) Examination, 2016
COMPUTER SCIENCE**

Object Oriented Programming Using C++ (Paper – I)

Day and Date : Tuesday, 29-3-2016

Max. Marks : 70

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

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

1. A) Choose the correct alternatives : 10
- 1) Where does the execution of the program starts ?
A) Main function B) User-defined function
C) Void function D) None of these
 - 2) Which is more effective while calling the functions ?
A) Call by value B) Call by pointer
C) Call by reference D) None of these
 - 3) What is the scope of the variable declared in the user defined function ?
A) Whole program B) Only inside the { } block
C) Both A) and B) D) None of these
 - 4) Which keyword is used to declare the friend function ?
A) Firend B) Myfriend C) Classfriend D) Friend
 - 5) What is default visibility mode for members of classes in C++ ?
A) Private B) Public C) Protected D) None of these
 - 6) Which of the following operator is overloaded for object cout ?
A) >> B) << C) + D) =
 - 7) A template can be considered as a kind of
A) Micro B) Macro C) Maxcro D) None of these
 - 8) Where can the default parameter be placed by the user ?
A) Leftmost B) Rightmost C) Both A) and B) D) None of these
 - 9) _____ are run time anomalies or unusual conditions that a program may encounter while executing.
A) Template B) Virtual Function
C) Exception D) None of these
 - 10) _____ operator cannot overload.
A) + B) – C) << D) ?:



- B) State whether following statement is **true** or **false** : **4**
- 1) You can use C++ as a procedural, as well as an object-oriented, language.
 - 2) Constructors are invoked automatically when the objects are created.
 - 3) A class can be derived from another derived class is called multiple inheritance.
 - 4) A virtual function can be friend of another class.
2. A) Attempt the following questions : **8**
- i) What are the advantages of OOPs ?
 - ii) What do you mean by user defined data types ? Explain with example.
- B) Write a short note on following : **6**
- i) Inline function
 - ii) Scope resolution operator
3. Attempt the following questions. **14**
- A) What is arrays of objects ? Explain with suitable example.
 - B) What is constructor ? Explain parameterized constructor with example.
4. Attempt the following questions : **14**
- A) What is function overloading ? Explain with suitable example.
 - B) Write a C++ program to overload unary minus operator.
5. Attempt the following questions. **14**
- A) What is virtual function ? Explain the rules for virtual functions.
 - B) Write a program to implement a sphere class with appropriate members and member function to find the surface area and the volume.
(Surface = $4 \pi r^2$ and volume = $\frac{4}{3} \pi r^3$)
6. Attempt the following questions. **14**
- A) What is template ? Explain function template.
 - B) Write a C++ program to demonstrate single inheritance.
7. Attempt the following questions. **14**
- A) What is manipulator ? Explain width(), precision() and fill() manipulators with example.
 - B) What is friend function ? Explain it with example.
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M.Sc. – I (Semester – I) (CBCS) (New) Examination, 2016
COMPUTER SCIENCE
Paper – II : Numerical Analysis

Day and Date : Thursday, 31-3-2016

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 012.56×10^4 has _____ significant digits.
a) 3 b) 4 c) 5 d) 6
- ii) The next iterative value of the root of $x^2 - 4 = 0$ using Newton-Raphson method, if the initial guess is 3, is
a) 1.5 b) 2.067 c) 2.167 d) 3.000
- iii) The finite difference $y_1 - y_0$, where $y_i = f(x_i)$, is denoted by
a) Δy_0 b) ∇y_0 c) $\delta y_{3/2}$ d) none of these
- iv) If $X = 0.51$ and is correct to 2 decimal places, then $\Delta X =$
a) 0.001 b) 0.002 c) 0.005 d) 0.05
- v) 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
- vi) A square matrix A is upper triangular if
a) $a_{ij} = 0, j > i$ b) $a_{ij} = a, i > j$
c) $a_{ij} \neq 0, j > i$ d) $a_{ij} \neq 0, i > j$



- vii) Polynomials are the most commonly used functions for interpolation because they are easy to
- a) evaluate b) differentiate c) integrate d) all of these
- viii) Interpolation means estimating a value which lies
- a) within the given range of arguments
 b) outside the given range of arguments
 c) outside the range of the dependent variable
 d) none of these
- ix) $y'' + 3y' = 2y + x^2$ is a _____ differential equation.
- a) second-order, linear b) second-degree, linear
 c) first-order, linear d) second-order, nonlinear
- x) In composite Simpson's $\frac{1}{3}$ rule the number of segments n must be
- a) any positive integer b) an odd number
 c) an even number d) multiple of 3

B) Fill in the blanks :

4

- i) If $\nabla y_2 = 4$ and $\nabla^2 y_2 = 4$ then $\nabla y_1 = 1$.
- ii) The false position method is also called as Secant method in Latin.
- iii) The first phase of Gauss elimination method is Forward elimination phase.
- iv) Mathematical models which use differential calculus to express relationship between variables are known as differential equations.

2. A) i) Define an absolute error.

Three approximate values of the number $2/3$ are given as 0.60, 0.66 and 0.67. Verify which of these three is the best approximation.

4

ii) Define the operators Δ , ∇ and E. Show that $\Delta = E\nabla$.

4

B) i) State Taylor's series for a function of several variables.

3

ii) Given $a = 10.00 \pm 0.05$, $b = 0.0356 \pm 0.0002$ and $c = 15300 \pm 100$ find the maximum value of the absolute error in $a + b - c$.

3



- 3. A) Write a note on the iteration method of finding the root of $f(x) = 0$ and its rate of convergence. 7
- B) From the following information find $f(306)$ using Newton's divided difference formula. 7

x	300	304	305	307
f(x)	2.4771	2.4829	2.4843	2.4871

- 4. A) Describe Gauss-Seidel method. 7
- B) Find the value of $\sqrt{10}$ by using Newton-Raphson method and compare it with the value resulted on calculator. 7
- 5. A) Write a note on Taylor's series method of finding solution of differential equation. 7
- B) Solve the following system of equations using Gauss elimination technique.
 $2x_1 + 2x_2 + x_3 = 6, 4x_1 + 2x_2 + 3x_3 = 4, x_1 - x_2 + x_3 = 0.$ 7

- 6. A) Explain LU Decomposition method for finding solution of a system of linear equations. 7
- B) From the following table, find the area bounded by the curve $f(x)$ and the x-axis from $x = 7.47$ to $x = 7.52$ by using suitable rule. 7

x	7.47	7.48	7.49	7.50	7.51	7.52
y = f(x)	1.93	1.95	1.98	2.01	2.03	2.06

- 7. A) Describe Simpson's $\frac{1}{3}$ rule. 7
- B) Given the equation
 $\frac{dy}{dx} = xy$ with $y(0) = 1$
Estimate $y(0.4)$ by Euler's method using $h = 0.1$. 7



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M.Sc. – I (Semester – I) (New CBCS) Examination, 2016
COMPUTER SCIENCE (Paper – III)
Software Engineering

Day and Date : Saturday, 2-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

Instructions : 1) Question 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) In the maintenance phase the product must be tested against previous test cases. This is known as _____ testing.
a) Unit b) Integration c) Regression d) Beta
 - 2) Which is not a software life cycle model ?
a) Spiral Model b) Waterfall Model
c) Prototyping Model d) Capability Maturity Model
 - 3) A computer program can be very satisfactory _____ of a physical system such as road traffic conditions.
a) Solution b) Replacement
c) Simulation d) Model
 - 4) Design phase includes
a) Data, architectural and procedural designs only
b) Data, architectural, interface and procedural designs only
c) Data, architectural and interface designs only
d) Architectural, procedural and interface designs only
 - 5) Data flow diagram is
a) The modern version of flowchart
b) Mainly used at the system specification stage
c) The primary output of the system design phase
d) All of the above



- 6) Objects have _____ in object oriented design of software.
 - a) Attributes, name and operations
 - b) Attributes and name
 - c) Operations and name
 - d) None of the above
- 7) The system should provide _____ thing, to avoid error in transcription and transposition, during data entry.
 - a) A check digit
 - b) A hand totals
 - c) Batch totals
 - d) All of these
- 8) Testing can
 - a) Never be exhaustive
 - b) Can be exhaustive
 - c) Can always find the bug
 - d) None of the above
- 9) RAD is a linear sequential software development process model. RAD is an acronym for
 - a) Rapid Application Development
 - b) Rapid Action Development
 - c) Rough Application Development
 - d) Rough Action Development
- 10) Spiral Model was developed by
 - a) Berry Bohem
 - b) Roger Pressman
 - c) Victor Bisili
 - d) Bev Littlehood

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

4

- 1) A data dictionary should be established and used to define both data and program design.
- 2) In object oriented design an object can belong to two classes.
- 3) The goal of interface design is to define a set of interface objects and actions that enable a user to perform all defined tasks in a manner that meets every usability goal defined for the system.
- 4) Evolutionary development usually comes in two flavours; exploratory development and throw-away prototyping.

2. A) Write a short note :

8

- A) Transform and Transaction mappings.
- B) Procedural design.

B) Answer the following :

6

- a) What are the limitations of waterfall model ?
- b) Why software doesn't wear out ?



3. Answer the following :
 - A) With appropriate block diagram explain briefly the requirement engineering process. 7
 - B) Discuss the difference between black box and white box testing models. 7

 4. Answer the following :
 - A) Explain in detail RAD model. 7
 - B) Explain in detail the design concepts. 7

 5. Answer the following :
 - A) Explain top-down approach used in integration testing. 7
 - B) What are functional and non-functional requirements ? Explain in detail. 7

 6. Answer the following :
 - A) What are the elements of analysis model ? Explain. 7
 - B) Explain the steps involved in prototyping model. 7

 7. Answer the following :
 - A) What is problem analysis ? Explain the model to problem analysis. 7
 - B) Explain software characteristics and its components. 7
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M.Sc. (Part – I) (Semester – I)(New-CBCS) Examination, 2016
COMPUTER SCIENCE (Paper – IV)
Data Structures

Day and Date : Tuesday, 5-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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) Which of the following case does not exist in complexity theory ?
a) Best case b) Worst case c) Average case d) Null case
 - 2) The operation of processing each element in the list is known as
a) Sorting b) Merging c) Inserting d) Traversal
 - 3) Which of the following data structure can store the homogeneous data elements ?
a) Records b) Pointers
c) Arrays d) None of the above
 - 4) When a data are to be deleted from a data structure, but START = NULL ; this situation is usually called
a) Overflow b) Houseful c) Saturated d) Underflow
 - 5) The sort that follows divide and conquer strategy is
a) Insertion sort b) Selection sort c) Merge sort d) Bubble sort
 - 6) The _____ data structure has only one end to perform insertion and deletion of element into and out of it respectively.
a) Tree b) Linked List c) Stack d) Queue
 - 7) Dijkstra’s shortest path algorithm is “greedy” in the sense that it always chooses the _____ to the source among those whose shortest path is not yet known.
a) Longest Vertex b) Node Vertex
c) Furthest Vertex d) Closest Vertex



- 8) A _____ is a single byte data type and that is capable of holding one character in the local character set.
- a) String b) Character c) Char d) Single Character
- 9) The length of the longest road from the root node to one of the terminal nodes is what we call the _____ of a tree.
- a) Size b) Height c) Length d) Width
- 10) ASCII uses _____ character code so characters may be viewed as “digits”.
- a) 8-Byte b) 8-Bit c) 7-Bit d) 7-Byte

B) State True or False. 4

- 1) Stack data structure is not a linear data structure.
- 2) The form of a dynamic programming 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) Queue data structure has variant that can be used solve arithmetic expression.
- 4) Singly Linked List can be represented by using the first field of each cell to point to the left child and the second field to point to the right child.

2. A) Write a short notes. 8

- i) Doubly Linked List.
- ii) Sparse Matrix.

B) Answer the following. 6

- i) Briefly explain Priority Queue.
- ii) What do you mean Data Structure ?

3. Answer the following.

A) What do you mean by sorting ? State and perform insertion sort algorithm to sort following numbers in ascending order. 7

78, 55, 13, 105, 48, 23, 149, 65, 99, 28, 86, 66, 35, 8

B) Define the term Tree. Discuss the Breadth First Search algorithm for tree traversing with suitable example. 7



4. Answer the following.

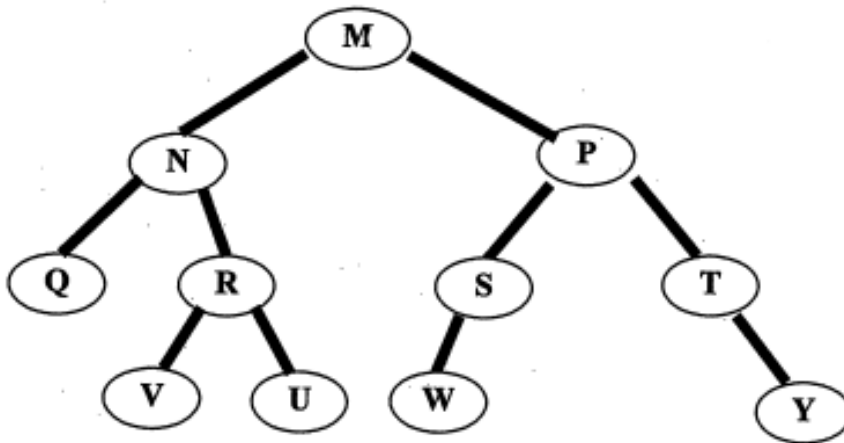
- A) What do you mean by Linked List ? Explain in detail data element insertion and deletion operation in the Circular Linked List with suitable example. 7
- B) What do you mean by stack ? Explain detail the solution for Tower of Hanoi having three disks and three pegs. 7

5. Answer the following.

- A) What do you mean by Data type ? Explain in detail the concept of Primitive and Composite data type. 7
- B) State and Illustrate the algorithm for the conversion of infix arithmetic expression into postfix expression using stack on given expression. 7
 $P + (B + R) * (S / V - Z) - L * M.$

6. Answer the following.

- A) Discuss in detail the concept of Array as the data structure with suitable example. 7
- B) Define the term Binary tree. Illustrate the process and result of Pre-Order, In-Order and Post-Order traversing on given tree. 7



7. Answer the following.

- A) What do you mean by Dequeue ? Explain in detail operation of insertion and deletion on Dequeue with suitable example. 7
- B) Discuss in detail meaning of Backtracking and its mechanism with suitable example. 7



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M.Sc. (Part – I) (Semester – I) Examination, 2016
COMPUTER SCIENCE (Old)(CGPA)
Numerical Analysis (Paper – II)

Day and Date : Thursday, 31-3-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- 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) The rate of convergence of Bisection method is
- a) Linear
 - b) Faster than linear but slower than quadratic
 - c) Quadratic
 - d) Cubic
- ii) Simpsons one third rule is obtained by taking $n = \underline{\hspace{2cm}}$ in general quadrature formula.
- a) 1
 - b) 2
 - c) 3
 - d) 4
- iii) The Trapezoidal rule applied to $\int_1^3 f(x)dx$ gives the value 8 and Simpson's rule gives the value 4. What is $f(2)$?
- a) 2
 - b) 0
 - c) 1
 - d) 3
- iv) Gauss-Siedel method used for $\underline{\hspace{2cm}}$
- a) Integration
 - b) Root finding
 - c) Solution of system of linear equations
 - d) All of the above
- v) The convergence in modified Euler's method is $\underline{\hspace{2cm}}$ than that of Euler's method.
- a) Slower
 - b) Compatible
 - c) Faster
 - d) One time more

P.T.O.



- vi) Which of the following is true for backward difference operator ?
- $\nabla^2 f(x) = f(x - 2h) - 2f(x - h) + f(x)$
 - $\nabla^2 f(x) = f(x - 2h) + 2f(x - h) + f(x)$
 - $\nabla^2 f(x) = f(x - 2h) - 2f(x - h) - f(x)$
 - All of these
- vii) In interpolation, if x_0, x_1, \dots, x_n are $(n + 1)$ distinct value of real valued function $f(x)$, then
- One has a polynomial $p_n(x_i) \approx f(x)$ of degree n or more
 - One has a polynomial $p_n(x_i) \approx f(x)$ of degree n exactly
 - One has a polynomial $p_n(x_i) \approx f(x)$ of degree n or less
 - None of these
- viii) _____ method is not convergent always.
- Bisection
 - Regula Falsi method
 - Secant method
 - Simpson's rule
- ix) Let h be the finite difference, then which of the following is true for forward difference operator ?
- $\Delta^n f(x) = \sum_{r=0}^n (-1)^{n-r} {}^n C_r f(x + rh)$
 - $\Delta^n f(x) = \sum_{r=0}^n {}^n C_r f(x + rh)$
 - $\Delta^n f(x) = \sum_{r=0}^n (-1)^{n-r} f(x + rh)$
 - None of these
- x) In the Gauss-Elimination method for solving a system of linear algebraic equations, triangularization leads to
- Diagonal matrix
 - Upper triangular matrix
 - Lower triangular matrix
 - Singular matrix

B) State true or false :

4

- Eigen values of a matrix A are given by $|A - \lambda I| = 0$.
- Every diagonal matrix is triangular.
- The convergence of Newton-Raphson method is sensitive to starting value.
- The total number of arithmetic operations in Gaussian elimination method are n^2 .



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

- i) Regula -Falsi method.
- ii) Guass elimination method.

B) Answer the following : 6

i) Prove the following identity

$$\Delta \nabla y_k = \delta^2 y_k.$$

ii) Round off the number $\pi = 3.1415927$ to five significant figures and determine the associated absolute error and relative error.

3. A) Find a real root of equation $2x - 3 = \cos x$ by using iteration method correct upto 3 decimal places. 7

B) Show that, the convergence of the Newton-Raphson iteration is of order 2.

(i.e $\epsilon_{n+1} \propto \epsilon_n^2$). 7

4. A) Explain the LU decomposition method. 7

B) Solve the following equations by Gauss-Seidal method. 7

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

$$x - 8y + 3z = -4$$

$$2x + y + 9z = 12.$$

5. A) The following table gives the sales of Pentium of 'Info Tech. Company' for the last five years. Estimates the sales for year 1996 using Newton forward difference formula. 7

Year (x)	1991	1993	1995	1997	1999
Sales (y) (in billions of Rs.)	40	48	52	65	84

B) Explain the Trapezoidal rule. 7



6. A) Evaluate the integral $\int_0^{1.2} e^x dx$, by using Simpson's 3/8 rule and taking seven ordinates. **7**
- B) Use the modified Euler's method to solve the differential equation. **7**

$$\frac{dy}{dx} = x + y^2 \text{ with } y(0) = 1. \text{ Take the step size } h = 0.1.$$

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

$$\begin{bmatrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{bmatrix}$$

- B) Use Taylor's series method to solve the equation $\frac{dy}{dx} = 3x + y^2$ to approximate y when $x = 0.1$, given that $y = 1$ when $x = 0$. **7**
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**M.Sc. – I (Semester – I) (Old) (CGPA) Examination, 2016
COMPUTER SCIENCE
Paper – III : Software Engineering**

Day and Date : Saturday, 2-4-2016

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

Max. Marks : 70

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

1. A) Choose the correct alternatives. 10
- 1) _____ is concerned with development and maintenance of software products.
- a) Software Process b) Software Engineering
c) Computer Technology d) All of the above
- 2) _____ is an international standard for the evaluation of software quality.
- a) Produce, manage, acquire b) Modify and display the information
c) Product quality d) None of the above
- 3) The software life cycle is composed of _____ types of processes.
- a) 3 b) 5
c) 7 d) All of the above
- 4) A _____ is a working model that is functionally equivalent to a component of the product.
- a) Prototype b) Software
c) Software segment d) All of the above
- 5) Data modelling uses
- a) Entities b) Attributes
c) Both a) and b) d) None of the above



- 6) The _____ model is a realistic approach to the development of large scale systems and software.
- a) Spiral
 - b) Waterfall
 - c) both a) and b)
 - d) None of the above
- 7) PERT stands for
- a) Program Evaluation and Review Technique
 - b) Program Equation and Review Technique
 - c) Product Enterprise Resource Technique
 - d) All of the above
- 8) The _____ describes the data and control to be processed, function, interfaces, reliability, performance and constraints etc.
- a) Interface design
 - b) Software scope
 - c) Both a) and b)
 - d) All of the above
- 9) _____ measure is the solution of the drawback of SLOC size measure.
- a) Black-box testing
 - b) Token count
 - c) Both a) and b)
 - d) All of the above
- 10) According to the COCOMO, software projects are categorized into _____ types.
- a) 3
 - b) 5
 - c) 1
 - d) None of the above

B) Fill in the blanks or **true/false**.

4

- 1) Is RAD increases the development time.
- a) True
 - b) False
- 2) State transition diagram describes how the system behaves to external events.
- a) True
 - b) False
- 3) Black-box testing, also called behavioral testing.
- a) True
 - b) False
- 4) Verification refers to the set of activities that ensure that software correctly implements a specific function.
- a) True
 - b) False



2. A) Write short notes on the following : **8**
 i) Discuss qualities of software product.
 ii) Discuss evolutionary software process model.
B) Answer the following : **6**
 i) Explain analysis modelling in brief.
 ii) Explain software components.
3. Answer the following : **14**
A) Explain the RAD model phases.
B) Discuss software prototyping and specification.
4. Answer the following : **14**
A) Explain architectural design and process of software.
B) Explain software engineering design process.
5. Answer the following : **14**
A) Explain the control structure testing with example.
B) Explain the elements of an object model.
6. Answer the following : **14**
A) Differentiate Black Box and White Box testing.
B) Portray software testing strategies.
7. Answer the following : **14**
A) Explain software quality assurance.
B) Explain software design principles.
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M.Sc. (Part – I) (Semester – I) Examination, 2016
(Old CGPA)
COMPUTER SCIENCE
Paper – IV : Data Structure

Day and Date : Tuesday, 5-4-2016

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 3 to 7.
 - 3) Figures to the **right** indicate **full** marks.

1. A) Choose the correct alternatives :

10

- 1) Which of the following data structure are indexed structures ?
 - a) Linked list
 - b) Linear arrays
 - c) Queue
 - d) None of the above
- 2) Which of the following is an external sorting ?
 - a) Insertion
 - b) Bubble sort
 - c) Merge sort
 - d) Tree sort
- 3) The insertion operation in stack is called
 - a) push
 - b) pop
 - c) insert
 - d) top
- 4) The operation of processing each element in the list is known as
 - a) sorting
 - b) merging
 - c) inserting
 - d) traversal
- 5) A _____ is linear list in which insertion and deletion are made from either end.
 - a) circular queue
 - b) random queue
 - c) priority
 - d) dequeue
- 6) Quick sort is also known as
 - a) Merge sort
 - b) Tree sort
 - c) Shell sort
 - d) Partition and exchange sort
- 7) A graph is said to be _____ if its edges are assigned data.
 - a) Sticked
 - b) Marked
 - c) Labeled
 - d) Tagged
- 8) In a binary trees nodes with no successor are called
 - a) Terminal node
 - b) Final nodes
 - c) Last node
 - d) End node

P.T.O.



- 9) The condition _____ indicate the queue is empty.
 a) front=null b) null=front c) front=rear d) rear=null
- 10) The time complexity of quick sort is
 a) $O(n)$ b) $O(n^2)$ c) $O(n \log n)$ d) $O(\log n)$
- B) State whether **true** or **false** : 4
- 1) The data structure which is one ended known as queue.
 - 2) In the priority queue insertion and deletion takes place at any position.
 - 3) The linear array are called one dimensional array.
 - 4) A terminal node in a binary tree is called root.
2. A) Write short note on following : 8
- 1) Complexity of algorithm.
 - 2) General tree.
- B) Answer the following : 6
- 1) Explain infix, prefix and postfix notation with examples.
 - 2) Draw the binary tree for the expression.
 $A * B - (C + D) * (P / Q)$
3. Answer the following :
- A) What is Linear array ? Explain representation with examples. 7
 - B) Define stack. Explain operation on stack. 7
4. Answer the following :
- A) What is linked list ? How it is represented in memory ? 7
 - B) Discuss tower of Hanoi problem by considering three peg having three discs to be moved all from one peg to another. 7
5. Answer the following :
- A) What is graph ? Explain the difference between depth first search and breadth algorithm. 7
 - B) What do you mean by sorting ? Discuss merge sort. 7
6. Answer the following :
- A) What is insertion sort ? Explain procedure for insertion sort. 7
 - B) Define queue. Give the different application and operation of queue. 7
7. Answer the following :
- A) State and explain the concept of threaded binary tree with suitable example and diagram. 7
 - B) Discuss the concept of greedy method. Give the application of greedy method. 7
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M.Sc. – I (Semester – II) Examination, 2016
COMPUTER SCIENCE (CBCS) (New) (Paper – V)
Java Programming

Day and Date : Wednesday, 30-3-2016

Max. Marks : 70

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

- Instructions :** 1) Question 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 alternative. **(10×1=10)**

1) Which one of these lists contains only Java programming language keywords ?

- A) class, if, void, long, Int, continues
- B) goto, instanceof, native, finally, default, throws
- C) try, virtual, throw, final, volatile, transient
- D) strictfp, constant, super, implements, do

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

- A) `int [] myList = {"1", "2", "3"};` B) `int [] myList = (5, 8, 2);`
- C) `int myList [] [] = {4, 9, 7, 0};` D) `int myList [] = {4, 3, 7};`

3) What will be the output of the program ?

```
public class Aclass
{
    void Aclass()
    {
        System.out.println("Class A");
    }
    public static void main(String [] args)
    {
        new Aclass();
    }
}
```

- A) Class A
- B) Compilation fails
- C) An exception is thrown at line 3
- D) The code executes with no output



- 4) Which statements are true ?
- 1) The default constructor initialises method variables.
 - 2) The default constructor has the same access as its class.
 - 3) The default constructor invokes the no-arg constructor of the superclass.
 - 4) The compiler creates a default constructor only when there are no other constructors for the class.
- A) 1, 2 and 4 B) 2, 3 and 4 C) 3, 4 and 5 D) 1, 2 and 3
- 5) Which three form part of correct array declarations ?
- 1) public int a []
 - 2) static int [] a
 - 3) public [] int a
 - 4) private int a [3]
 - 5) private int [3] a []
 - 6) public final int [] a
- A) 1, 3, 4 B) 2, 4, 5 C) 1, 2, 6 D) 2, 5, 6
- 6) public class Test { }
- What is the prototype of the default constructor ?
- A) Test () B) Test (void) C) public Test () D) public Test (void)
- 7) What will be the output of the program ?
- ```
public class myClass
{
 public static void main(String[]args)
 {
 try
 {
 return;
 }
 finally
 {
 System.out.println("Finally");
 }
 }
}
```
- A) Finally      B) Compilation fails  
C) The code runs with no output      D) An exception is thrown at runtime





8) What will be the output of the program ?

```
try
{
 int x = 0;
 int y = 5/x;
}
catch (Exception e)
{
 System.out.println("Exception");
}
catch (ArithmeticException ae)
{
 System.out.println("Arithmetic Exception");
}
System.out.println("finished");
```

- A) finished
- B) Exception
- C) Compilation fails
- D) Arithmetic Exception

9) What is the name of the method used to start a thread execution ?

- A) init();
- B) start();
- C) run();
- D) resume();

10) Which of these packages contains all the classes and methods required for even handling in Java ?

- A) java.applet
- B) java.awt
- C) java.event
- D) java.awt.event

B) Write whether **true** or **false**. (4×1=4)

- 1) The modulus operator (%) in Java can be used only with variables of integer type.
- 2) The following statement is valid  
double price = 7,450.98;
- 3) Variable name can begin with a letter, "\$", or "\_".
- 4) Each method in a class must have a unique name.

2. A) Write a short note on the following. (2×4=8)

- i) Static variable and method
- ii) User define exception

B) Answer the following. (2×3=6)

- i) Explain any 3 Random File access methods with example.
- ii) Explain types of inheritance in JAVA.



3. Answer the following.
- A) What is the difference between exception and error in java ? Explain how exception are handled in java. **7**
  - B) Write a applet program to insert and display employee information. **7**
4. Answer the following.
- A) Explain how to draw following shape in applet. **9**
    - 1) Line
    - 2) Rectangle
    - 3) Ellipse.
  - B) WAP to read number from user and check it is Prime or not. If given number is negative or zero then throw exception and give message “Enter number greater than zero”. **5**
5. Answer the following.
- A) State the feature of Border Layout and explain how to implement it. **7**
  - B) What is difference between statement and prepared Statement interface ? Explain with example. **7**
6. Answer the following.
- A) State the purpose of the following JDBC classes an interfaces. **7**
    - i) Driver manager
    - ii) Connection
    - iii) Statement
    - iv) Result set.
  - B) Explain any 3 MouseListener methods with example. **7**
7. Answer the following.
- A) What is difference between String and String buffer and explain 2 methods of String and 2 methods of String buffer class with example. **7**
  - B) Explain the inner class in java with example. **7**
-



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**M.Sc. – I (Semester – II) (New CBCS) Examination, 2016**  
**COMPUTER SCIENCE**  
**Computer Communication Network (Paper – VI)**

Day and Date : Friday, 1-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. A) Choose correct alternatives. **10**
- 1) Network organized into Layers or Levels to \_\_\_\_\_
    - a) reduce design complexity
    - b) form more bigger network
    - c) increase utilization of resources
    - d) none of these
  - 2) Which of the following is an example of wireless network and mobile computing both ?
    - a) Desktop computers in offices
    - b) A notebook computer used in hotel room
    - c) Networks in unwired buildings
    - d) Store inventory with a handheld computer
  - 3) Which of the following type of service is not provided by datalink layer to the network layer ?
    - a) Unacknowledged connectionless service
    - b) Acknowledged connectionless service
    - c) Acknowledged connection-oriented service
    - d) Unacknowledged connection-oriented service



- 4) When too many packets are present in part of subnet, performance degrades ? This situation is called as \_\_\_\_\_
- a) Error control
  - b) Flow control
  - c) Flooding
  - d) Congestion
- 5) If \_\_\_\_\_ is implemented then, a path from source to destination must be established before transmission of packets.
- a) Connectionless Service
  - b) Connection Oriented Service
  - c) Address Resolution Protocol
  - d) Access Control Protocol
- 6) \_\_\_\_\_ is a processor that keeps track of all mobile hosts within its home area.
- a) Foreign Agent
  - b) Home Agent
  - c) Visiting Agent
  - d) Local Agent
- 7) Connection release with the Berkeley sockets is \_\_\_\_\_
- a) Symmetric
  - b) Asymmetric
  - c) Disconnect
  - d) Release
- 8) Which of the following statements is true about TCP Protocol ?
- a) All TCP connections are full duplex and point-to-point
  - b) TCP does not support multicasting or broadcasting
  - c) TCP connection is byte stream
  - d) All of these
- 9) Which of the following is SMTP command ?
- a) HELO
  - b) RCPT
  - c) HELP
  - d) All of these
- 10) Which of the following is part of URL ?
- a) Protocol name
  - b) DNS name
  - c) File name
  - d) All of these

B) State **True/False**.

4

- 1) Routers are used for necessary translation in interconnection of networks.
- 2) The transport entity can be located in the operating system kernel.
- 3) Main function of datalink layer is routing.
- 4) Domain names are case insensitive.



2. A) Write short notes on the following : 8
- i) WAN
  - ii) Store and forward packet switching.
- B) Answer the following : 6
- i) Explain the optimality principle for routing.
  - ii) Define web document. Explain about static web documents and dynamic web documents.
3. Answer the following :
- A) Describe about wireless networks and also explain the concept of PAN, wireless LAN and Wireless WAN. 7
  - B) Explain connection oriented and connectionless services with their service primitives. 7
4. Answer the following :
- A) Explain the concept of sliding window protocol. Explain sliding window protocol with selective repeat strategy. 7
  - B) Explain unrestricted simplex protocol in detail. 7
5. Answer the following :
- A) Give the comparison of virtual circuit subnet and datagram subnet in detail. 7
  - B) Explain the concept of routing for mobile hosts. 7
6. Answer the following :
- A) Discuss the connection release mechanism at transport layer. 7
  - B) Explain the concept of remote procedure call in detail. 7
7. Answer the following :
- A) Explain the architecture and services of e-mail. 7
  - B) Explain the architecture overview of WWW in detail. 7
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**SLR-MC – 279**

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**M.Sc. – I (Semester – II) (New CBCS) Examination, 2016**  
**COMPUTER SCIENCE**  
**UML (Paper – VII)**

Day and Date : Monday, 4-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1.A) Choose correct alternatives :

**10**

- 1) What are the notations for the use case diagrams ?
  - a) Use case
  - b) Actor
  - c) Prototype
  - d) Both (a) and (b)
- 2) Which of the following determines state diagram ?
  - a) The UML notation for specifying finite automata is the state diagram
  - b) In the state diagrams state are represented by rounded rectangle
  - c) All of the above
  - d) None of the above
- 3) Which of the following are composite states ?
  - a) A sequential composite state
  - b) A concurrent composite state
  - c) All of the above
  - d) None of the above
- 4) Which among the following are not the valid notations for package and component diagram ?
  - a) Notes
  - b) Box
  - c) Extension mechanisms
  - d) Packages

**P.T.O.**



- 5) What is an interaction diagram ?
  - a) Interaction diagrams are the UML notations for dynamic modeling of collaborations
  - b) Interaction diagrams are a central focus of engineering design
  - c) All of the above
  - d) None of the above
  
- 6) A package diagram consists of the following ?
  - a) Package symbols
  - b) Grouping of usecases, classes, components
  - c) Interface
  - d) Both (a) and (b)
  
- 7) Components can be represented by which of the following ?
  - a) Component symbols
  - b) Stereotypes
  - c) Rectangular boxes
  - d) Both (a) and (b)
  
- 8) Which among these are the common notations for deployment diagrams ?
  - a) Artifacts and nodes
  - b) Stereotypes
  - c) Components
  - d) All of the above
  
- 9) What does a deployment diagram consists of ?
  - a) Computational resource
  - b) Communication path between resource
  - c) Artifacts that execute resource
  - d) All of the above
  
- 10) Which of the following states about concurrent region ?
  - a) It is concurrent composite state contain two or more concurrent state diagrams separated by dashed lines
  - b) The concurrent state diagrams specify finite automata that execute in parallel
  - c) All of the above
  - d) None of the above



- B) State **True** or **False** : 4
- 1) Artifacts instances and types have same names.
  - 2) Every indirect scenario will require changing only a single component.
  - 3) If a single architecture is being evaluated, SAAM produces a relative ranking of candidates.
  - 4) A dependency relation holds between two entities D and I where change in I does not affect D.
2. A) Write short notes of the following : 8
- I) Conceptual model of UML
  - II) Importance of object oriented modeling.
- B) Explain the following terms. 6
- I) Relationships
  - II) Class and object diagrams.
3. Answer the following :
- a) What are the objects of interaction diagram ? Explain in detail. 7
  - b) What is active class ? Write the difference between normal class and active class. 7
4. Answer the following :
- a) Explain in detail mechanisms and architecture of UML. 7
  - b) Explain the various terms and concepts used in sequence diagrams. 7
5. Answer the following :
- a) Draw collaboration diagram for creating an e-mail account and also draw the sequence diagram for sending e-mail. 7
  - b) What are the common modeling techniques for deployment diagram ? 7
6. Answer the following :
- a) Draw and explain the use case diagram for electricity bill payment system. 7
  - b) Explain the processes and threads used in modeling techniques. 7
7. Answer the following :
- a) Explain various modeling techniques for components diagrams. 7
  - b) Explain object oriented design methodology with Grady Booch's approach. 7
-





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**M.Sc. – I (Semester – II) (New CBCS) Examination, 2016**  
**COMPUTER SCIENCE**  
**DBMS (Paper – VIII)**

Day and Date : Wednesday, 6-4-2016  
Time :10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. A) Choose the correct alternative and rewrite the answer : **10**
- 1) Processed data is called \_\_\_\_\_
- A) Raw data                                      B) Information  
C) Useful data                                      D) Source
- 2) \_\_\_\_\_ keys represent relationships between tables.
- A) Primary                                              B) Unique  
C) Foreign                                              D) Master
- 3) \_\_\_\_\_ function returns the number of rows where expr. is not null.
- A) SUM                                                  B) COUNT  
C) TOTAL                                                  D) NOTNULL
- 4) The concept of joining multiple tables is called \_\_\_\_\_
- A) Equi joins                      B) Outer                      C) Inner                      D) Cross
- 5) Exclusive locks are placed on all resources when ever \_\_\_\_\_ operations are performed.
- A) Insert                                                  B) Update  
C) Delete                                                  D) All of them



- 6) The data stored in a cursor is called \_\_\_\_\_
  - A) Active data set
  - B) Pointer
  - C) Reference
  - D) Records
- 7) \_\_\_\_\_ are the two ways in which entities can participate in a relationship.
  - A) Passive and active
  - B) Total and partial
  - C) Simple and complex
  - D) Passive and simple
- 8) \_\_\_\_\_ is preferred method for enforcing data integrity.
  - A) Constraints
  - B) Stored procedure
  - C) Triggers
  - D) Cursors
- 9) A \_\_\_\_\_ array is a set of objects, each with the same data type.
  - A) Varying
  - B) Abstract
  - C) Large
  - D) Nested
- 10) In a relational schema, each tuple is divided into fields called \_\_\_\_\_.
  - A) Relations
  - B) Domains
  - C) Queries
  - D) All of the above

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

- 1) An index cannot be created on more than one column.
- 2) A data type describes data, it does not store data.
- 3) Alter privileges allows the grantee to change table definition.
- 4) The columns of an abstract datatype are referred to as its attributes.

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

- 1) Varying array
- 2) Fragmentation.

**B) Answer the following :** **6**

- 1) Explain multivalued dependency.
- 2) Discuss strong and weak entity set with example.



3. Answer the following : **14**
- 1) What is recovery ? Explain catastrophic and non-catastrophic failures.
  - 2) Differentiate stand-alone Vs distributed databases.
4. Answer the following : **14**
- 1) Explain relational algebra with example.
  - 2) Explain 2NF and 3NF with example.
5. Answer the following : **14**
- 1) What is database trigger ? Explain different types of triggers.
  - 2) Draw ER diagram for hospital management.
6. Answer the following : **14**
- 1) Write a PL SQL block to reverse a number.
  - 2) Discuss limitations of traditional file system.
7. Answer the following : **14**
- 1) Define transaction. Explain different states of transaction.
  - 2) Explain steps in query processing.
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**M.Sc. – I (Semester – II) (CGPA) (Old) Examination, 2016**  
**COMPUTER SCIENCE**  
**Paper – V : Java Programming**

Day and Date : Wednesday, 30-3-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 100

**Instructions:** 1) Question 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 alternative : 10

1) What will be the output of the program ?

```
public class SwitchTest
{
 public static void main (String[] args)
 {
 System.out.println("value =" + switchIt(4));
 }
 public static int switchIt(int x)
 {
 int j = 1;
 switch (x)
 {
 case 1: j++;
 case 2: j++;
 case 3: j++;
 case 4: j++;
 case 5: j++;
 default: j++;
 }
 return j + x;
 }
}
```

A) Value = 2      B) Value = 4      C) Value = 6      D) Value = 8



- 2) Which is a valid declarations of a String ?
- A) String s1 = null;
  - B) String s2 = 'null';
  - C) String s3 = (String) 'abc';
  - D) String s4 = (String) '\ufeed';
- 3) You want subclasses in any package to have access to members of a superclass. Which is the most restrictive access that accomplishes this objective ?
- A) Public
  - B) Private
  - C) Protected
  - D) Transient
- 4) What will be the output of the program
- ```
public class Aclass
{
    void Aclass()
    {
        System.out.println("Class A");
    }
    public static void main(String[] args)
    {
        Aclass obj1 = new Aclass();
    }
}
```
- A) Class A
 - B) Compilation fails
 - C) An exception is thrown at line 3
 - D) The code executes with no output
- 5) Which three form part of correct array declarations ?
- 1) public int a []
 - 2) static int [] a
 - 3) public [] int a
 - 4) private int a [3]
 - 5) private int [3] a []
 - 6) public final int [] a
- A) 1, 3, 4 B) 2, 4, 5 C) 1, 2, 6 D) 2, 5, 6
- 6) public class Test {}
What is the prototype of the default constructor ?
- A) Test()
 - B) Test(void)
 - C) public Test()
 - D) public Test(void)



7) Which of the following is/are legal method declarations ?

- 1) Protected abstract void m1();
 - 2) Static final void m1(){}
 - 3) Synchronized public final void m1() {}
 - 4) Private native void m1();
- A) 1 and 3 B) 2 and 4
C) 1 only D) All of them are legal declarations

8) Which is a valid declaration within an interface ?

- A) public static short stop = 23;
- B) protected short stop = 23;
- C) transient short stop = 23;
- D) final void madness(short stop);

9) What will be the output of the program ?

```
public class X
{
    public static void main(String [] args)
    {
        try
        {
            badMethod();
            System.out.print("A");
        }
        catch (Exception ex)
        {
            System.out.print("B");
        }
        finally
        {
            System.out.print("C");
        }
        System.out.print("D");
    }
    public static void badMethod() {}
}
```

- A) AC B) BC C) ACD D) ABCD

10) Which will contain the body of the thread ?

- A) run(); B) start(); C) stop(); D) main();



- B) Write whether **true** or **false** : 4
- 1) In an instance method or a constructor, “this” is a reference to the current object.
 - 2) The “switch” selection structure must end with the default case.
 - 3) An array in the Java programming language has the ability to store many different types of values.
 - 4) Assignment operator is evaluated Left to Right.
2. A) Write a short note on the following : 8
- 1) Private, protected, public.
 - 2) Interface
- B) Answer the following : 6
- 1) State various features of java.
 - 2) Describe the wrapper class in java.
3. Answer the following :
- A) Explain Applet Life cycle with example. 7
- B) What is multithreading ? Explain the life cycle of the thread. 7
4. Answer the following :
- A) Explain Types of inheritance in JAVA. 7
- B) Write a program to copy contents of one text file into another text file using command line arguments. 7
5. Answer the following :
- A) Explain ActionListener and its methods with example. 7
- B) Create an application to insert and display student information. 7
6. Answer the following :
- A) Explain how to draw following shape in applet. 9
- 1) Line
 - 2) Arcs
 - 3) Polygon
- B) What is abstract class ? State its properties with example. 5
7. Answer the following :
- A) Explain any 3 MouseListener methods with example. 7
- B) Write a program to print following pattern. 7
- ```
1 2 3 4
2 3 4
3 4
4
```
-



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**M.Sc. – I (Semester – II) (Old – CGPA) Examination, 2016**  
**COMPUTER SCIENCE (Paper – VI)**  
**Computer Communication Network**

Day and Date : Friday, 1-4-2016  
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. A) Choose correct alternatives. **10**
- 1) The early version of ARPANET used the lines with data carrying capacity of  
a) 10 kbps      b) 56 kbps      c) 64 kbps      d) 128 kbps
  - 2) Which of the following is not a primary function of datalink layer ?  
a) Dealing with transmission errors  
b) Regulating the flow of data so that slow receivers are not swamped by fast senders  
c) Providing a well-defined service interface to the network layer  
d) Congestion control
  - 3) Which of the following sliding window protocol(s) is/are bidirectional ?  
a) protocol using selective repeat    b) one bit sliding window protocol  
c) protocol using go back Nt          d) all the above
  - 4) Which of the following is not one among the basic elements of a Petri net models ?  
a) places          b) nodes          c) arcs          d) tokens
  - 5) Which of the following is correct order of nesting of transport protocol data unit ?  
a) Datalink header, Packet header, TPDU header, TPDU payload  
b) Packet header, Datalink header, TPDU header, TPDU payload  
c) Frame header, Packet header, TPDU header, TPDU payload  
d) Packet header, Frame header, TPDU header, TPDU payload

**P.T.O.**





- 6) Which of the following is not a primitive of Berkeley sockets ?  
a) BIND            b) LISTEN            c) CONNECT            d) DISCONNECT
- 7) Which of the following is/are reason(s) for failure of distance vector routing algorithm ?  
a) It faced with count to infinity problem  
b) Algorithm do not take into account line bandwidth when selecting routes  
c) It was a static routing algorithm  
d) Both (a) and (b)
- 8) Choke packets were used in the implementation of  
a) routing algorithms  
b) algorithms for quality service  
c) congestion control algorithms  
d) internetworking
- 9) From which version of HTML, the object embedding feature was made available ?  
a) version 1.0    b) Version 2.0    c) Version 3.0    d) Version 4.0
- 10) i-mode used  
a) circuit switched network            b) packet switched network  
c) both of the above            d) none of the above

B) Fill in the blanks.

4

- 1) The usual approach for the data link layer to break the bit stream up into discrete frames and compute \_\_\_\_\_ for each frame.
- 2) \_\_\_\_\_ is a technique for regulating the average rate and burstness of the data transmission in network layer.
- 3) UDP transmits segments, which consists of \_\_\_\_\_ byte header followed by the payload.
- 4) The e-mail systems normally consist of two subsystems \_\_\_\_\_ and \_\_\_\_\_



2. A) Write short notes on the following : **8**
- i) TCP segment header
  - ii) Name servers.
- B) Answer the following : **6**
- i) Discuss social issues related to computer networks.
  - ii) Explain load shedding.
3. Answer the following : **14**
- A) What are design issues of network layers ? Discuss.
  - B) How error control mechanism works in data link layer ? Explain.
4. Answer the following : **14**
- A) Describe the architecture of data link layer in the internet.
  - B) Explain shortest path routing with an example.
5. Answer the following : **14**
- A) What is jitter ? How to control it ? Explain.
  - B) How routing is done in internetwork ? Discuss.
6. Answer the following : **14**
- A) Write a note on Berkeley sockets.
  - B) What are the issues in establishing connection in TCP ? Discuss.
7. Answer the following : **14**
- A) Write a note on resource records.
  - B) How dynamic web documents differ from static web documents ? Discuss.
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**M.Sc. – I (Semester – II) (CGPA) (Old) Examination, 2016**  
**Computer Science (Paper – VII)**  
**UML**

Day and Date : Monday, 4-4-2016

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) 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
  - 2) What is true about UML stereotypes ?
    - a) A stereotype is used for extending the UML language
    - b) A stereotyped class must be abstract
    - c) The stereotype {frozen} indicates that the UML element cannot be changed
    - d) UML profiles can be stereotyped for backward compatibility
  - 3) What can UML interfaces be used for ?
    - a) to provide concrete classes with the stereotype <<interface>>
    - b) to program in Java and C++, but not in C#
    - c) to define executable logic that can be reused in several classes
    - d) to specify required services for types of objects
  - 4) Which is the valid event in a state diagram ?
    - a) if()
    - b) else()
    - c) close()
    - d) after()



- 5) If you need to show the physical relationship between software components and the hardware in the delivered system, which diagram can you use ?
- a) component diagram                      b) deployment diagram  
c) class diagram                              d) network diagram
- 6) What is true about a sequence diagram ?
- a) It describes the behaviour in many use cases  
b) It describes the behaviour in a user  
c) It describes the behaviour of a single object  
d) It describes the behaviour of several objects
- 7) Which diagram is NOT commonly used for illustrating use cases ?
- a) system sequence diagram              b) activity diagram  
c) use case diagram                        d) deployment diagram
- 8) UML stands for \_\_\_\_\_
- a) Universal Modified Language        b) Unified Markup Language  
c) Union Model Language                d) Unified Modeling Language
- 9) Scheduling project activities such as functional increments and test case development, which one of the following OOAD artifacts is the MOST useful ?
- a) Use cases                                  b) Interaction diagrams  
c) Activity diagrams                        d) Package diagrams
- 10) Tagged values can be represented in UML by
- a) [text string]    b) {text string}    c) notes                      d) constraint

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

4

- 1) Dependencies between deployment components tend to be the same as the package dependencies.
- 2) When creating a subclass, the selected super class should be chosen because it has some methods the subclass can reuse, even if others do not apply ?



- 3) Use cases provide the basis of communication between sponsors and developers in planning phase.
  - 4) Activity diagrams can be used to explore/discover parallel activities.
2. A) Write short notes on the following. **8**
- i) Importance of modeling
  - ii) Extensibility mechanisms.
- B) Answer the following. **6**
- i) Explain aggregation in class diagram.
  - ii) Class A implements the interface B. Represent this in UML. How would you implement this relationship in Java ?
3. Answer the following.
- a) With suitable diagram explain different views in UML. **7**
  - b) Draw the class diagram for the following code – **7**
- ```
import java.awt.Graphics;  
class Hello extends java.applet.Applet  
{  
    public void paint (Graphics g)  
    {  
        g.drawString("Hello", 10, 10);  
    }  
}
```
4. Answer the following.
- a) Describe relationship in the UML. **8**
 - b) By using classes one can model the vocabulary of a system. What are the steps used to model the vocabulary of a system. Draw a figure showing the vocabulary of Insurance Company which issues different policies to the customers through its agents. **6**



5. Answer the following.
- a) Describe various components in sequence diagram with example. **7**
 - b) What is association ? What is adornment ? What are the different types of adornments applied to association ? **7**
6. Answer the following.
- a) Draw a UML class-diagram for a partial specification of the system described below. Include as much relevant detail from the description as possible on the diagram, including attributes, associations (where possible, use formal notation for describing these) and operations. Details such as type and range of attributes and arguments of operations are not required.

A library loans three different kinds of items to customers : books, video tapes and compact disks. Each item has a title, and publisher. In addition, books have an author, and CDs have an artist. The library may have multiple copies of the same book, video tape or compact disk. There are two different kinds of customer : students and staff. For both kinds of customer, the library has their name, sex and address. students may borrow at most 20 items. **7**
 - b) What is activity diagram ? describe action state, activity state and transitions. **7**
7. Answer the following.
- a) What are a component and a node ? How these are represented in UML ? What are the differences between nodes and components ? What are the different kinds of components ? **7**
 - b) What is an event ? Describe four kinds of events that can be modeled using UML. **7**
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Seat No.	
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M.Sc. – I (Semester – II) Examination, 2016
Computer Science
DBMS (Paper – VIII) (Old) (CGPA)

Day and Date : Wednesday, 6-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. A) Choose the correct alternative and rewrite the answer. **10**
- 1) In _____ databases we have a strict parent-child relationship only.
A) hierarchical B) network
C) object oriented D) relational
 - 2) _____ operator tests column for the absence of data.
A) IS NULL B) ASSIGNMENT
C) LIKE D) NOT
 - 3) _____ is a statement that is executed automatically by the system.
A) Trigger B) Assertion
C) Durability D) Integrity constraint
 - 4) Anything that affects the database schema is a part of
A) DML B) DCL
C) DDL D) All
 - 5) The main task carried out in the _____ is to remove repeating attributes to separate tables.
A) 1 NF B) 2 NF
C) 3 NF D) 4 NF
 - 6) _____ is a combination of two or more attributes used as a primary key.
A) Composite Key B) + Alternate Key
C) Candidate Key D) Foreign Key



- 7) Select round (15. 19, 1) from dual is
 - A) 16
 - B) 15.19
 - C) 15.2
 - D) 15
- 8) To reduce redundant data to the minimum possible an object is created called
 - A) index
 - B) view
 - C) cluster
 - D) exception
- 9) When using varying arrays, the data types can consists of
 - A) only one column
 - B) many columns
 - C) only one repeating row
 - D) only one row
- 10) To change column value in a table the _____ command can be used.
 - A) crate
 - B) insert
 - C) alter
 - D) update

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

- 1) System variable \$date\$ can be assigned to any variable or field during run time.
- 2) A candidate key is a minimal super key.
- 3) The data dictionary is normally maintained by the database administrator.
- 4) Indexes adversely affect the speed at which records are reviewed.

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

- 1) Client/Server Architecture.
- 2) Catastrophic and non-catastrophic failures.

B) Answer the following : 6

- 1) Explain grant and revoke command with examples.
- 2) Explain SET operators.

3. Answer the following : 14

- 1) Explain ACID properties with suitable examples.
- 2) Write a user defined exception to accept account number and amount withdrawn. If the balance after withdrawing is less than 500 then do not update the account.



4. Answer the following : **14**
- 1) Discuss recovery techniques.
 - 2) Explain Data Models.
5. Answer the following : **14**
- 1) Explain DBMS. Discuss advantages of DBMS over traditional file system.
 - 2) Explain steps involved in a query processing with suitable diagram.
6. Answer the following : **14**
- 1) Explain 1 NF and 2 NF with suitable examples.
 - 2) Consider the data base employee (empno, ename, doj, salary, deptno) Dept (deptno, dname, Loc) and solve following queries.
 - 1) Write a query to display deptno, highest and lowest salary in each department.
 - 2) Display all employees whose joining date is from 1-Jan.-1990 to 1-Jan.-2016.
 - 3) Display empno, ename, deptno, dname of all employees.
 - 4) Display all employees whose name is 4 characters long.
7. Answer the following : **14**
- 1) Explain Cursors with examples.
 - 2) Explain relational algebra with examples.
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Seat No.	
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M.Sc. – II (Semester – III) (New CGPA) Examination, 2016
COMPUTER SCIENCE
Web Design Techniques (Paper – IX)

Day and Date : Tuesday, 29-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- 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) Correct HTML tag for largest heading is _____
 - a) <head>
 - b) <h6>
 - c) <heading>
 - d) <h1>
- 2) WWW is based on _____ model.
 - a) Client-server
 - b) Local-server
 - c) 3-tire
 - d) None of these
- 3) Which jQuery method is used to hide selected elements ?
 - a) hidden()
 - b) hide()
 - c) display(none)
 - d) visible(false)
- 4) The combination of the hexadecimal values #FF0000, #00FF00 and #0000FF creates _____ these RGB colours respectively.
 - a) Blue, Green, Red
 - b) Green, Blue, Red
 - c) Green, Red, Blue
 - d) Red, Green, Blue



- 9) What does AJAX stand for ?
 - a) Asynchronous JavaScript and XML
 - b) Automatic JavaScript and XML
 - c) Asynchronous JavaScript and XHTML
 - d) Adaptive JavaScript and XML
- 10) Which of the following is true about XHTML ?
 - a) It is a new hybrid technology that is different from both XML and HTML
 - b) It has totally replaced HTML as the tool for building web pages
 - c) It is a reformulation of HTML in XML
 - d) One cannot use it to create Web pages

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

- 1) VSPACE : Indicates the amount of space to the top and bottom of the image.
- 2) XML tags are not predefined. You must define your own tags.
- 3) <BODY BACKCOLOR="BLACK">
- 4) SOAP is language dependent.

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

- A) Anatomy of a jQuery Script.
- B) DOM.

B) Answer the following: **6**

- a) What is jQuery ? Why do we use jQuery ?
- b) State the properties of <style> tag.

3. Answer the following :

A) Develop a javascript program to display a message : **7**

- i) "HI! WELCOME TO MY PLACE" – When page is loaded and
- ii) "THANKS TO VISIT OUR WEB PAGE" – When page is unloaded.

B) Explain how to read write and delete cookies in jQuery. **7**



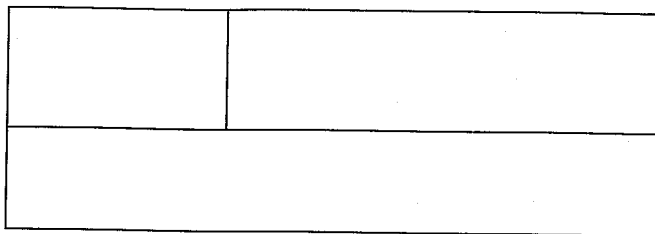
4. Answer the following :

A) What is XML ? Explain how to write an XML document ? Clearly explain the XML schema XML parsing in detail. **7**

B) What is cascading style sheet ? Explain various style sheets with examples. **7**

5. Answer the following :

A) Using Frames divide the web pages as follows : **7**



B) Explain the SOAP elements in detail. **7**

6. Answer the following :

A) Write and explain tags to create following HTML elements with their attributes : **7**

i) Textbox

ii) Drop-down list

iii) Password field

iv) Checkbox

v) Radio button.

B) What is jQuery ? Explain the use of param() method with example. **7**

7. Answer the following :

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

i) <a>

ii) <html>

iii)

iv)
.

B) What is Apache server ? Write steps to installing Apache server on windows. **7**



Seat No.	
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**M.Sc. (Part – II) (Semester – III) (New CGPA) Examination, 2016
COMPUTER SCIENCE
Paper – X : Artificial Intelligence**

Day and Date : Thursday, 31-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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 _____ attempts to solve its goal of recommending a therapy for a particular patient by first finding the cause of the patient's illness.
a) SYSTEM ENGINEER b) MOLE
c) MYCIN d) PROSPECTOR
- 2) Spot the Casual Chains as a part of Discourse and Pragmatic Processing from a text
a) There was a heavy rainfall yesterday. The colleges were closed today.
b) The shop was broken into last week. They took the TV and the stereo.
c) Sheena wanted a new bike. She decided to get a job.
d) Mahesh went on an Education trip to New York. He left on a late night flight.
- 3) Using _____ is a way to preserve the formalism and rely instead on the modularity of the world that was trying to be modeled. For that it is not necessary to use a huge joint probability table.
a) Neural Network
b) Computer Communication Network
c) Frames
d) Bayesian Network

P.T.O.



- 4) One of the efficient many-many match algorithms is _____ , in which many rules are matched against many elements in the state description simultaneously.
- a) Hashing
 - b) Clause Form
 - c) RETE Algorithm
 - d) SALT
- 5) The _____ procedure is a simple iterative process; at each step, two clauses, called the parent clauses are compared, yielding a new clause that has been inferred from them.
- a) Formal Logic
 - b) Computable functions
 - c) Proposition Logic
 - d) Resolution
- 6) To implement a graph search procedure a _____ list is maintained to store the nodes that have already been examined. A _____ list is used to check whether a newly generated node has been generated before.
- a) CLOSED
 - b) OPEN
 - c) PARTIAL CLOSED
 - d) FUTILITY
- 7) A direction in which to conduct the search can be a search forward through the _____ from the start state to a goal state.
- a) Reasoning
 - b) Problem domain
 - c) AI technique
 - d) State Space
- 8) A fuzzy set theory allows us to represent _____ as a possibility distribution.
- a) Set of Connectedness
 - b) Set of Understanding
 - c) Set of Membership
 - d) Set of Assertiveness
- 9) It is useful to distinguish between regular classes, whose elements are individual entities and _____, which are special classes whose elements are themselves classes.
- a) Base Classes
 - b) Derived Classes
 - c) Meta Classes
 - d) Inherited Classes
- 10) A _____ was guaranteed to find the shortest solution path but required inordinate amounts of space because all leaf nodes had to be kept in memory.
- a) Random Search
 - b) Breadth First Search
 - c) Depth First Search
 - d) Shortest Path Search



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

- 1) Bottom-Up 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) A MTRANS as set of primitive actions stands for focusing of a sense organ toward a stimulus.
- 3) The inferential efficiency is the ability to incorporate into the knowledge structures additional information that can be used to focus the attention of the inference mechanism in the most promising direction.
- 4) A local maximum is a flat area of the search space in which a whole set of neighboring states has the same value.

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

- i) Frames
- ii) Production system.

B) Answer the following : **6**

- i) What do you mean by Hill Climbing ?
- ii) What are the Expert task domains of Artificial Intelligence ?

3. Answer the following :

A) Define the term Knowledge Representation. Discuss in detail various issues in Knowledge Representation. **7**

B) What do you mean by Constraint Satisfaction ? Discuss the solution for the Crypt arithmetic problem as **7**

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4. Answer the following :
- A) What do you mean by Expert System Shell ? Explain in detail the process of explanation and knowledge acquisition to develop Expert Systems. **7**
 - B) Discuss Certainty Factor and Rule Based Systems as a part of Statistical Reasoning with suitable example. **7**
5. Answer the following :
- A) Define the term Predicate Logic. Discuss the basic idea of unification using an Unification algorithm as a part of Resolution. **7**
 - B) What do you mean by Game Playing ? Discuss in detail the concept of MiniMax Search Procedure for Two-Ply Search. **7**
6. Answer the following :
- A) Discuss in detail the difference between the Procedural vs Declarative Knowledge. **7**
 - B) What do you mean by Scripts ? Illustrate in detail important components of a script with suitable example. **7**
7. Answer the following :
- A) Define the term Natural Language Processing. State and explain the necessary steps to process the natural language. **7**
 - B) Define the term Artificial Intelligence. Discuss in detail the solution for Water-Jug Problem with suitable example. **7**
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Seat No.	
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**M.Sc. – II (Semester – III) Examination, 2016
COMPUTER SCIENCE
Paper – XI : Mobile Computing (New CGPA)**

Day and Date : Saturday, 2-4-2016

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) Fourier transformations are the mathematical tools to convert signal from _____ domain to _____ domain.
 - a) Time, Frequency
 - b) Frequency, Phase
 - c) Phase, Time
 - d) Code, Time
 - ii) An example for implicit 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 supplementary service provided by GSM ?
 - a) User Identification
 - b) Call Redirection
 - c) Closed User Groups
 - d) Emergency Number
 - iv) Which of the following is not function of MAC management protocol in IEEE 802.11 Wireless LAN standard ?
 - a) Synchronization
 - b) Roaming
 - c) Power Management
 - d) None of these



- v) In mobile network layer, for agent advertisement _____ protocol is used.
- a) Internet Control Message Protocol
 - b) User Gateway Protocol
 - c) Dynamic Host Configuration Protocol
 - d) Transaction Oriented TCP
- vi) Whenever traditional TCP detects the congestion, then it will take _____ as next immediate action.
- a) Fast Retransmit
 - b) Time-out Freezing
 - c) Slow Start
 - d) Splits the connection
- vii) Which of the following process in android has highest priority ?
- a) Visible Process
 - b) Started Service Process
 - c) Active Process
 - d) Empty Process
- viii) The meaning term 'bonding' in case of Bluetooth is
- a) Coupling
 - b) Sharing
 - c) Connection
 - d) Pairing
- ix) Which of the following is not a disadvantage of using small cells in cellular system ?
- a) Handover needed
 - b) Infrastructure needed
 - c) Frequency planning
 - d) Local interference only
- 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** :
- i) CSMA protocol solves the collision problem correctly.
 - ii) Roaming is not possible in IEEE 802.11 Wireless LAN in ad-hoc mode.
 - iii) Android application development uses MVC architecture.
 - iv) In co-located COA, registration procedure is difficult.



2. A) Write a short note on following : 8
- i) Signal Propagation.
 - ii) MOC.
- B) Answer the following : 6
- i) Explain about mobile IP in detail.
 - ii) What are the types of android applications ?
3. Answer the following :
- A) What is digital modulation ? Explain three different schemes of it. 7
 - B) Explain hidden and exposed terminal problem solution using MACA protocol. 7
4. Answer the following :
- A) Explain different entities and terminologies in Mobile IP. 7
 - B) Discuss about indirect TCP and snooping TCP in detail. 7
5. Answer the following :
- A) Explain the protocol architecture of IEEE 802.11 Wireless LAN. 7
 - B) What is handover ? Why to perform it ? Explain its types in detail. 7
6. Answer the following :
- A) Discuss android system architecture in detail. 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 minimum shift keying with example. 7
 - B) Discuss mobile terminated call scheme in GSM. 7
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**M.Sc. – II (Semester – III) (New CGPA) Examination, 2016
COMPUTER SCIENCE (Paper – XII)
Operations Research**

Day and Date : Tuesday, 5-4-2016

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) Linear programming is a
 - a) Constrained optimization
 - b) Technique for economic allocation of limited resources
 - c) Mathematical technique
 - d) All of the above
- 2) A feasible solution to an linear programming problem
 - a) Must satisfy all of the problem's constraints simultaneously
 - b) Need not satisfy all of the problem's constraints, only some of them
 - c) Must be a corner point of the feasible region
 - d) Must optimize the value of the objective function
- 3) For a maximization problem, the objective function coefficient for an artificial variable is
 - a) + M
 - b) – M
 - c) Zero
 - d) None of the above
- 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) An assignment problem can be solved by
- a) Hungarian method
 - b) Simplex method
 - c) Transportation method
 - d) All of the above
- 6) If the primal problem has the unbounded solution, then the dual problem will have _____ solution.
- a) Finite solution
 - b) Feasible solution
 - c) No feasible solution
 - d) Optimum solution
- 7) A dummy activity is used in the network diagram when ?
- a) Two parallel activities have the same tail and head events
 - b) The chain of activities may have a common event yet be independent by themselves
 - c) Both a) and b)
 - d) None 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 5, 10 and 8 respectively, then the expected time and variance activity are
- a) 7.80 and 6.696 respectively
 - b) 9.80 and 0.696 respectively
 - c) 9.80 and 6.696 respectively
 - d) 7.80 and 0.696 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 or False :

4

- 1) Simplex algorithm can be used to solve assignment problem.
- 2) Every standard cost minimizing transportation problem has a feasible solution.
- 3) If atleast one of the constraint is parallel to objective function in LPP then there exist infinite solutions.
- 4) CPM is a probabilistic model.



- 2. A) Write short notes on the following : 8
 - i) Convex functions.
 - ii) Critical Path Analysis.
- B) Answer the following : 6
 - i) Define basic feasible solution to a linear programming problem.
 - ii) State the formula for finding the outgoing and incoming vector in dual simplex method.

3. Answer the following :

A) Solve the following LP problem graphically and state what your solution indicates.

$$\text{Min } Z = 10x_1 + 10x_2$$

Subject to

$$x_1 + 2x_2 \leq 40$$

$$3x_1 + x_2 \geq 30$$

$$4x_1 + 3x_2 \geq 60$$

and $x_1, x_2 \geq 0.$ 8

B) What conditions must exist in a simplex table to establish the existence of an alternative solution ? No feasible solution ? Unbounded solution ? 6

4. Answer the following :

A) Give the computational procedure of finding the solution to LPP by Dual simplex method. 6

B) A methods engineer wants to assign four new methods to three work centers. The assignment of the new methods will increase production and they are given below. If only one method can be assigned to a work centre, determine the optimum assignment. 8

Methods	Increase in production (unit) work centers		
	A	B	C
1	10	7	8
2	8	9	7
3	7	12	6
4	10	10	8



5. Answer the following :

A) What is meant by graphing in Network Analysis ?

4

B) A small project consists of seven activities, the details of which are given below :

Activity	Duration (days)			Immediate Predecessor
	Most likely	Optimistic	Pessimistic	
A	3	1	7	
B	6	2	14	A
C	3	3	3	A
D	10	4	22	B, C
E	7	3	15	B
F	5	2	14	D, E
G	4	4	4	D

a) Draw the network, number the nodes, find the critical path, the expected project completion time and the next most critical path.

b) What project duration will have 95% confidence of completion ?

10

6. Answer the following :

A) Define :

i) Optimistic time ii) Pessimistic time iii) Most likely time

6

B) Solve the following non-linear programming problem :

8

$$\text{Min } Z = 2x_1 + 3x_2$$

Subject to

$$x_1 x_2 \leq 8$$

$$x_1^2 + x_2^2 \leq 20$$

and $x_1, x_2 \geq 0$

7. Answer the following :

A) Explain Ford-Fulkerson Algorithm of network flow problem.

9

B) Define Matroid with an example.

5



Seat No.	
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M.Sc. – II (Semester – III) (Old CGPA) Examination, 2016
COMPUTER SCIENCE (Paper – IX)
Java Programming

Day and Date : Tuesday, 29-3-2016

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. 2 to Q. No. 7.
3) Figures to the **right** indicate **full** marks.

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

- 1) _____ is an object which specifies change state in the source.
a) Listener b) Event c) Adapter d) None of these
- 2) Which of the following is not related with ItemEvent ?
a) List b) Choice c) CheckBox d) Button
- 3) Which of the following is not a wrapper class ?
a) Random b) Integer c) Double d) Boolean
- 4) _____ allows you to specify SQL queries in which unknown values are replaced by ?
a) Statement b) Prepared statement
c) Create statement d) Callable statement
- 5) Static instance variable is having _____
a) one copy for all object
b) separate copy for all object
c) multiple copies for every object
d) none of these



- 6) What is byte code in the context of Java ?
- a) The code generated by JVM
 - b) It is an instance of a class
 - c) The type of code generated by a Java compiler
 - d) It is another name for a Java source file
- 7) Using super keyword you can call _____
- a) subclass constructor
 - b) superclass constructor
 - c) derived class constructor
 - d) child class constructor
- 8) The _____ class creates and maintains a buffer for an input stream.
- a) Buffered Stream
 - b) Stream Buffer
 - c) Buffered Input Stream
 - d) Input Stream
- 9) Which of the following is the use of final keyword ?
- a) Prevent from method overriding
 - b) Cannot be inherited
 - c) Prevent from modified by declaring a variable
 - d) All of the above
- 10) An interface can inherit another interface by using _____ keyword.
- a) implements
 - b) extends
 - c) derives
 - d) inherits

B) State true or false :

4

- 1) Init () method is invoked only once during entire lifetime of an applet.
- 2) StringBuffer class represents fixed length and immutable character sequences.
- 3) The default value of a boolean data type is false.
- 4) The thread class defined in java.lang package.

2. A) Write short notes on the following :

8

- i) Object class
- ii) Wrapper classes.



- B) Answer the following : **6**
- i) Give the difference between suspending and stopping a thread.
 - ii) List the advantages of multithreading.
3. A) When will you use an abstract class and interface ? Explain with suitable example. **7**
- B) Define method overriding. Explain in detail with its uses. **7**
4. A) Explain different steps involved for making a connection with a database. **7**
- B) Explain the terms : **7**
- i) Check boxes
 - ii) Choice lists.
5. A) What is stream ? Differentiate Byte streams and Character streams. **7**
- B) What is an event and what are the models available for handling events ? **7**
6. A) Write a program to create two threads, one thread will print odd numbers and second thread will print even numbers between 1 to 50 numbers. **7**
- B) Write a program to illustrate the use of multi-catch statement. **7**
7. A) How do you pass parameters to an applet ? Give one example. **7**
- B) Describe the methods used to establish inter-thread communication in Java. **7**
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Seat No.	
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**M.Sc. (Part – II) (Semester – III) Examination, 2016
COMPUTER SCIENCE (Old) (CGPA) (Paper – X)
Artificial Intelligence**

Day and Date : Thursday, 31-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. A) Choose the correct alternative. **10**
- 1) A _____ is a machine that produces through time an evolving collection of symbol structure.
- a) Statistical reasoning system b) Physical symbol system
c) Generate and test d) Computable function
- 2) The _____ is a program that provides advice on mineral exploration.
- a) DENDRAL b) EMYCIN
c) DESIGN ADVISOR d) PROSPECTOR
- 3) A _____ is a step that analyzes the meaning of an individual sentence may depend on the sentences that precede it.
- a) Case Grammar b) Discourse Integration
c) Pragmatics d) Parsing
- 4) The primitive act _____ stands for transfer of mental information.
- a) ATRANS b) PTRANS c) MTRANS d) GRASP
- 5) The _____ operated by matching the left sides of the rules against the user's last sentence and using the appropriate right side to generate a response.
- a) Non-monotonic system b) ELIZA system
c) Pragmatics system d) Syntactic analysis



- 6) MYCIN uses rules to reason _____ to the clinical data available from its goal of finding significant.
a) Backward b) Forward c) EMYCIN d) Certainty
- 7) The conjunction connective of the form “m conjunction n” can be declared as _____
a) $m \rightarrow n$ b) $m \wedge n$ c) $m \vee n$ d) $m \rightarrow \rightarrow n$
- 8) Using _____, the knowledge base can support retrieval of both facts that have been explicitly be stored and of facts that can be derived from those that are explicitly stored.
a) Procedural inheritance b) Inferential inheritance
c) Property inheritance d) None of these
- 9) Local maxima are particularly frustrating because they often occur almost within sight of a solution. In this case, they are called _____.
a) Plateau b) Ridge
c) Local maximum d) Foothills
- 10) _____ is a very important process in the solution of the hard problems for which no more direct techniques are available.
a) Predicate logic b) AI problem
c) Search d) None of these

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

- 1) $P(H_i)$ is a priori probability that hypothesis i is true in presence of any specific evidence.
- 2) Expert tasks include Perception, Games, Commonsense reasoning etc.
- 3) A commutative production system is a production system and is both monotonic and partially commutative.
- 4) In chess, both opening and endgame sequence are highly stylized, so performance of a program can be enhanced by providing the list of book moves.



2. A) Write a short note. 8
- 1) Frames
 - 2) Hill Climbing.
- B) Answer the following. 6
- 1) Define the term Semantic Net.
 - 2) What do you mean by Control Strategy in Production System ?
3. Answer the following.
- A) Define Artificial Intelligence. Discuss in detail various approaches to knowledge representation. 7
- B) What do you mean by Reasoning ? Discuss in detail various Matching Scheme. 7
4. Answer the following.
- A) Define Script. Write a Classroom script with a story : 7
- “Amit went to Classroom. His turn was there to present the seminar. He demonstrates the topic. He answered the questions of audience. Then he went to Computer Laboratory.”*
- B) What do you mean by Certainty Factors ? Explain in detail Dempster Shafer theory. 7
5. Answer the following.
- A) Discuss in detail the Water Jug Problem with 5-gallon and 7-gallon jug ; neither has any markers on it. How to get exactly 1 gallon of water into 7-gallon jug ? 7
- B) State and compare the steps involved in Natural Language Processing. 7



6. Answer the following.

- A) Discuss in detail steps involved to convert well formed formulas to Conjunctive Normal Form. 7
- B) Define Heuristic Search Techniques. Discuss Constraint Satisfaction by following crypt arithmetic problem with solution 7

S E N D
+ M O R E

M O N E Y

7. Answer the following.

- A) State and explain technique of knowledge acquisition with suitable example. 7
- B) Discuss in detail various additional refinements for the modifications over MINMAX search procedure. 7



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M.Sc. (Part – II) (Semester – III) Examination, 2016
COMPUTER SCIENCE (Old CGPA)
Paper – XI : Mobile Computing

Day and Date : Saturday, 2-4-2016

Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** 1) Question No. 1 and 2 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) In mobile internet protocol at network layer, registration reply code 0 is used to indicate registration accepted and code 1 is used to indicate _____
- a) Registration rejected, but simultaneous mobile bindings supported
 - b) Registration accepted, but simultaneous mobile bindings unsupported
 - c) Registration rejected and simultaneous mobile bindings
 - d) Registration accepted and simultaneous binding supported
- ii) Active scanning comprises sending _____ on each channel and waiting for the response.
- a) Beacon
 - b) Probe
 - c) Association Request
 - d) Management Information Base (MIB)
- iii) In GSM 900, _____ channels, each wide, are used for FDMA.
- a) 200 KHz
 - b) 2000 KHz
 - c) 2 KHz
 - d) 20 KHz



iv) If mounted on the roof of a car, the length of _____ is efficient. This is also known as Marconi antenna.

- a) $\frac{\lambda}{2}$ b) $\frac{\lambda}{4}$ c) $\frac{\lambda}{6}$ d) $\frac{\lambda}{8}$

v) Which of the following is not function of MAC management protocol ?

- a) Management information Base
b) Roaming
c) Provide carrier sense signal
d) Support association and re-association of stations

vi) MAC sub layer is the part of _____

- a) Physical Layer b) Data link layer
c) Logical link control d) Access Control Mechanism

vii) In slow start mechanism, exponential growth stops at congestion _____ point.

- a) Threshold b) Resonance
c) Bearer d) Control

viii) In IEEE 802.11, BSS stands for _____ -

- a) Base Station Subsystem b) Basic Service Set
c) Base Station System d) Base Service Set

ix) The PHY layer of IEEE 802.11 offers _____ with 1 or 2 Mbit/s transfer rate to MAC layer.

- a) Service Access Point b) Management Information Base
c) Voice Activity Detection d) Tandem free operations

x) _____ is example of explicit reservation.

- a) DAMA b) PRMA
c) CSMA d) TDMA

B) State **true/false** :

- i) In GSM, all downlinks use the band between 890.2 and 915 KHz.
ii) TCP within the fixed network cannot be changed.
iii) 2.4 GHz ISM is license free band.
iv) All active devices in piconet assigned a 64-bit address.



2. A) Write short notes on the following : **(4+4)**
i) Multipath propagation.
ii) Problem of hidden terminals and exposed terminals.
- B) Answer the following : **(3+3)**
i) Explain the SDMA protocol in detail.
ii) Explain the operating subsystem components of GSM.
3. Answer the following : **(7+7)**
A) Explain the protocol architecture of GSM.
B) Explain the advanced frequency shift keying with example.
4. Answer the following : **(7+7)**
A) Explain the protocol architecture of IEEE 802.11.
B) What are the different terms and entities involved in mobile internet protocol ?
Explain with suitable diagram.
5. Answer the following : **(7+7)**
A) Explain the transaction oriented TCP with the example of TCP connection setup overhead and also give the merits and demerits of transaction oriented TCP.
B) Explain the power management in IEEE 802.11 infrastructure networks with the help of diagram.
6. Answer the following : **(7+7)**
A) Explain the client initialization mechanism in dynamic host configuration protocol.
B) Explain the protocol architecture of IEEE 802.11 wireless LAN with help of diagram.
7. Answer the following : **(7+7)**
A) Explain the following protocols : FDMA, TDMA and Fixed TDM.
B) Describe direct sequence spread spectrum technique with help of example and explain the functioning of DSSS transmitter and receiver with their block diagrams.
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M.Sc. – II (Semester – III) (Old) (CGPA) Examination, 2016
COMPUTER SCIENCE
Modeling and Simulation (Paper – XII)

Day and Date : Tuesday, 5-4-2016

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) Customers after joining the queue, wait for some time and leave the service systems due to intolerable delay, so they
 - a) renege
 - b) balk
 - c) jockey
 - d) (a) or (c)
- ii) In M/M/1: ∞ /FCFS Queue model if λ is mean customer arrival rate and μ is mean service rate then the probability of server being busy is equal to
 - a) $\frac{\lambda}{\mu - \lambda}$
 - b) $\frac{\mu}{\mu - \lambda}$
 - c) $\frac{\lambda}{\mu}$
 - d) $\frac{\mu}{\lambda}$
- iii) A manufacturer has to supply his customers 600 units of his product per year. Shortages are not allowed and the storage (carrying) cost amounts to Rs. 0.60 per unit per year. The set up cost (ordering) per run is Rs. 80. The optimal order quantity is
 - a) 160000
 - b) 450
 - c) 200
 - d) 400
- iv) PERT is used when there is a good deal of _____ regarding the time taken by various activities in the project.
 - a) certainty
 - b) uncertainty
 - c) both (a) and (b)
 - d) none of these



- v) What will be the corresponding random observation generated on continuous uniform distribution over $(-5, 5)$ when a random number generated between 0 and 1 is 0.7352 ?
- a) 12.352 b) 5.7352
c) -2.352 d) 2.352
- vi) If a r.v. X follows standard normal distribution then the variance of X is
- a) -1 b) 0
c) 1 d) None of these
- vii) Repetition of n independent Bernoulli trial reduces to
- a) Poisson distribution
b) Binomial distribution
c) Hypergeometric distribution
d) Geometric distribution
- viii) Economic Order Quantity (EOQ) results in
- a) Equalisation of carrying cost and procurement (ordering) cost
b) Minimization of set up cost
c) Favourable procurement price
d) Reduced chances of stock outs
- ix) The process of simulation
- a) is a powerful mathematical technique
b) is often referred to as “Monte-Carlo” simulation
c) usually require use of computers to solve the problems
d) involve the criterion wherein the output of simulation model is independent of the simulation run
- x) In critical path analysis, the word CPM mean
- a) Critical Path Method
b) Crash Project Management
c) Critical Project Management
d) Critical Path Management



B) Fill in the blanks : 4

- i) If the exponential distribution is given as $f(x) = 2e^{-2x}$, $0 \leq x \leq \infty$. then the mean of the distribution is _____.
- ii) The long form of PERT is _____.
- iii) Simulation of systems in which the state changes smoothly or continuously with time are called _____ systems.
- iv) In queue model completely specified in the symbolic form (a/b/c):(d/e), the last symbol e specifies _____.

2. A) i) Define Poisson distribution and state its mean and variance. 4

ii) An oil engine manufacturer purchases lubricants at the rate of Rs. 42 per piece from a vendor. The requirement of these lubricants is 1800 per year. What should be the economic order quantity per order, if the cost of placement of an order is Rs. 16 and inventory carrying charge per rupee per year is only 20 paise ? 4

B) i) Arrivals at a telephone booth are considered to be Poisson with an average time of 10 minutes between one arrival and the next. The length of phone call is assumed to be distributed exponentially, with mean 3 minutes. What is the probability that a person arriving at the booth will have to wait ? 3

ii) Define a Markov Chain. 3

3. A) Describe the deterministic inventory model of EOQ with uniform demand and no shortages. 7

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

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

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) Give the rules for constructing the network diagram in network analysis. **7**
- B) ABC Bakery keeps stock of a popular brand of cake. Previous experience indicates the daily demand as given here :

Daily Demand	0	15	30	45	60	75
Probability	0.01	0.15	0.20	0.50	0.12	0.02

Consider the following sequence of random numbers :

0.45, 0.70, 0.29, 0.58, 0.66, 0.17, 0.15, 0.34, 0.88, 0.14.

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 35 cakes every day. Also estimate the daily average demand for the cakes on the basis of simulated data. **7**

5. A) Explain briefly the important characteristics of queueing system. **7**
- B) Write an algorithm of generating m random observations from binomial distribution with parameters n and p . **7**
6. A) What are the advantages and limitations of using simulation ? **7**
- B) Give the steps of Monte-Carlo simulation technique. **7**
7. A) Differentiate between PERT and CPM. **7**
- B) Explain generation of a random sample from normal distribution. **7**
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**M.Sc. (Part – II) (Semester – IV) Examination, 2016
(New CGPA)
COMPUTER SCIENCE (Paper – XIII)
Distributed Operating System**

Day and Date : Wednesday, 30-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. A) Choose the correct alternatives : 10
- 1) The circular wait condition can be prevented by _____
 - a) Defining a linear ordering of resource type
 - b) Using thread
 - c) Using pipes
 - d) All of above
 - 2) _____ is not possible in distributed file system.
 - a) File replication
 - b) Migration
 - c) Client interface
 - d) Remote access
 - 3) In distributed file systems _____ is mapping between logical and physical object.
 - a) Heterogeneity
 - b) Naming
 - c) Migration
 - d) All of the above
 - 4) Which one of the following is a distributed file system ?
 - a) Andrew file system
 - b) Network file system
 - c) Novel network
 - d) All of the above
 - 5) RPC provides a _____ on the client side, a separate one for each remote procedure.
 - a) Stub
 - b) Identifier
 - c) Name
 - d) Process



- 6) In case of failure a new transaction coordinator can be elected by
- a) Bully algorithm
 - b) Ring algorithm
 - c) Both a) and b)
 - d) None of the above
- 7) Which routing technique is used in distributed system ?
- a) Fixed routing
 - b) Virtual routing
 - c) Dynamic routing
 - d) All of the above
- 8) Virtual memory is commonly implemented by _____
- a) Segmentation
 - b) Swapping
 - c) Demand paging
 - d) None of above
- 9) In distributed system a logical clock is associated with _____
- a) Each instruction
 - b) Each process
 - c) Each register
 - d) None of above
- 10) According to the ring algorithm links between Process are
- a) Bidirectional
 - b) Unidirectional
 - c) Both a) and b)
 - d) All of the above

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

4

- 1) Message passing provides both synchronization and communication, which are fundamental requirements for interacting processes.
- 2) Each site (node) in a distributed system is subject to the same type of failure as in a centralized system.
- 3) System calls do not change to privilege mode of the processor.
- 4) A blocking user level thread blocks the process.

2. A) Write short note on following :

8

- 1) Mutual exclusion
- 2) Message switching.

B) Answer the following :

6

- 1) Explain the concept of virtual memory.
- 2) What is the function of domain name server ?



3. Answer the following :
 - A) What are necessary conditions for deadlock to occur ? Explain the commonly used strategies to handle deadlock. **7**
 - B) What is RPC ? Explain in detail. **7**
 4. Answer the following :
 - A) Give the difference between centralized and distributed system. **7**
 - B) Explain clock synchronization in detail. **7**
 5. Answer the following :
 - A) Explain process migration. Discuss the issues which need to be addressed in designing process migration facility. **7**
 - B) Why do we use election algorithm ? Explain Berkeley algorithm. **7**
 6. Answer the following :
 - A) How the security technique can be implemented in distributed operating system ? **7**
 - B) Briefly explain atomicity and message ordering in group communication. **7**
 7. Answer the following :
 - A) What are the main difference between a MSWINDOWS NT and Novel Netware ? **7**
 - B) Explain thread design issues in distributed operating system. **7**
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M.Sc. – II (Semester – IV) Examination, 2016
COMPUTER SCIENCE (New CGPA) (Paper – XIV)
Data Mining and Warehouse

Day and Date : Friday, 1-4-2016
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

1. A) Choose correct alternatives : 10
- 1) The important aspect of the data warehouse environment is that data found within the data warehouse is _____
A) Subject-oriented B) Time-variant
C) Integrated D) All of the above
 - 2) _____ is data about data.
A) Metadata B) Microdata
C) Minidata D) Multidata
 - 3) The full form of OLAP is
A) Online Advanced Processing
B) Online Advanced Preparation
C) Online Analytical Processing
D) Online Analytical Performance
 - 4) An OLTP system focuses mainly on the _____ data.
A) Old B) Current
C) Historical D) Traditional
 - 5) A _____ is a set of views over operational databases.
A) Data mart B) Enterprise warehouse
C) Virtual warehouse D) OLAP server



- 6) A _____ allows data to be modeled and viewed in multiple dimensions.
 - A) Data cube
 - C) Database cube
 - B) Information cube
 - D) None of these

- 7) Cluster is _____
 - A) Group of similar objects that differ significantly from other objects
 - B) Operations on databases to transform or simplify data in order to prepare it for a machine learning algorithm
 - C) Symbolic representation of facts or ideas from which information can potentially be extracted
 - D) None of these

- 8) _____ is the ability of the classifier or predictor to make correct predictions given noisy data or data with missing values.
 - A) Interpretability
 - C) Robustness
 - B) Scalability
 - D) None of these

- 9) _____ where encoding mechanism are used to reduce the data set size.
 - A) Dimensionality reduction
 - C) Data cube aggregation
 - B) Attribute subset selection
 - D) Numerosity reduction

- 10) The roll-up operation is also called the
 - A) Slicing
 - C) Drill-down
 - B) Drilling
 - D) Drill-up

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

4

- 1) An OLTP system typically adopts either a star or snowflake model.
- 2) Most partitioning methods cluster objects based on the distance between objects.
- 3) Drill-down navigates from less detailed data to more detailed data.
- 4) Noise is a random error or variance in a measured variable.

2. A) Write a short note on following :

8

- i) Data integration
- ii) Data mining for intrusion detection.

B) Attempt the following questions :

6

- i) What is noise ? Explain Binning method with example.
- ii) What is data mart ? Explain in short.



3. Answer the following : **14**
A) Describe the Data Warehouse architecture with well labeled diagram.
B) What is data cube ? Explain Star Schema and Snowflake schema with diagram.
4. Answer the following : **14**
A) What is classification and predication ? Explain issues regarding classification and prediction.
B) Explain the decision tree induction algorithm.
5. Answer the following : **14**
A) What is Association Rule ? How FP-tree useful for constructing association rule ? Explain.
B) Explain data mining primitives.
6. Answer the following : **14**
A) What is cluster analysis ? Explain types of data in cluster analysis.
B) How market basket analysis is useful in day to day life ? Discuss in detail.
7. Answer the following : **14**
A) Explain the procedure of K-medoids Algorithm.
B) Explain new trends in data mining.
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M.Sc. II (Semester – IV) Examination, 2016
COMPUTER SCIENCE (New CGPA) (Paper – XV)
Digital Image Processing

Day and Date : Monday, 4-4-2016

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) Which of the following is one of the applications using electromagnetic spectrum ?
a) Electron microscopy b) Acoustic imaging
c) Radio band d) Fractal imaging
 - 2) An image of size 20×10 pixels formed with 128 gray levels need _____ bytes of storage space.
a) 25600 b) 3200 c) 320 d) 150
 - 3) Which of the following statement is not correct for Power law transform ?
a) When $c = \gamma = 1$, it becomes identity transform
b) It is application of piecewise linear transform
c) The response phenomena is known as gamma correction
d) It is one of the basic gray level transforms
 - 4) The _____ nature of the Fourier transform pair is most useful in interpreting results of image processing in the frequency domain.
a) reciprocal b) equivalence
c) discrete d) discrete and equivalence
 - 5) For a one-dimensional discrete signal with values $f(x) = [6, 6, 9, 6, 6, 9, 6, 6, 9]$, its Fourier transform $F(0)$ is _____
a) 0 b) 6 c) 7 d) 9



- 6) The response of first order derivative is _____ at the onset and end of a gray level steps and ramps.
- a) Non zero b) Zero
c) Constant d) Constant but negative
- 7) The opening of a square using circular SE will result in _____ in the area of the square.
- a) Increase
b) Decrease
c) No change
d) Either increase or no change depending size of SE
- 8) How many of the following statements are false for segmentation of region based on region splitting and merging algorithm ?
- Split into four disjoint quadrants any region R_i for which $P(R_i) = \text{FALSE}$.
 - Merge any adjacent regions R_i and R_k for which $P(R_i \cup R_k) = \text{TRUE}$.
 - Stop when no further merging or splitting is possible.
- a) None b) 1 c) 2 d) 3
- 9) A shape has 6 holes, 7 edges, 5 vertices and 4 faces. How many connected components are there ?
- a) 3 b) 5 c) 7 d) 8
- 10) The reason for knowing Hotelling transform as the principal components transform is due to the idea of using _____
- a) eigenvectors corresponding to the smallest eigenvalues
b) eigenvalues corresponding to the smallest eigenvectors
c) eigenvectors corresponding to the largest eigenvalues
d) eigenvalues corresponding to the largest eigenvectors

B) Fill in the blanks :

4

- 1) Among the electromagnetic spectrum the radiation used for angiography is _____
- 2)
$$p(z) = \begin{cases} \frac{2}{b} (z-a)e^{-(z-a)^2/b} & \text{for } z \geq a \\ 0 & \text{for } z < a \end{cases}$$
 is the PDF for _____ noise.
- 3) The technique adopted for thresholding an image with uneven illumination is _____
- 4) The 4 – chain code of an object is 0003232121. Its shape number is _____



2. A) Write short notes on the following : 8
- i) Imaging modalities in other than electromagnetic spectrum.
 - ii) Exponential noise.
- B) Answer the following : 6
- i) Find the shortest digital path between P and Q using m-adjacency.

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

- ii) A row of pixels in an image have following intensity values.
Compute their second derivatives.
0, 1, 2, 3, 2, 1, 0, 7, 7

3. Answer the following : 14
- A) What are smoothing frequency domain filters? Describe any one.
- B) What is the result of applying 3×3 min filter on the following image segment ?

42	16	31	26	19
18	7	11	13	8
14	41	32	25	49
53	6	1	4	22
62	15	33	26	5

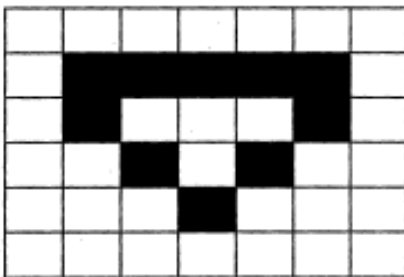


4. Answer the following : 14

- A) What are notch filters ? Describe them.
 B) Perform opening of a triangle with each side 6 cms using circle having 1 cm radius and rectangle with width 2 cm and height 1 cm.

5. Answer the following : 14

- A) Describe histogram equalization. Compare it with histogram matching.
 B) Fill the following region using region morphological filling algorithm.



6. Answer the following : 14

- A) What are region formulations ? Explain region growing algorithm.
 B) The two classes of objects denoted by ω_1 , and ω_2 have sample mean vectors $m_1 = (2, 7, 5)$, and $m_2 = (8, 4, 2)$ respectively. Compute decision boundary between these two objects.

7. Answer the following: 14

- A) Define pattern and pattern classes. Give examples.
 B) Compute the covariance matrix for the following vectors :

$$(1, 1, 0, 0)^T, (0, 1, 0, 1)^T, (1, 1, 1, 1)^T \text{ and } (1, 0, 1, 0)^T.$$



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M.Sc. – II (Semester – IV) Examination, 2016
COMPUTER SCIENCE (New CGPA)
.Net Technology (Paper – XVI)

Day and Date : Wednesday, 6-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. a) Choose the correct alternative.

10

- 1) _____ is the first event in page life cycle.
a) PreInit b) Init
c) PreLoad d) PreRender
- 2) An object reference refers to a value type is known as
a) Indexing b) Clustering
c) Boxing d) Unboxing
- 3) Intermediate Language is also known as
a) MSIL b) MSLI c) JIT d) CLR
- 4) The _____ keyword is used for including the namespaces in the program.
a) Include b) Imports c) Add d) Using
- 5) Which is not the validation server control ?
a) Required Field Validator
b) Compare Validator
c) Expression Validator
d) RegularExpression Validator
- 6) Which of the following service provided by CLR ?
a) Verification of type safety b) Interoperability
c) Providing metadata d) All of these



- 7) Collection of classes is known as
- a) Events b) Delegates
c) Namespace d) Object
- 8) A multicast delegate object maintains a
- a) list of properties b) list of classes
c) list of interfaces d) list of methods
- 9) The .Net provides multiple language support because of
- a) CTS b) CLS c) MSIL d) IL
- 10) _____ object can help to maintain data across users.
- a) Session b) Application
c) Response d) Request

b) State whether **true** or **false**.

4

- 1) Reference type variable are directly stores its data.
- 2) ExecuteReader() method generally used for aggregate functions.
- 3) The ViewState information is stored in the HTML hidden fields.
- 4) ControlToValidate attribute that must be set on a validator control for the validation to work.

2. a) Write short note on :

8

- 1) Explain SelfPosting and CrossPagePosting with example.
- 2) CTS.

b) Answer the following.

6

- 1) Explain boxing and unboxing with example.
- 2) What is dataset ? Give its advantages.

3. Answer the following.

a) Explain in detail different List Controls with example.

7

b) What is method overloading ? Give one example where method overloading is applied.

7



4. Answer the following.
 - a) What is indexer ? Explain indexer with suitable example. 7
 - b) What is multicast delegate ? Explain with suitable example. 7

 5. Answer the following.
 - a) What are the basic ADO.Net objects ? Explain in detail. 7
 - b) Explain client-side and server-side validations. 7

 6. Answer the following.
 - a) Explain Event Ordering of Master Page in detail. 7
 - b) Explain client side state management in detail. 7

 7. Answer the following.
 - a) Design a windows application which insert and search a record using stored procedure. 7
 - b) Explain different ASP.Net application folders. 7
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M.Sc. (Part – II) (Semester – IV) (Old – CGPA) Examination, 2016
COMPUTER SCIENCE
Distributed Operating Systems (Paper – XIII)

Day and Date : Wednesday, 30-3-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

1. A) Choose the correct alternatives. **10**
- 1) A _____ is an agreement between the communicating parties on how communications is to proceed.
 - a) Scheduler Activation
 - b) Protocol
 - c) Multiprocessor
 - d) Monolithic Kernel
 - 2) The sequence of instructions that is executed on every RPC is called as
 - a) Sequential path
 - b) Random access path
 - c) Scatter-gather path
 - d) Critical path
 - 3) The _____ property ensures the concurrent transaction do not interfere with each other.
 - a) Atomic
 - b) Durable
 - c) Isolated
 - d) Consistent
 - 4) The threads execute on top of _____, which is a collection of procedures that manage threads.
 - a) Compiler system
 - b) Spin lock system
 - c) Multithreaded system
 - d) Runtime system
 - 5) In _____ model, a rack full of CPUs in the machine room, which can be dynamically allocated to the users on demand.
 - a) Processor pool
 - b) Workstation pool
 - c) Multicomputer pool
 - d) Client Server pool



- 6) A _____ strategy allow better load balancing and has a major impact on system design.
- a) Non-migratory allocation b) Deterministic allocation
c) Migratory allocation d) Flexibility allocation
- 7) A file can have _____, which are pieces of information about the file but which are not part of the file itself.
- a) Directory b) Attributes c) Server interface d) Data section
- 8) The _____ allow millions of machines all over the earth to be connected at speeds varying from 64 kbps to gigabits per second for some advanced experimental networks.
- a) Local Area Networks b) World Wide Web Networks
c) Metropolitan Area Networks d) Wide Area Networks
- 9) Using _____ transparency, the resources must be free to move from one location to another without having their names change.
- a) Concurrent b) Location c) Migration d) Orphan
- 10) When a process that is ready to run but waiting from long time for the CPU allocation will lead into _____ phase of the processes.
- a) Termination b) Starvation c) Compaction d) Extermination

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

4

- 1) The advantage of blocking primitive scheme is that the sending process can continue computing in parallel with message transmitted.
- 2) When a single sender sending a message to a single receiver is called multicasting addressing.
- 3) A finite state machine model to construct server using thread can be characterized with parallelism and having non blocking system calls.
- 4) A Hybrid model provides each user with a personal workstation and a processor in addition.

2. A) Write a short note :

8

- i) Layered Protocol
ii) Clock Synchronization



- B) Answer the following : 6
- i) Briefly explain overlapping groups.
 - ii) Define the term pipes.
3. Answer the following :
- A) Discuss in detail Windows Programming Concept. 7
 - B) What do you mean by Replication ? Describe in detail various ways of File Replication. 7
4. Answer the following :
- A) Discuss in detail the Workstation Model using Diskful and Diskless Workstations. 7
 - B) What is meant by Remote Procedure Call ? Discuss in detail operation involved for sending calls and messages as Remote Procedure Call. 7
5. Answer the following :
- A) What do you mean by Distributed Operating Systems ? Elaborate its advantages and disadvantages over centralized systems. 7
 - B) Define the term Logical Clocks. Discuss in detail Lamport's Algorithm for the Clock Correction. 7
6. Answer the following :
- A) What do you mean by Client-Server Model ? Discuss in detail Reliable versus Unreliable primitives in Client Server Model. 7
 - B) What is meant by Deadlock ? Discuss distributed Deadlock Prevention and Detection algorithm ? 7
7. Answer the following :
- A) What do you mean by processor allocation ? Discuss issues for processor allocation algorithms. 7
 - B) What do you mean by Clock Synchronization ? Discuss Distributed algorithm for Mutual Exclusion. 7
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M.Sc. – II (Semester – IV) Examination, 2016
COMPUTER SCIENCE (Old CGPA)
Data Mining and Warehouse (Paper – XIV)

Day and Date : Friday, 1-4-2016

Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. A) Choose correct alternatives : 10
- 1) _____ predicts future trends and behaviors, allowing business managers to make proactive, knowledge-driven decisions.
A) Data mining B) Data warehousing
C) Data marts D) Metadata
 - 2) The star schema is composed of _____ fact table.
A) Four B) Two C) Three D) One
 - 3) An OLTP system usually adopts an _____ data model and an application-oriented database design.
A) Star B) Entity-Relationship (ER)
C) Snowflake D) None of these
 - 4) A _____ contains a subset of corporate-wide data that is value to a specific group of users.
A) Virtual B) Enterprise C) Data mart D) None of these
 - 5) _____ is data about data.
A) Microdata B) Minidata C) Multidata D) Metadata
 - 6) The process of grouping a set of physical or abstract objects into classes of similar objects is called
A) Classification B) Clustering C) Prediction D) Association



- 7) Removing duplicate records is a process called
A) Data cleaning B) Data cleansing C) Recovery D) Data pruning
- 8) The _____ operation performs aggregation on a data cube by dimension reduction or climbing up.
A) Drill-down B) Drill-up C) Dicing D) Slicing
- 9) _____ means that a DM system is smoothly integrated into the DB/DW system.
A) Loose coupling B) Semi-tight coupling
C) Tight coupling D) No-coupling
- 10) _____ specifies the data mining function to be performed, such as characterization, association, classification, prediction, clustering, outlier analysis.
A) Task relevant data B) Kind of knowledge to be mined
C) Interestingness measures D) Visualization

B) State either **True/False**.

4

- 1) Patterns contributing new information to the given pattern set are called novel patterns.
- 2) An OLTP manages large amount of historical data.
- 3) The 0-D cuboid, which holds the highest level of summarization, is called Base cuboid.
- 4) Data transformation which typically gathers data from multiple, heterogeneous and external sources.

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

8

- i) Data reduction.
ii) Data mining architecture.

B) Answer the following questions :

6

- i) What is data mart ? Explain in short.
ii) Explain four major types of concept hierarchies.

3. Answer the following :

14

- A) What is data warehouse ? Explain the difference between OLTP and OLAP.
B) What is interestingness measures ? Explain various measures of pattern interestingness.



4. Answer the following : **14**
- A) Define association rule mining and explain the steps of Apriori algorithm with example.
 - B) Explain IF-THEN Rules for classification with example.
5. Answer the following : **14**
- A) What is backpropagation ? Explain multilayer feed-forward neural network.
 - B) What is cluster analysis ? Explain types of data in cluster analysis.
6. Answer the following : **14**
- A) Explain with example agglomerative and divisive hierarchical clustering.
 - B) Explain three tier data warehouse architecture with well labeled diagram.
7. Answer the following : **14**
- A) Explain various features responsible for selecting good data mining system.
 - B) Explain various data mining applications.
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M.Sc. – II (Semester – IV) (Old CGPA) Examination, 2016
COMPUTER SCIENCE (Paper – XV)
Digital Image Processing

Day and Date : Monday, 4-4-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- 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 alternatives :

10

- 1) Which is the first fundamental step in image processing ?
 - a) Filtration
 - b) Image acquisition
 - c) Image enhancement
 - d) Image restoration
- 2) The principle energy source for images
 - a) Electrical spectrum
 - b) Magnetic spectrum
 - c) Electro spectrum
 - d) Electromagnetic spectrum
- 3) Compressed image can be recovered back by
 - a) Image enhancement
 - b) Image decompression
 - c) Image contrast
 - d) Image equalization
- 4) Smoothing filters are mostly used in
 - a) Blurring
 - b) Noise reduction
 - c) Contrast
 - d) Both a) and b)
- 5) Sobel gradient is not that good for detection of
 - a) Horizontal lines
 - b) Vertical lines
 - c) Diagonal lines
 - d) Edges



- 6) Fourier spectrum of noises are constant and usually called
a) Red noise b) Black noise c) White noise d) Green noise
- 7) Dilation followed by erosion is called
a) Opening b) Closing c) Blurring d) Translation
- 8) Image histogram will provide an information on
a) Image size b) Image statistics
c) Image intensity d) Image type
- 9) _____ is the process of moving a filter mask over the image and computing the sum of products at each location.
a) Convolution b) Correlation
c) Spatial domain d) Mask
- 10) Feature selection means
a) Compression b) Recognition
c) Description d) Representation

B) Fill in the blanks :

4

- i) _____ filters are used for blurring and for noise reduction.
- ii) _____ is an area that also deals with improving the appearance of an image.
- iii) The _____ mean filter works well for salt noise, but fails for pepper noise.
- iv) _____ processes can be denoted by the expression
 $g(x, y) = T [f(x, y)]$.

2. Answer the following :

- A) Discuss the fundamental steps in general digital image processing and compare high level and middle level image processing. 8
- B) Illustrate the techniques of point and line detection. 6



3. Answer the following : 14

- A) Give the basic step for the filtering in the frequency domain and explain the need of pre-processing and post processing.
- B) How do you perform the shape detection using Hit or Miss transformation ?

4. Answer the following : 14

- A) Consider the two image subsets S1 and S2 shown in the following figure. For $V = \{1\}$ determine whether these two subsets are (a) 4 adjacent, (b) 8-adjacent or (c) m-adjacent.

	S ₁					S ₂				
0	0	0	0	0	0	0	0	1	1	0
1	0	0	1	0	0	1	0	0	0	1
1	0	0	1	0	1	1	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1	1

- B) Explain histogram equalization transforming process.

5. Answer the following : 14

- A) Describe the region based segmentation techniques with example.
- B) What is restoration ? Explain the degradation model.

6. Answer the following : 14

- A) Define boundary descriptor. Explain any one boundary descriptor technique with example.
- B) Express the 2-D DFT and its inverse and define Fourier spectrum, phase angle, power spectrum and dc component of spectrum.

7. Answer the following : 14

- A) Explain the term patterns and pattern classes in terms of object recognition.
 - B) Give the basic mechanism of erosion and dilation in morphological image processing.
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**M.Sc. – II (Semester – IV) Examination, 2016
COMPUTER SCIENCE
(Old CGPA)
Paper – XVI : .NET**

Day and Date : Wednesday, 6-4-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

1. A) **Each** question below gives a multiple choice of answers, choose the most appropriate one. 10

- 1) _____ method returns true if you pass it “”
 - a) isEmpty()
 - b) isNull
 - c) isEmpty()
 - d) isNullWord
- 2) _____ is a special kind of loop that works on IEnumerable <T>.
 - a) While
 - b) foreach
 - c) do-while
 - d) for
- 3) A _____ method used to figure out if certain object is in collection.
 - a) substring
 - b) contains
 - c) search
 - d) lookup
- 4) System.Windows.Forms is an examples of one of these
 - a) Namespace
 - b) Package
 - c) directory
 - d) Class
- 5) Button1.text and checkbox2.name are example of _____
 - a) Attributes
 - b) Classes
 - c) Components
 - d) Properties
- 6) _____ is a variable that points to an object.
 - a) Reference
 - b) Clone
 - c) Instance
 - d) Object



- 7) _____ used to avoid duplicate code in subclasses.
- a) Encapsulation b) Abstraction
c) Inheritance d) Polymorphism
- 8) Inheritance adds the base class _____ properties and methods to subclass.
- a) Enums b) Fields
c) Objects d) Structs
- 9) _____ show() method shows the system response window.
- a) Message.show() b) Window.show()
c) MsgBox() d) Alert.show()
- 10) Everything is public interface is always _____
- a) Public b) General
c) Protected d) Private

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

- 1) It is not mandatory for a class to implement methods defined by interface.
- 2) DOT NET Framework has a bunch of classes that handle all of generics.
- 3) An attribute is a special tag that you can add to the top of any C# class.
- 4) All your data ends up uncoded as bytes.

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

- i) Common Type System.
- ii) Common Language Specification.

B) Answer the following : **6**

- i) Explain how boxing and unboxing is carried out in C# environment.
- ii) What is Delegate ? Describe the different types of delegates available in C#.



3. Answer the following :
- A) Differentiate in between ADO and ADO.NET. 7
 - B) What is web.config ? Explain its advantages and disadvantages. 7
4. Answer the following :
- A) Explain the use of Request, Response, Session and application objects. 7
 - B) Define Web form. Explain how to maintain the state of web form with suitable example. 7
5. Answer the following :
- A) Write C# program to multiply two matrices of size 3x3. 7
 - B) Explain the stepwise process of debugging ASP.NET Application. 7
6. Answer the following :
- A) What is Master Page ? Write the stepwise process of crating master page. 7
 - B) What is Validator ? Describe the different type of validator with example. 7
7. Answer the following :
- A) Explain how destructor and garbage collection works in C#. 7
 - B) What is connection pooling ? Describe *DataSets*, *DataAdapters* and *Data Table* in brief. 7
-