

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-I

(Problem Solving & Programming)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What are constants and variables in C ? Explain library functions in C and mention its use in programming with examples.
2. Explain the difference between a flowchart and an algorithm with an example. Draw a flowchart to generate a series of prime numbers less than 20.
3. Explain different loop constructs in C. Differentiate between while-loop and do-while-loop with example. Discuss the use of break and continue statement.
4. Write a C program and draw a flowchart to sort the elements of an array in descending order.
5. Explain different string handling functions in C with examples. Write a program to count the vowels, consonants and spaces in a given string.
6. What is a prototype function ? Write a C program which call a function reverse() which accepts a string and displays its reverses.
7. Differentiate between UNION and STRUCTURES. Explain each concept with the help of an example.
8. What precautions must be taken care of to use macros in C ? Design a macro to find the sum of n numbers.
9. Distinguish between "call by reference" and "call by value". Write a C program using pointers to multiply two integers.
10. Write short notes on :—
 - (a) Types of arrays.
 - (b) Recursion
 - (c) Operators in C
 - (d) I/O functions in C.



Examination Programme-2012

MCA, Part-I

<i>Date</i>	<i>Papers</i>	<i>Time</i>	<i>Examination Centre</i>
09.05.2012	Paper-I	8.00 AM to 11.00 AM	Nalanda Open University, Patna
11.05.2012	Paper-II	8.00 AM to 11.00 AM	Nalanda Open University, Patna
15.05.2012	Paper-III	8.00 AM to 11.00 AM	Nalanda Open University, Patna
17.05.2012	Paper-IV	8.00 AM to 11.00 AM	Nalanda Open University, Patna
19.05.2012	Paper-V	8.00 AM to 11.00 AM	Nalanda Open University, Patna
21.05.2012	Paper-VII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
23.05.2012	Paper-VIII	8.00 AM to 11.00 AM	Nalanda Open University, Patna
25.05.2012	Paper-IX	8.00 AM to 11.00 AM	Nalanda Open University, Patna
26.05.2012	Paper-X	8.00 AM to 11.00 AM	Nalanda Open University, Patna
28.05.2012	Paper-VI (Practical)	8.00 AM to 11.00 AM	Nalanda Open University, Patna

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-I, PAPER-II
(Computer Organization and Assembly Language Programming)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is Von Neumann Architecture? Explain its bottleneck. Why memory is required in a Computer system.
2. Draw AND, OR and NOT gates using NAND gates. Explain the difference between combinational circuits and sequential circuits.
3. What is a micro-operation? List and explain different types of micro-operations.
4. Simplify and draw a circuit diagram for the following Boolean function in SOP form using K-Map, :
 $F(A, B, C, D) = \Sigma(2, 5, 6, 7, 10, 12, 13, 15)$
5. What are counters? Explain different types of counters with circuit diagram.
6. Write short notes on :—
 - (a) Programmable Logic Array
 - (b) Interrupts
 - (c) Don't Care condition
7. What is the role of control Unit in Computers. What is the difference between hardwired control and micro-program control? What are their advantages and disadvantages.
8. Write an Assembly Language program to find the largest of three numbers. Write explanation for each step.
9. Explain the following terms:
 - (a) Instruction cycle.
 - (b) DMA
 - (c) Decoder
 - (d) RAID
10. What is meant by Pipelining? Why do we require Instruction Pipelining? Explain its working procedure. Discuss the pipeline performance measures.



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-III

(Discrete Mathematics)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. (a) Define proposition, conditional and Bi-conditional with its truth table.
(b) Write down the truth table of $p \rightarrow q \wedge \approx r \leftrightarrow r \oplus q$.
2. (a) Show that $[(p \rightarrow q) \wedge \approx q] \rightarrow \approx p$ is tautology.
(b) Show that $\sqrt{5}$ is irrational.
3. Use mathematical induction to prove that $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$,
 $\forall n \in N$.
4. Design a logic circuit to operate a light bulb by two switches x_1 and x_2 .
5. If $X = \{a, b, c\}$ and $Y = \{1, 2, 3\}$ find
(a) $X \times X$ (b) $X \times Y$ (c) $X \times \phi$
6. (a) How many Permutations are there of the letters, taken all at a time, of the words "COLLEGE".
(b) If there are 7 men and 5 women. How many circular arrangements are possible in which women don't sit adjacent to each other?
7. (a) Find the number of distinct sets of 5 cards that can be dealt from a deck of 52 cards.
(b) Prove that ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$.
8. A die is rolled once. What are the probabilities of the following events ?
(a) Getting an even number. (b) Getting at least 2.
(c) Getting at most 2. (d) Getting at least 10.
9. What is the Probability that a 13 card hand has at least one card in each suit ?
10. Define the followings :—
(a) Into map
(b) Onto map
(c) Inverse map
(d) Domain and Range of function
(e) Difference between co-domain and Range of function.

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—: आवश्यक सूचना :—

MCA, Part-I के सभी परीक्षार्थियों को सूचित किया जाता है कि पटना नगर निगम चुनाव के कारण दिनांक 17.05.2012 को होने वाली Paper-IV की परीक्षा अब दिनांक 18.05.2012 को प्रातः 8 बजे से 11 बजे के बीच आयोजित की जायेगी । अन्य पत्रों की परीक्षा अपने पूर्व निर्धारित तिथि, समय एवं स्थान पर आयोजित होगी ।

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-IV

(System Analysis and Design)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Define systems. Explain the characteristics of a system. Describe different types of system.
2. List the fundamental principles of S/W Development Life Cycle in detail? Explain the attributes of a good system Analyst.
3. Construct a DFD up to 3-levels for Library Information System . Make assumptions, wherever necessary.
4. Explain different types of Information systems with example for each type. How the quality of Information can be maintained.
5. Explain Modularity and its goal of design. What are the feature of good design. What is the difference between coupling and cohesion.
6. Define Forms and Reports. List advantages of using them. Describe the process of designing Forms and Reports.
7. Explain the difference between Flat files and Database files. Detail the guidelines for database design.
8. Define CASE Tools. Describe different types of CASE Tools. Explain the use of CASE Tools by an Organization. What are the advantages. of using CASE Tools.
9. What is Testing ? Why Testing is required ? Explain different types of Testing techniques.
10. Write a short note on any three of the following :—
 - (i) E-R diagram
 - (ii) Sequence Diagram
 - (iii) Risk Management.
 - (iv) Fact finding technique.

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NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-VII

(Design and Analysis of Algorithm)

Annual Examination, 2012

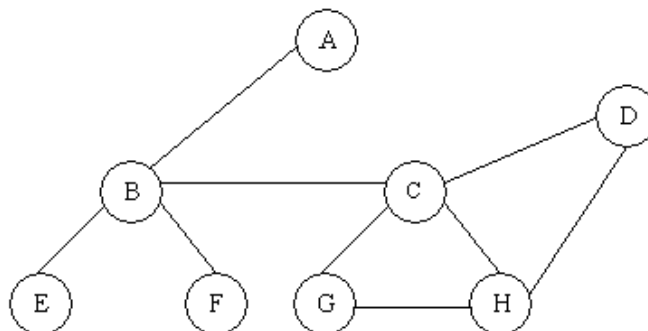
Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

- Define algorithm. What are the characteristics of an algorithm. Describe the building blocks of an algorithm.
 - Explain the divide and conquer strategy. How does binary search fit into this strategy?
- Write the principle of mathematical Induction.
 - What is a minimum cost spanning tree? Write an algorithm for anyone method for finding the minimum cost spanning tree. Also discuss its complexity.
- Sort the following list in increasing order of numbers
9, 94, 45, 47, 28, 98, 65, 42, 78, 4, 11, 88, 6
using each of the following methods,
 - Merge Sort
 - Quick Sort
 - Selection Sort
 - Heap SortFurther, count the number of operations, by each sorting method.

- For the graph given below, use DFS to visit various vertices taking C as starting vertex.



- Write an algorithm for Bubble sort for any given list. Also find the number of comparisons and assignments required by the algorithm in sorting the list.
- Differentiate important concepts of procedures and recursion.
 - Explain Sequencing, Selection and Repetition control structures with examples.
- Describe Regular Grammar and Regular Language with examples. Explain the difference between Mealy and Moore machine with examples.
- Explain greedy method based algorithm for job sequencing . Explain basic principle of dynamic programming with examples..
- Write short note on: i). Graph coloring. ii) Harniltonian cycle iii) NP-hard Problem.
- Explain different types of Finite Automata giving example for each. Describe the difference between NFA and DFA.
- Write short notes :—
 - Dijkstra's algorithm
 - Context Free Grammar
 - Growth rate of a function.

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-VIII

(Advanced Discrete Mathematics)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Define the following with example :—
 - (a) Isomorphism
 - (b) Pseudo Graph
 - (c) Complete Graph
2. Construct a 5-regular graph on 10 vertices.
3.
 - (a) Show that C_6 is bipartite and K_3 is not bipartite.
 - (b) is the subgraph of a bipartite graph bipartite ? Give reasons for your answers.
4. Show that $K_{m,n}$ is not Hamiltonian when $m + n$ is odd.
5.
 - (a) Find the edge-chromatic number of C_n .
 - (b) Give an edge colouring of the Petersen graph.
6. Show that the Grotzsch graph is non-planar.
7. Determine the number of integer solution to linear equation $x_1 + x_2 = 3$ with $0 \leq x_1 \leq 1$ and $0 \leq x_2 \leq 2$
8. Find the sum of the series,
$$\sum_{K=0}^{\infty} \frac{(K+1)^2}{K!} = \frac{1^2}{0!} + \frac{2^2}{1!} + \dots + \frac{(n+1)^2}{n!} + \dots$$
9. Solve the recurrence,
$$a_{n+1}^2 = 5a_n^2, \text{ where } a_n > 0 \text{ and } a_0 = 2. \text{ And find } a_8.$$
10. Solve the recurrence relation given by,
$$u_n = 2u_{n-1} + 2^n - 1, \text{ where } n \geq 1 \text{ and } u_0 = 0.$$

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NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-I, PAPER-IX
(Data Communication and Computer Networks)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is Networking? Why networking of devices required. Explain OSI reference model of Networking.
2. Give a comparative analysis of different types of Topologies used in Networking with their advantages and disadvantages if any.
3. What is transmission mode. Explain different types of transmission mode with examples.
4. Explain different types of switching techniques with examples. Why switching is necessary?
5. Explain connection oriented and connectionless service. Which service is more reliable and why? Explain. Which layer of OSI model support these services.
6. What is congestion control? Explain some congestion control mechanism. How does the size of congestion window increase in congestion avoidance phase.
7. Differentiate between the following:
 - (i) Pure ALOHA and Slotted ALOHA
 - (ii) UDP and TCP
 - (iv) Synchronous and Asynchronous transmission.
8. Define Error control and Flow control ? Explain Go-Back-N and Selective-Repeat ARQ methods of transmission.
9. What is Routing ? Explain different types of routing protocols with examples.
10. Write short notes on the following :—
 - (i) Transmission media
 - (ii) Piggybacking
 - (iii) Token Ring and Token Bus
 - (iv) Multiplexing

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NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-I, PAPER-X

(Principles of Management)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is an Organization structure ? Explain the key elements required for designing the organization structure.
2. Explain 5 benefits of an ERP implementation in an organization. How does a middleware can help in faster implementation of ERP in any organization bearing its own existing information system ? Explain various components of an ERP ?
3. Define MIS ?How it is important for business ? Explain. What are the different levels of management? What is the information at each level.
4. What are the different applications of computer networks in information management ? Explain some of the security threats to information systems. Also, write solutions of these threats.
5. Explain the concept of Decision Making? Explain Decision making in various conditions. What are the different attributes of information? Explain.
6. Differentiate between horizontal and vertical organizations. Also, give an example for each. Describe the tools- used in requirement analysis of software design and its management.
7. How are " Discount Cash Flow" (DCF) and "Payback Period" important for the finance department of any organization ? "ERP implementation can improve the performance and efficiency of an organization". Justify the statement with reasoning.
8. Define portfolio management. What are the methods used to carry it out ? Explain how it can be implemented ?
9. How can the neural network method be used in market analysis ? Explain with an example. What is business intelligence report ? Explain its role in information systems.
10. How can office automation system help in improving efficiency and productivity ? Explain the features of any two such systems. What is a business process ? How are they mapped with the functional areas of an organization ?



<i>MCA, Part-I, Paper-VI (Practical Examination Programme)</i>	
Time :	10:00 A.M. to 01:00 P.M.
Venue :	Computer Lab, 12th Floor, Biscomaun Tower, Patna-800001

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XII

(Object Oriented Analysis and Design)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Identify class objects instances generalization, association, inheritance of the followings and explain the properties :—
 - (i) Teacher-Student
 - (ii) Computer-and its Parts
 - (iii) Employee-Manager
2. What is the purpose of functional modelling ? Explain the model with an example.
3. Draw a DED for Library Information System upto 2 levels. Explain each component used and how they are participating in the diagram.
4. What is design optimization ? Does the rearrangement in execution order affect the design ?
5. Explain Objects, Classes, Encapsulation and abstraction with example for each.
6. Write shorts on the following :—
 - (i) Association
 - (ii) Aggregation
 - (iii) Concurrency
7. Draw a object and class diagram for University Registration System. Explain each component used in detail.
8. Write shorts on the following :—
 - (i) Sequence Diagram
 - (ii) State Diagram
 - (iii) Collaboration Diagram
9. What is Inheritance ? How does inheritance help in sharing the properties of a class ? Explain with the help of a suitable diagram.
10. Define state charts. Explain the two strategies to implement state charts.



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XIII

(Software Engineering)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Indicate various problems related with software development. Give a comparative analysis of various types of software process models.
2. Why is it justified to use engineering approach in requirement analysis? What is the significance specifying functional requirements in SRS document?
3. "Quality is built into the software during the design phase", explain. What are the types of errors you may anticipate while designing a user interface? Explain.
4. What is Cyclomatic complexity in software development? Mention the steps in the process of debugging.
5. What is the first step in software project estimation? What are the major inputs for software project estimation?
6. Define the term risk management. What are the various phases of risk management? Explain risk resolution.
7. What are the drawbacks of work breakdown structure? Explain Software project Planning.
8. Explain all the attributes of Quality of a software. What is Formal Technical Review and why it is required.
9. What is the aim of software change management process? Explain Version Control with an example.
10. Write short notes on any *Three* of the following :—
 - (i) Maintaining Web applications.
 - (ii) Software metrics
 - (iii) CASE Tools
 - (iv) Domain Engineering.

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NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XIV

(Accounting and Financial Management)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is financial accounting ? Distinguish financial accounting from management accounting.
2. What ratios are required to be calculated to test the liquidity and profitability of a business ? State those ratios.
3. The Balance Sheet of M/s Gucci and Sammi limited as at 31st December 2009 and 2010 are given below :—

Balance sheet as at 31st December

<i>Capital & Liabilities</i>	<i>2009</i>	<i>2010</i>	<i>Assets</i>	<i>2009</i>	<i>2010</i>
Share Capital	2,00,000	2,40,000	Cash	50,000	60,000
Creditors	30,000	40,000	Plant & Machinery	2,00,000	2,50,000
Debentures	1,50,000	90,000	Less Accumulated	60,000	80,000
Retained Earnings	1,25,000	1,60,000	Depreciation		
			Land	1,00,000	80,000
			Inventory	1,40,000	1,20,000
			Debtors	75,000	1,00,000
	5,05,000	5,30,000		5,05,000	5,30,000

Additional information : Cash dividends of Rs. 25,000 has been paid during the year. You are required to prepare cash flow statement.

4. Discuss the objectives and goals of financial management.
5. What are the sources of working capital finance ? Throw light on the importance of working capital for a manufacturing firm.
6. What are the reasons for holding inventory ? Explain the objectives of inventory management.
7. Write notes on any *Two* of the following :—
 - (a) Gross working capital and Net working capital.
 - (b) Negotiable Instruments
 - (c) Letters of Credit
8. What is Trial Balance ? What are the objectives of preparing Trial Balance ? Point out its limitations.
9. What are the objectives of preparing Final Account ? Explain the components of Final Account.
10. Prepare a statement of changes in working capital with the help of imaginary figures. How would you place the increase or decrease in working capital in the Fund Flow Statement ?

NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XVI

(Data and File Structure)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Define an algorithm. Explain how efficiency of an algorithm depends on the resources used by the algorithm. What is the trade-off between space and time complexity ?
2. Explain Singly linked lists, Doubly linked lists and Circularly linked lists with an example each. What is the application of a Linked list.
3. What is a Stack ? How Stacks are implemented ? Explain some applications of Stacks.
4. Write a program in C to implement recursive Inorder, Preorder and Postorder traversal of a binary tree.
5. Define a multiway tree of order m. Create a B-Tree of order 5 for the following :—
CNGAHEKMSQLWTZDPRXYS
6. Compare Kruskal's and Prim's algorithm ? Explain with the help of an example. Which graph traversal is recursive by nature.
7. Explain Internal sorting and External sorting. Explain Quicksort with an example.
8. Explain different types of File structures with their advantages and disadvantages.
9. Write a function to check the overflow condition of a list represented by an array.
10. Write short notes on any three:
 - (i) Depth First Search
 - (ii) Splay Trees
 - (iii) Heap sort
 - (iv) Circular queue.

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NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-II, PAPER-XVII
(Operating System Concepts and Networking Management)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is the purpose of a directory service in windows 2000 ? How does a domain differ from a workgroup.
2. When do DHCP clients try to renew their leases? Explain File Replication Service and Distributed File System.
3. How many built-in groups are there in Windows-2000 . Explain Virtual Networks and Remote Networking.
4. Explain different types of communication in LINUX? Give some commands to carry out these communication in LINUX.
5. Draw a diagram of SNMP architecture and show how it is used to manage network devices. What is the purpose of distributed file system ? List the four computer system vulnerabilities.
6. Discuss the various criteria for selecting a UPS for your system. Discuss and list the output of following LINUX commands :—
 - (i) who
 - (ii) chmod
 - (iii) ls-a
 - (iv) pwd
7. With help of a diagram, explain the Windows 2000 layered structure. What do you understand by a fault tolerant system ? Explain..
8. List any three recent computer security failures. Discuss various security systems and facilities.
9. List advantages and limitations of firewall. Describe backup strategies for your system. Explain different types of malicious code.
10. Write short notes on any three:
 - (i) Domain Controller
 - (ii) Active Directory
 - (iii) User Authentication Management
 - (iv) Cryptography



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XVIII

(Database Management Systems)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Draw ER diagram for the situation given below. In a Department many employees are working on many projects which are under the control of the manager of the department. The manager of the department also holds the responsibility of the welfare of the employees. Make suitable choice of the attributes for the concerned entities and transform your ER diagram into a relational database.
2. Differentiate between the following :—
 - (i) Physical data independence and Logical data independence.
 - (ii) Serial schedule and Serializable schedule.
 - (iii) Object based data models and Record based logical data models.
 - (iv) File base system and DBMS.
3. Consider the following relational database schema :—

Employee (empcode. ename, eaddress, esalary)
Department (deptcode, dname, diocation)
Project (projcode . projname, projduration)
Worksfor (empcode, deptcode, projcode, duration)

Perform following queries using SQL and relational algebra :—

 - (i) Find the name of the employees whose salary is more than 5 lacs per annum.
 - (ii) Find details of departments located in Delhi.
 - (iii) Find details of employees working on project 'P123'
 - (iv) Find the name of department in which project 'P123' is executed.
4. What are integrity constraints? Discuss different types of integrity constraints which can be imposed on databases.
5. Why is normalization of database done ? Discuss synthesis and decomposition approach of normalization with an example.
6. What is the importance of File organisation in databases ? What are the different types of file organisations available ? Discuss any one of them in detail.
7. What is a log? What are its contents? How can log be used for database recovery? Explain this with the help of an example. How is a checkpoint useful for log based recovery ? Explain with the help of an example.
8. With the help of an example prove the statement "Every relation which is in 3NF is not in BCNF but the converse is true".
9. What is the need of distributed database systems? Discuss the structure of distributed database.
10. Explain the following with the help of an example each :
 - (i) The three level architecture and its need
 - (ii) 2 Tier-client server architecture
 - (iii) Authorization in databases
 - (iv) Creation of view
 - (v) JOIN operation

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-II, PAPER-XIX
(Object Oriented Technologies and Java Programming)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. What is an object oriented paradigm ? Explain two differences between the object oriented paradigm of programming languages and the structured paradigm of programming languages.
2. What is message passing ? Explain the need of message passing in object oriented programming with an example. What is a TCP/IP socket ? Explain the use of a TCP/IP socket through an example of a program written in Java.
3. What is a constructor ? Write a Java program to explain the need of a constructor in problem solving. What is a package ? Explain the different access controls for packages in Java.
4. Write a program in Java which reads two real numbers, finds the sum of these two numbers and prints the real and imaginary part of this sum separately.
5. What is multithreading ? Explain two advantages of multithreaded programs. Write a program in Java to explain how different priorities can be assigned to different threads.
6. What is method overloading ? What are the important points which should be taken care of while overloading methods ? Write a Java program to explain the working of overloaded methods.
7. Explain two situations when String Buffer would be used for string handling. Also write a program which appends the string "programming", to the string "Java". Print the final content of the appended string.
8. What is an event ? Explain different components of an event. What is Border Layout ? Write a Java program which creates Border Layout and adds two text boxes to it.
9. What is a Servlet ? Explain the use of GET and POST methods. What is Unicode? Explain the advantage of using Unicode.
10. What is a session ? How does URL rewriting store session details ? Explain this with an example. What is an exception ? Explain, with an example, how exceptions are handled in Java.



NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-II, PAPER-XV (MCSL-36)
(LAB)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Two Sections.

SECTION - A

(Object Oriented Analysis and Design)

The University wants to computerize its admission process. The system should maintain data of all new students as well old students, their results issue admission letter, allocate study centre /program centres or should also allow students to move from one study centre to another study centre.

Perform the following tasks :—

1. Draw the use case, define all the classes and draw an object diagram.
2. Draw the sequences and collaborative diagram.

SECTION - B

(Software Engineering)

3. Perform the following tasks :—

- (a) Develop SRS.
- (b) Draw DFDs of level 0 and level 1
- (c) Draw a E - R diagram its related tables and also show its integrity constraints.

SECTION - C

(Accountancy and Financial Management)

4. Post the following transactions of a furniture shop to prepare the journal, ledger and trial balance.

September 2010	Transactions	Amount (Rs.)
2	Started the business with cash	75,000
4	Deposited in the bank	50,000
6	furniture self purchased	1,00,000
12	Purchased furniture	1,50,000
16	Sold furniture on credits	90,000
20	Sold furniture for cash	80,000
24	paid rent	11,000
26	paid salary	30,000
30	paid to suppliers	90,000



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-II, PAPER-XV (MCSL-36)

(LAB)

Annual Examination, 2012

SET-II

Time : 3 Hours.

Full Marks : 80

Answer any Two Sections.

SECTION - A

(Object Oriented Analysis and Design)

ABC consultancy wants to computerize its sale, purchase and booking of shares, through online mode. A user enters his/her user name and password (assigned at the time of registration and repressed every 15 days). User chooses one of the above actions and finally receives the transaction/account details on the action chosen.

Perform the following actions :—

1. Draw the use cases define all the classes and draw an object diagram
2. Draw the sequences and collaboration diagram

SECTION - B

(Software Engineering)

3. Perform the following tasks for the problem defined in section - A :—
 - (a) Develop SRS.
 - (b) Draw DFDs of level 0 and level 1
 - (c) Draw an E -R diagram, its related tables and also show integrity constraints.

SECTION - C

(Accountancy and Financial Management)

4. Post the following transactions of a book shop to prepare the journal, ledger and trial balance.

October 2010	Transactions	Amount (Rs.)
4	Started the business with cash	3,00,000
8	Deposited in the bank	1,00,000
12	Book self purchased	1,00,000
16	Purchased books	1,50,000
20	Sold books on credits	1,00,000
24	Sold books for cash	1,00,000
27	paid rent	40,000
29	paid salary	30,000
30	paid to suppliers	90,000

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NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-III, PAPER-XXI

(Operating System)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Explain Havender's Algorithm for deadlock prevention. Give a suitable example to explain the algorithm.
2. Write a short note on mutual exclusion in a distributed system. Explain token based mutual exclusion in the context of it.
3. Explain paging address translation by
 - (i) Direct Mapping.
 - (ii) Associative Mapping.Give suitable diagrams and examples also.
4. Give short notes on
 - (i) Disk Organisation in UNIX.
 - (ii) DOS and NOS.
 - (iii) Multiprocessor Interconnection.
 - (iv) Macintosh OS.
5. Explain the concept of Virtual memory. List any two methods for implementation and explain any one of them with the help of a diagram.
6. List and explain any five system calls for the process management.
7. Explain any five design goals of the distributed system.
8. What is the difference between security policy and security model ? Explain the access matrix model.
9. Discuss the directory structure of UNIX Operating System. How does UNIX manage the processes ? Explain.
10. Explain the concept of Thrashing. What are the two available techniques to prevent thrashing ? Explain any one of them.



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-III, PAPER-XXII

(Advanced Database Design)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. The organization called ABC undertakes several kinds of projects. Each employee can move on one or more projects. Each project is undertaken on the request of a client. A client can request for several projects. Each project has only one client. A project can use a number of items from different manufacturers and an item maybe used by several projects. Before delivery of items to a client, it is tested by testing group in the organization.
Draw an E-R diagram and convert it into a relational schema. Also identify primary key in each relation.
2. Distinguish between the followings with examples.
 - (i) Time stamping and Two-Phase locking.
 - (ii) Data mining queries and database queries.
3. What is ODBC ? What are requirements of ODBC ? Describe the components required for implementation of ODBC.
4. What do you understand by query optimization? What are query trees? Explain with an example.
5. Explain the following terms in the context of DBMS :—
 - (i) Multilevel Security
 - (ii) Auditing and Control
 - (iii) Redo log files
 - (iv) Characteristics of DBMS
6. Describe normalization using join dependency with the help of an example.
7. What are assertions ? What is the syntax for declaration of an assertion ? Also, give an example of assertion.
8. Explain the Apriori algorithm for finding frequent itemsets using an example.
9. Explain any two examples of vendor-specific security.
10. How does Oracle manage database security ? Discuss the shadow paging recovery scheme.



NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXIV
(Advanced Internet Technologies)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. How does Session Bean differ from the Entity Bean in terms of object sharing, object state and failure recovery ? Differentiate between validating and non-validating parser.
2. Explain different types of system vulnerabilities. Explain the different development goals of XML document.
3. What is a well formed tag ? Name two HTML tags that are not well formed. Write step-by-step processes to connect a database using JDBC driver and explain.
4. Explain different circumstances under which message driven bean can be used. Explain six different types of services offered by EJB container.
5. Explain the life cycle of Servlet. Write a code for demo Servlet to explain all the three stages of Servlet life cycle.
6. Explain all five basic types of implicit objects of JSP with syntax. Explain different types of restrictions on EJB.
7. What are the advantages of XML over HTML ? Explain the need/use of entities of XML document. Describe all three types of entities with the help of an example.
8. Explain the differences between session and cookie. Explain three different types of JDBC SQL statements.
9. Briefly explain the advantages,/disadvantages of different types of drivers of JDBC. Explain four basic mechanisms through which a web client can authenticate a user to a web server during HTTP Authentication.
10. Draw a diagram to show security objects dependencies and explain each security object with the help of examples. What are the two ways used for Servlet Collaboration ?



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-III, PAPER-XXV

(Computer Graphics and Multimedia)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. How do we simulate deceleration in animation scenes ? Why the animation seems to be decelerating if the spacing between frames keeps on decreasing ? Graphically discuss the mathematical function used to produce deceleration in any animation ?
2. Compare and contrast the following :—
 - (i) Cyrus Beck and Cohen Sutherland Line clipping algorithms.
 - (ii) Random and Raster Scan display devices.
3. With the help of suitable diagram and related tables describe how frame buffer can be used to control the color and intensity of the picture display ?
4. Say ABC is a triangle with coordinates A(-2,0), B(-1,1), C(-1,-1). Find the transformed coordinates when the triangle ABC is subjected to the anticlockwise rotation of 45° about an axis passing through the centroid of the triangle such that it is parallel to y axis ?
5. A polygon has 4 vertices located at A (10, 10) B (10, 40), C (40,10), D (40,40). Indicate a transformation matrix to have its reflection about X-axis ?
6. Briefly describe following file formats :—
 - (i) MPEG
 - (ii) MP3
 - (iii) GIF
 - (iv) JPG
 - (v) WAV
7. Compare and contrast the perspective projection with the parallel projection ? Justify your answer that parallel projections preserves lateral measurements ?
8. How many key frames are required to produce an animation film Sequence with duplications, having duration of five minutes ? What do you mean by terms Cell animation and Sprite animation ? Suggest which technique of animation is better and why ?
9. Differentiate between following :—
 - (i) Morphing and Panning.
 - (ii) Motion Specific animation and Motion Generalized animation.
10. What do you mean by Specular reflection ? Is there any relation of surface texture with the type of reflection produced on the exposure of that surface to some light source ? Explain with the help of diagram and suitable mathematical equations ?



NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXVII
(Artificial Intelligence and Knowledge Management)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. (a) Compare backward reasoning and forward reasoning in AI.
(b) Translate the following sentences given in English to equivalent Predicate/Propositional Calculus expression:
 - (i) Ram, who is my neighbour, is an engineer by profession.
 - (ii) Everyone except John likes Philips
 - (iii) Every human being is mortal
2. Explain briefly the limitations of an Expert System. Name two frame based expert system shells. Write down frame-based representation of CHAIR.
3. Name two built-in predicates in LISP. What are the application areas of AI? Explain.
4. Name two major reasoning strategies in AI. Explain briefly the concept of 'heuristics' and its use in AI. How does the use of heuristics reduce the search space ? Give suitable examples to explain your answer.
5. Explain briefly the main differences between an expert system and a conventional system. Discuss briefly the different types of knowledge with examples.
6. Explain briefly the knowledge representation techniques used in A.I with examples.
7. Explain each of the following in A.I. :—
 - (i) Learning
 - (ii) Understanding
 - (iii) The Turing Test
 - (iv) Uncertainty
 - (v) Combinatorial explosion
8. Write a LISP function that finds the factorial of a given natural number. Write a LISP function that counts the number of atoms in a list.
9. Describe what 'Physical Symbol System Hypothesis' is? Further, critically examine its validity, relevance and significance.
10. Discuss state space representation for the following well-known problems :—
 - (i) Travelling Salesman Problem
 - (ii) Water-Jug Problem
 - (iii) Human Cannibal River-Crossing Problem.



NALANDA OPEN UNIVERSITY

Master of Computer Application

PART-III, PAPER-XXVIII

(Numerical and Statistical Computing)

Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks. Calculate is Allowed.

- Round the number $x = 2.2554$ to three significant figures. Find the absolute error and the relative error.
 - If $\pi = 3.14$ instead of $\frac{22}{7}$, find the relative and percentage error.
 - Give the floating-points representation of the following numbers in 2 decimal digit and 4 decimal digit floating point number using (a) rounding and (b) chopping (i) 37.21829, (ii) 0.022718 and (iii) 3000527.11059.
- Find the smallest positive root of $4x^2 + 8x - 21 = 0$ with the help of Regula Falsi method.
 - Find the smallest positive root of $12x^3 - 76x^2 + 131x - 42 = 0$ with the help of Newton-Raphson method.

$$10x_1 - 7x_2 = 7$$

- Use Gauss Elimination method to solve, $-3x_1 + 2.099x_2 + 6x_3 = 3.901$

$$5x_1 - x_2 + 5x_3 = 6$$

$$4x + y + 2z = 3.6$$

- Solve the following system using the Jacobis method, $x + 3y + z = 2.5$

$$2x + y + 2z = 4.0$$

- Estimate the missing term in the following data valid it represents a polynomial of degree.

x	1	2	3	4	5
f(x)	3	7	—	21	31

- Estimate the sale of a particular quantity for 1966 using the following table.

Year	1931	1941	1951	1961	1971	1981
Sale (in thousand)	12	15	20	27	39	52

- Find the interpolating polynomial that fits the data.

x	0	1	2	5	9
f(x)	2	3	12	147	216

using the Lagrange's Interpolation formula.

- Define the following :—

(i) Random variable. (ii) Chi-square test. (iii) Continuous Random Variable.

- Calculate the value of the Integral $\int_4^{5.2} \log x dx$ by

(a) Simpson's $\frac{1}{3}$ rd rule. (b) Simpson's $\frac{3}{8}$ th rule (c) Weddle's rule

- Evaluate the Integral $I = \int_0^{\frac{\pi}{2}} \sin x dx$ using the Gauss-Legendre formulae compare with the exact solution and the values obtained by Simpson's rule.

- Solve the initial value problem

$$y' = (\tan y) + 1, y(1) = 1, t \in [1, 1.1]$$

with step size $h = 0.025$ using the second Runge-Kutta method.

- What is the utility of residual plots ? What is the disadvantage of residual plots ?



NALANDA OPEN UNIVERSITY
Master of Computer Application
PART–III, PAPER–XXIX
(Application Development with .Net Framework)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80

Answer any Five Questions. All questions carry equal marks.

1. Explain CTS (Common System Type) of .NET Framework in detail.
2. Explain Common Language Runtime features. Why are they used ?
3. Describe the guidelines for project deployment. Explain how Windows-Client applications are deployed.
4. Explain the different stages in web form processing. What is Page life cycle ?
5. Explain following terms:
 - (a) ADO Objects.
 - (b) ADO Data Control.
 - (c) SQL
6. Explain ASP.NET configuration concept in detail.
7. What is Session State in ASP.NET ? Explain.
8. Explain different types of Looping Statements in VB.NET with examples.
9. Describe different types of errors that may be found in an application. Explain the error detection and Error handling concepts.
10. Explain Universal Data Access. What is ODBC ?

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***The Examination of MCA, Part–III, Paper-XXX (Project) will be held on
01.07.2012 at 12:00 noon.
Venue: 12th floor, Biscomaun Tower, Patna-800001***

NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXIII
(Unix and Oracle)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80+20

Answer all the Questions. All questions carry equal marks.

SECTION-A

1. **Write the UNIX commands for the following :-**
 - (a) To append the contents of file2 after the contents of the file1 and redirect them to a new file3.
 - (b) To print the first difference between any two given files.
 - (c) To grant the permissions of read, write and execute to the user and read only to the group and others for all the files in a current directory.
 - (d) To direct a standard output to any of the line printer.
 - (e) To list all the files in the current directory whose file names starts with a.
 - (f) To execute some command even after logout.
 - (j) To display the last 20 lines in a given file.
2.
 - (a) Write a shell program to count no. of characters, no. of blank spaces, no. of words and no. of lines in a given file by the user.
 - (b) Write a shell script to find the day when a date is given.

SECTION-B

3. **Consider the following employee database schema :-**
EMPLOYEE (ESSN, ENAME, DEPT_NO, SALARY)
DEPENDENT (ESSN, DEPEND_NAME, RELATION, DOB)
DEPARTMENT (DEPT_NO, DEPT_NAME, MANAGER)
 - (a) Draw an E-R diagram for the given relation.
 - (b) Write the following queries using SQL command :-
 - (i) Find details of dependents for employee having name AJAY.
 - (ii) Find the name of the manager of the department in which employee with ESSN Code 5078 works.
 - (iii) Find the name of all employees whose age is less than 18 years.
 - (iv) Find the DOB of the son of the employee having employee code ESSN 5078.
 - (v) Find the details of the departments in which the employee having employee code ESSN 5078 has worked.

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NALANDA OPEN UNIVERSITY
Master of Computer Application
PART-III, PAPER-XXVI
(Advanced Internet Technologies and Computer Graphics)
Annual Examination, 2012

Time : 3 Hours.

Full Marks : 80+20

Answer any four Questions. All questions carry equal marks.

SECTION-A

1. Write a Program using Servlet and JDBC for developing online application for displaying results of MCA Program. A student has to score 50 % in theory, practical and assignment to qualify the paper. Create appropriate databases.
2. Write a JSP Program, which displays a web page containing the name of the school, program being offered currently, number of students enrolled in each program, new programs to be offered, eligibility criteria for taking admission in each program.
3. Write a program using JDBC and JSP to display the names and addresses of all those MCA students who are working in Software Development Company.

SECTION-B

4. Write a program in C or C++ demonstrate Bresenham's Line generation algorithm ?
5. Write a program in C or C++ to produce the sweep representation of a circle and hence produce a cylinder ?

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