S.No. 7065

MCA, Second Semester, May 2017

Object Oriented Programming Using C++

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1

i. Cin and Cout are not keywords. Justify.

ii. Why inline functions are necessary?

iii. How C++ achieves runtime polymorphism.

iv. Compare overloading and overriding with example.

v. Write a program to illustrate the concept of parameterized constructor.

vi. What is pure virtual function?

vii. Exlain Exception handling.

viii. What are templates? Create a function template for Stack.

UNIT-I

Q. 2 Explain various features of object oriented programming.

Q. 3 What is dynamic memory management? Write a C++ program to demonstrate the usage of new and delete operator for a single variable as well as for an array.

P.T.O.

UNIT-II

Q. 4 Implement Friend Function and Friend Classes with an example. Highlight the privileges enjoyed by friends.

Q. 5 Describe in details the two methods of Overloading operators.

UNIT-III

Q. 6 What is inheritance? Explain different type of inheritance possible in C++.

Q. 7 Illustrate with an example program, the order in which constructors & Destructors are called for global, local automatics and local static objects created insidep main and sub functions.

UNIT-IV

Q. 8 Write a program to

(i) Create a Random-Access File

(ii) Write data randomly to a Random-Access File

(iii) Read from a Random-Access File sequentially

Q. 9 Give a detailed description of the concepts of exception handling with specific refernce to the concepts of re-throwing an exception, exception specification etc.

S.No. 7066

MCA, Second Semester, May 2017

Data Structure

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1

i. What is data type?

ii. Explain string pointer.

iii. Explain application of queue.

iv. What dynamic memory?

v. What is B+ tree?

vi. Explain Red Black Tree.

vii. What is sorting?

viii. Define hashing.

UNIT-I

Q. 2 Explain the different way of analyzing an algorithm.

Q. 3 Differentiate between Primitive and Non-Primitive Data Structure.

UNIT-II

Q. 4 In circular linked list, how the end-of-list condition will be tested?

Q. 5 Explain different operation in Stack.

P.T.O.

UNIT-III

Q. 6 Prove that a strictly binary tree with n leaves contains 2n-1 nodes.

Q. 7 Write algorithm to traverse a binary tree in Preorder and In-order.

UNIT-IV

Q. 8 What do you mean by shortest path problem? Write and explain warshall's algorithm in detailed with the help of example.

Q. 9 Explain with the help of merge sort algorithm.

S.No. 7068

MCA, Second Semester, May 2017

Organisational Behaviour

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1 Attempt all parts of question No. 1. 8x3=24

i. Explain nature of organisatinal behavious in brief.

ii. What are personality types?

iii. Define Attitude and behaviour.

iv. What do you mean by behaviour change?

v. What are the stages of group development?

vi. Define organisational conflicts.

vii. What are sources and uses of Powers?

viii. Define organisational culture.

UNIT-I

Q. 2 How organisational behaviour is related to organisational effectiveness. Give examples. 14

Q. 3 What are determinants of personality? Discuss why assessment of personality traits are needed for increasing self awareness. 14

UNIT-II

Q. 4 Explain attitude and value perceptual processes. Discuss effect of perception on Individual Decision Making. 14

Q. 5 Explain concept of motivation and theories of motivation. Discuss their application for behaviour change. 14

UNIT-III

Q. 6 What are group dynamics? Discuss group conflicts and group decision making role in team effectiveness. 14

P.T.O.

Q. 7 What is the concept of roles? Discuss role dynamics, role conflicts and stress with their implications. 14

UNIT-IV

Q. 8 Discuss different leadership styles and their effectiveness with examples. 14

Q. 9 Explain the concept of organisational development and discuss contemporary issues related to organisational culture and climate. 14

S.No. 7069

MCA, Second Semester, May 2017

Computer Networks and Data Communication

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1 Attempt all parts of question No. 1. 8x3=24

i. What are the factors that determines whether a communication system is a LAN, MAN or WAN?

ii. What are the disadvantages of Mesh topology?

iii. Comment on the necessity of switching.

iv. What are the responsibilities of Data link layer?

v. Discuss in short Twisted Pair cable.

vi. Write short note on error detection and error correction.

vii. What do you understand by flooding?

viii. Explain design issues of network layer.

UNIT-I

Q. 2 What do you mean by computer network? Discuss its advantages and disadvantages. 14

Q. 3 Explain ATM? Why it is used? What are the various security concerns related to it? How they can be reduced or eliminated? 14

UNIT-II

Q. 4 Explain in detail, Unguided Transmission media. 14

Q. 5 What is circuit switching? Discuss how packet switching is better than circuit switching for computer to computer communication. 14

UNIT-III

Q. 6 How CSMA/CD improves the performace of CSMA. 14

P.T.O.

Q. 7 Why is it important for protocols configured on the top of Ethernet to have a length field in their header, indicating how long the message is? Discuss what kind of problems arise when two computers on the same Ethernet share the same MAC (hardware) address. 14

UNIT-IV

Q. 8 Discuss Distance Vector routing. 14

Q. 9 What do you mean by congestion control? On which principle it work? Expain by example. 14

S.No. 11077

MCA, Fourth Semester, May 2017

Data Warehousing and Mining

Time: 3 Hours Marks:80

Note: Q. No. 1 is compulsory (24 marks). Attempt five questions in all by selecting at least one question from each unit (14 marks). All questions carry equal marks.

Q. 1

i. What is typical OLAP operations?

ii. Explain Data warehouse schemas.

iii. What is Data Discretizaion? Explain.

iv. Explain Baye's classification.

v. What is Decision Tree? Explain.

vi. Explain the concept of support vector mchine.

vii. Explain the concept of Evaluation of clustering.

viii. What do you mean by market based analysis?

UNIT-I

Q. 2 a) What do you mean by data warehouse? Explain the principles of Data Warehousing in detail.

b) Explain the history and characteristics of data warehouse in detail.

Q. 3 Explain the following:

a) Data Cube Computation Methods

b) Three Tier Data Warehouse Architecture

UNIT-II

Q. 4 What do you mean by Data preprocessing? Also explain the Concept of Data Integration and Transformation, Data Reduction and Data Transformation in detail.

Q. 5 a) What is Data Mining? Explain the importance of Data Mining in detail. Also explain Data mining vs Query Tools in detail.

P.T.O.

b) What is data mining models? Explain Kamber's Model of KDD in detail.

UNIT-III

Q. 6 What do you mean by Mining Associtation Rules? Explain the types of Association Rules and methods for mining association rules in Transaction Databases in detail.

Q. 7 Explain the following in detail:

a) Pattern Evaluation Methods and Pattern Mining in Multi-dimensional Space

b) Constraint Based Frequent Pattern Mining and Compressed or Approximate Patterns

UNIT-IV

Q. 8 Explain the Applications of Data Mining in Business Intelligence, Web Search Engines and Education in detail.

Q. 9 a) What do you mean by clustering Analysis? Explain the different clustering methods in detail.

b) What do you mean by Model Evaluation and selection? Explain in detail:

S.No. 11079

MCA, Fourth Semester, May 2017
Advanced Computer Architecture

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1 8x3=24

i. Explain Flynn's classification of computer architecture.

ii. What are the advantages of loop unrolling technique of code scheduling?

iii. What do you mean by branch penalities>

iv. Draw a timing diagram showing a supercalar processor with degree (m)=3.

v. What are characteristics of VLIW architecuture?

vi. Describe the barrel shifter and its implementation with an example.

vii. Is omega network a blocking or non blocking network? What is the difference between blocking and non blocking network?

viii. Explain briefly critical section and parallel for-loop selective invalidation schemes.

UNIT-I

Q. 2 a) What is Computer Architecture? Explain multilevel hierarchical frame work of Computer Architecture. 7

b) Explain Global scheduling technique used in ILP (Instruction level Parallel) Processors. 7

Q. 3 a) What is Parallelism? What are the "Data Control and resource dependencies" conditions of parallelism? Explain. 7

P.T.O.

b) Describe the implementation and logical layout about the pipelined execution of integer and boolean instructions in context to RISC and CISC processors. 7

UNIT-II

Q. 4 a) With the help of time-space diagram of pipline, explain the delayed branch handling technique. 8

b) What is concept of register renaming? Explain with an example. 6

Q. 5 a) What is multiway branching? Explain its merits and demerits. 7

b) What is Shelving? Discuss layout of shelving buffers. 7

UNIT-III

Q. 6 Explain UMA, NUMA and COMA multiprocessors models with their operational structure. 14

Q. 7 Explain the following static interconnect networks: 14

Star, Chordal Ring of Degree 3, Hyper cube, tree and 2D mesh. Also compare them.

UNIT-IV

Q. 8 a) What is Cache coherence problem. Explain snoopy cache coherence protocol. 7

b) Compare the read bandwidth of locked, pended and split Transaction buses. 7

Q. 9 a) Mention and explain the three types of cache directory protocols. 7

b) Describe the modular construction of butterfly switch network with 8x8 crossbar switches. 7

S.No. 11078

MCA, Fourth Semester, May 2017

Programming with JAVA

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1 Explain the following: 8x3=24

i. Wrapper class

ii. JVM

iii. Byte Code

iv. Built in Exception

v. Multithearding

vi. HTML Applet Tag

vii. Character stream

viii. Which classes can an Applet Extend?

UNIT-I

Q. 2 State the use of Constructor and finalize method in JAVA using a programming example. Show how garbage collection is achieved here. 14

Q. 3 Explain method overloading and method overriding with suitable examples? Can you overloads operations in JAVA? 14

UNIT-II

Q. 4 What is package in JAVA. Discuss the level of access protection in a package? 14

P.T.O.

Q. 5 Define an Exception and discuss how user defined Exception can be Implemented in JAVA? 14

UNIT-III

Q. 6 Discuss Applet life cycle in detail with proper execution of all methods? 14

Q. 7 Distinguish between: 7x2=14

i) Input Stream and Reader classes

ii) Output Stream and Writer classes

UNIT-IV

Q. 8 Explain the Event delegation model in detail. 14

Q. 9 Write applets to draw the following shapes: 14

a) Cone

b) Cylinder

c) Circle inside a Square

S.No. 7071

MCA, Fourth Semester, May 2017
Advance Computer Architecture

Time: 3 Hours Marks:80

Note: Attempt five questions in all, selecting one question from each of the four units. Q. No. 1 is compulsory.

Q. 1 8x2=16

i. Define microinstruction with their format?

ii. State different types of hazards that occur in pipeline.

iii. Define shelving and register renaming technique.

iv. Differentiate static and dynamic branch prediction.

v. Define locality of reference.

vi. Define hit ratio.

vii. What is Amdahl's law?

viii. Define network communication latency.

UNIT-I

Q. 2 a) Explain detecting and protecting loop level parallelism of VLIW. 8

b) Discuss working principle of pipeline. 8

Q. 3 a) How to make a good relationship between programming language and parallel architecture? 8

b) Discuss dependence graph to find dependency between instructions. 8

P.T.O.

UNIT-II

Q. 4 Explain the states in 2-bit prediction scheme used for dynamic branch prediction. 16

Q. 5 Explain the basic structure of a MIPS floting point unit using Tomsulo's algorithm. 16

UNIT-III

Q. 6 Define and list the node degree,number of link and network diameter for the following: 16

(a) Completely connected (b) Binary tree (c) 2D-mess (d) 2D-Torus (e) Barrel shifter (f) Chordal ring (g) Systolic array (h) Elliac mess.

Q. 7 (a) Explain UMA and NUMA architecture with diagram. 10

(b) Discuss network performance parameters. 6

UNIT-IV

Q. 8 Explain draw an 8x8 omega network using 2x2 switches from the network show the following connection between I/O 16

Input	0	4	3	6	7	5	2	1
Output	6	7	0	4	3	1	2	5

Is the network blocked or not? If it is blocked, How can you resolve the conflicts.

Q. 9 What is bus arbitration explain different mechanisms used for bus arbitration. 16

S.No. 11075

MCA, Fourth Semester, May 2017

Design and analysis of algorithms

Time: 3 Hours Marks:80

Note: Q. No. 1 is compulsory (24). Attempt five questions in all, selecting at least one question from each unit. All questions carry equal marks (14).

Q. 1 Explain the following in detial:

i. Bucket sort

ii. Releation of shortest path

iii. Red-black Trees

iv. Bellman-Ford Algorithm

v. Approximation Algorithms

vi. Huffman Codes

vii. Optimal Binary Search Trees

viii. Radix Sort

UNIT-I

Q. 2 What is Algorithm? Explain the role of algorithms in computing in detail. Also explain the concept of Analyzing Algorithms and Designing Algorithms in detail.

Q. 3 (a) What do you mean by Heap sort and Quick sort? Also explain the concept of Lower Bounds for sorting with example.

(b) Explain the Complexity of Iterative Programs and Recursive Programs in detail.

UNIT-II

Q. 4 What do you mean by Dynamic Programming (DP)? Explain the Elements of DP in detail. Also explain the

P.T.O.

Concept Longest Common subsequence and Optimal Search Trees in detail.

Q. 5 Explain the following in detail:

(a) Hash Tables and Hash Functions

(b) Analyzing various operations on Binary search Tree

UNIT-III

Q. 6 (a) What do you mean by Analysis of Dijkstra's Algorithm? Also explain the limitations of Dijkstra's Algorithm in detail.

(b) What do you mean by Maximum Flow? Explain Flow network and Ford Fulkerson method in detail.

Q. 7 (a) What do you mean by Greedy Techniques (GT)? Explain the Elements of GT. Also explain Knapsack problem in detail.

(b) Explain the Analysis of Floyd warshall algorithm in detail.

UNIT-IV

Q. 8 (a) What do you mean by NP-Hard Problems? Explain Traveling salesman Problem in detail.

(b) What do you mean by strings? Explain Rabin-Karp string matching algorithm in detail.

Q. 9 (a) What do you mean by Computational complexity? Explain notion of Polynomial Time Algorithms in detail.

(b) What do you mean by Complexity Classes? Explain P, NP, Np-Hard and NP-Complete in detail.

Sr No. 7074-II

SET-2

Examination-MCA 4th may-2017

Time: 3 Hours

Subject-Artificial Intelligence

Paper Code: MCA-14-45(II)

Note-Attempt Five Questions in all selecting one question from each unit. Question No. 1 is compulsory. All questions carry equal marks (16).

Time: 3 hrs

Max. Marks : 80

Q1: Explain the following in brief:

a) Application Areas of Artificial Intelligence
b) Associative Networks
c) Dominance
d) Hill Climbing Algorithm
e) Transition Network Parser (TNP)
f) Rule Based Expert System
g) Intelligent Editors
h) Learning by Automata

Unit-1

Q2: What do you mean by Artificial Intelligence and its Components? What is the criterion to check the Intelligence of a system?

Q3: (a) What do you mean by Resolution and Unification?
(b) Explain Frames and Scripts in Detail.

Unit-2

Q4: (a) What do you mean by State Space Search? Explain using Suitable Examples.
(b) Explain the Difference between Data Driven and Goal Driven Search.

Q5: Explain the A* and Min-Max Algorithms in detail.

Unit-3

Q6: What is Production System? Explain Decomposable and Non-Decomposable Production system in detail.

Q7:Explain the following in detail:
(a) Stanford Certainty Factor Algebra.
(b) The Bayesian Probability Theory

Unit-4

Q8: (a) What is Natural Language Processing? Explain various phases in natural Language Understanding.
(b) Explain Chomsky Hierarchy of Formal Languages.

Q9: Write Short Notes on

a) Augmented Transition Network Parser
b) Genetic Algorithms