NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–I
(Problem Solving Using C)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define algorithm. What is the need of writing an algorithm? Write an algorithm for generating the series of first 10 prime numbers.

2. What is a flowchart? Describe the symbols used in a flowchart. Draw a flowchart to check whether the given year is a leap year (February with 29 days) or not.

3. Differentiate between **do-while loop and while loop** with the help of an example. Can we use multiple types of looping statements in the same program? Explain.

4. What are datatypes in C. Discuss various datatypes used in C programming with examples?

5. Define Array. How it is different from pointers? Write a program using array and pointers.

6. Differentiate between iteration and recursion giving an appropriate example for each. Explain call-by-value and call-by-reference concept in C.

7. What is a storage class? Explain different types of storage class with examples of each.

8. Differentiate between Union and structure. Give examples for each

9. Write a program in C to display the sum of the squares of the first 10 odd numbers. Explain each step of the program.

10. Write short notes on the following:—
    (a) Keywords in C
    (b) Decision making statements in C

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EXAMINATION PROGRAMME-2022
MCA, Part-I

Date	Papers	Time	Examination Centre
10.11.2022	Paper–I	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
12.11.2022	Paper–II	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
15.11.2022	Paper–III	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
17.11.2022	Paper–IV	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
19.11.2022	Paper–V	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
22.11.2022	Paper–VI	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
24.11.2022	Paper–VII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
26.11.2022	Paper–VIII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
28.11.2022	**Paper–I (Practical)**	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
29.11.2022	**Paper–VI (Practical)**	**11.30 AM to 1.30 PM**	
30.11.2022	**Paper–VIII (Practical)**	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–II
(Computer Organization)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Convert the following:—
   (i) (9ABD9F)16 = ( )8
   (ii) (1100111001100010)2 = ( )10
   (iii) (64379)10= ( )2
   (iv) (523176)8 = ( )16

2. Draw all the fundamental gates with their truth tables and Karnaugh map. What is Don't Care condition?

3. Simplify the following using Karnaugh's map in terms of SOP and draw the circuit for the output expression: F (A, B, C, D) = ∑(2, 4, 6, 8, 10, 11, 12, 14, 15)

4. Simplify the expressions and draw the circuit diagram for the expressions given below:
   (i) A'B'CD'+ AC'+ CD'+ A'BC + (ABC)'
   (ii) BCD + ACD + A'B'C'+ (AC)' + ABCD

5. What are universal gates? Draw all the fundamental gates using the universal gates.

6. Differentiate between D flip-flop and T-flip flop. Draw their circuit diagrams and write their characteristic expressions.

7. What is the need of secondary storage in Computers? Describe various types of secondary storage in computers and their accessing methods.

8. What is Direct Memory Access (DMA)? Draw the block diagram of DMA and discuss its function.

9. Describe the basic structure of CPU. Discuss some of the common flags or condition codes used in status registers of CPU.

10. Write short notes on any two of the following:—
    (a) SR Flip flop
    (b) ROM
    (c) Control Unit
    (d) Interrupts.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–III
(Discrete Mathematics)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. (a) Define the tautology and prove that $\sim (p \wedge q) \equiv \sim p \vee \sim q$.
   (b) Write the truth table for $p \wedge (q \vee r)$.

2. Show that $\frac{1}{1.2} + \frac{1}{2.3} + - - - + \frac{1}{n(n+1)} = \frac{n}{n+1}$ by mathematical Induction.

3. Explain the OR Gate, AND Gate, NOT Gate, NAND Gate.

4. (a) Define the following :—
   (i) Finite Set (ii) Power Set
   (iii) Proper Subset (iv) Universal Set
   (b) If $A = \{x \mid x \in N \text{ and } x < 3\}$, $B = \{x \mid x^2 - 16 = 0 \text{ and } x < 0\}$. Find B × A where N is a set of natural number.

5. (a) How many words can be formed from the letters of work 'PRODUCT' provided at least three letters appears.
   (b) If $2n_{c3} : n_{c2} = 44 : 3$. then find the value of n.

6. (a) Find the 3rd term in the expansion of $(2x - 3y)^5$.
   (b) Find the middle term in the expansion of $(1 + x)^{2n}$.

7. If $P(A) = \frac{1}{4}$, $P(B) = \frac{2}{5}$ and $P(A \cup B) = \frac{1}{2}$. Find the value of the following probability
   (i) $P(A \cap B)$ (ii) $P(A \cap B')$ (iii) $P(A' \cup B')$

8. If books are to be kept in 4 shelves. There must be atleast one shelf which contain at least 3 books.

9. Find the remainder when $(53)^{49}$ is divided by 36.

10. What is the chance that a leap year selected at random will contain (i) 53 Sunday (ii) 53 Thursday or 53 Friday.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–IV
(Communication Skills)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer all Questions.

1. Read the following passage and answer the questions given below :—

All conversation consist of speaking and listening. We engage in these activities so often that we do them without giving much conscious thought of how we do them. In its simplest form, speaking is putting ideas into words. It is almost always accompanied by non-verbal behaviour that supplements, contradicts and reinforces the verbal message. Talking effectively in a typical organizational setting requires well developed language skills. People tend to judge one another's abilities by the way they talk. In addition to a well-developed vocabulary and confidence is using standard English, being good at talking, whether in informal hallway conversations or in more formal settings, requires sensitivity to the pace, tone and pitch of oral delivery as well as to the non verbal behaviours of the listener or listeners.

(a) What does conversation comprise ? 5

(b) What are types of conversation ? 5

(c) How do people judge one's abilities ? 5

(d) Say whether the following statements are true or false :– 5

(i) Is conversation comprised of only speaking ?

(ii) Speaking is putting ideas into words.

(iii) Is conversation accompanied by non-verbal behaviour ?

(iv) People evaluate one another's abilities by talk.

(v) Non-verbal behaviour reinforce the verbal message.

2. What are the factors responsible for the growing importance of communication? 10

3. Write a note on advantage and disadvantages of Multimedia. 10

4. Explain characteristics and of group discussion benefits. 10

5. How does culture affect communication? 10

6. Why is it important to produce effective documents in a business context ? 10

7. Define communication and highlight its importance. 10

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–V
(Systems Analysis and Design)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What is the concept of System Analysis and design? Discuss the constraints and characteristics of a system.

2. Explain different types of systems with examples.

3. Describe the symbols used to draw a Data Flow Diagram (DFD). Draw a DFD and develop SRS for School Management System.

4. What is maintenance of a software system? Why it is required? Describe different types of maintenance with examples.

5. Discuss the issues involved in Feasibility study of a system. What is Prototyping?

6. What are the rules for specifying Software requirements? Discuss some of the standards for documentation. What ae the good practices of documentation?

7. What Fact finding techniques will you use to develop a Software for Admission system of your University? Explain with the help of an example.

8. Define E-R diagram. What are the components of an E-R diagram? Describe the symbols used in E-R model and their significance with the help of an example.

9. Define System Testing. Explain the concept of Test plan and Test case design. Discuss different types of testing methods with examples.

10. Write short notes on any two of the following:—
    (i) SDLC
    (ii) Attributes of System Analyst
    (iii) Cohesion
    (iv) Conversion method of Software system.

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EXAMINATION PROGRAMME-2022
MCA, Part-I

Date	Papers	Time	Examination Centre
10.11.2022	Paper–I	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
12.11.2022	Paper–II	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
15.11.2022	Paper–III	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
17.11.2022	Paper–IV	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
19.11.2022	Paper–V	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
22.11.2022	Paper–VI	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
24.11.2022	Paper–VII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
26.11.2022	Paper–VIII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
28.11.2022	**Paper–I (Practical)**	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
29.11.2022	**Paper–VI (Practical)**	**11.30 AM to 1.30 PM**	
30.11.2022	**Paper–VIII (Practical)**	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–VI
(Operating System Concepts and Networking Management)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define an operating system. Discuss different types of Operating System.

2. Discuss the structure of UNIX operating system with the help of a diagram. Explain the features of User mode and Kernel mode in UNIX operating system.

3. Explain DMA (Direct Memory Access). How it is useful in bulk data transfer?

4. What is Process Control Block (PCB)? What type of information is kept in a PCB? Explain.

5. What is a process? Explain the different states of a process.

6. Explain OSI model of Networking with the functions of each layer.

7. List and explain the significance and uses of any five networking devices.

8. Explain the following terms with examples:
   (a) Context Switching in Operating System (b) Transmission Media

9. Write the use of following LINUX commands and their complete syntax, with an example for each :—
   (a) cat (b) kill (c) grep (d) pwd (e) chmod

10. Write the short notes on any two of the following:—
    (a) Virtual machine
    (b) Firewall
    (c) Domain Name System
    (d) IP Adress

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EXAMINATION PROGRAMME-2022
MCA, Part-I

Date	Papers	Time	Examination Centre
10.11.2022	Paper–I	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
12.11.2022	Paper–II	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
15.11.2022	Paper–III	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
17.11.2022	Paper–IV	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
19.11.2022	Paper–V	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
22.11.2022	Paper–VI	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
24.11.2022	Paper–VII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
26.11.2022	Paper–VIII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
28.11.2022	**Paper–I (Practical)**	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
29.11.2022	**Paper–VI (Practical)**	**11.30 AM to 1.30 PM**	
30.11.2022	**Paper–VIII (Practical)**	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–VII
(Object Oriented Analysis and Design)
Annual Examination, 2021

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Explain Object Oriented Analysis process in detail with the help of an example.

2. Discuss different types of inheritance with examples. What is abstraction?

3. What is Polymorphism? Differentiate between operator overriding and operator overloading.

4. Explain the terms Aggregation, Composition, Generalization and Specialization. Give examples for each.

5. Draw a DFD for the 'University Examination System". Assumptions can be made wherever necessary. Draw the DFD's up to second level.

6. Define Inheritance. Explain different types of Inheritance with examples.

7. Draw a use-case diagram of your own choice and explain all its components. How are constraints defined and implemented?

8. What is concurrency? How is it identified? What are the issues, mechanisms and methods to manage concurrency?

9. List and describe the elements of a State Diagram. Give an example of state diagram.

10. Write short notes on any **Two** of the following: —
    (a) Encapsulation
    (b) Object
    (c) Testing in OOAD
    (d) Coupling and cohesion.

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-:REVISED:-
Annual PRACTICAL EXAMINATION PROGRAMME-2021
MCA, Part-I
Venue : Nalanda Open University, School of Computer Education & IT,
12th Floor, Biscomaun Tower, Patna-800001

Enrollment No.	Date	Papers	Time
All New & Old Students	**25.05.2022**	Paper–I (Practical)	11.30 AM to 1.30 PM
All New & Old Students	**27.05.2022**	Paper–VI (Practical)	11.30 AM to 1.30 PM
All New & Old Students	**30.05.2022**	Paper–VIII (Practical)	11.30 AM to 1.30 PM

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–VIII
(Data and File Structures)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What are the basic criteria's that an algorithm must satisfy? Explain algorithm complexity with the help of an example.

2. Define Array. Write a program in C to find the sum of two matrices using array.

3. What are the advantages of Linked lists over arrays? Differentiate between doubly linked list and Circular linked list with the help of an example.

4. Define Enqueue and Dequeue operation? Write a C program to implement Enqueue and Dequeue.

5. Discuss different types of search methods used in data structure with an example of each type.

6. Write a procedure to sort the following sequence using merge sort:–

   10, 5, 15, 30, 17, 60, 55, 45, 35, 28.

7. Define Tree. Describe the important components of tree. Write an algorithm to implement binary tree.

8. What is Heap Tree? Explain Max heap and Min heap construction and deletion algorithms with examples.

9. What is hashing? Explain division remainder method and collision resolution method.

10. Write short notes on any two of the following:
    (a) Asymptotic Notations
    (b) Stack
    (c) File organisation
    (d) ISAM

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-:REVISED:-
Annual PRACTICAL EXAMINATION PROGRAMME-2022
MCA, Part-I
Venue : Nalanda Open University, School of Computer Education & IT,
12th Floor, Biscomaun Tower, Patna-800001

Enrollment No.	Date	Papers	Time
210190001 to 210190072	28.11.2022	Paper–I (Practical)	11.30 AM to 1.30 PM
210190073 to 210190144 & All Old Students	28.11.2022	Paper–I (Practical)	2.30 PM to 4.30 PM
210190001 to 210190072	29.11.2022	Paper–VI (Practical)	11.30 AM to 1.30 PM
210190073 to 210190144 & All Old Students	29.11.2022	Paper–VI (Practical)	2.30 PM to 4.30 PM
210190001 to 210190072	30.11.2022	Paper–VIII (Practical)	11.30 AM to 1.30 PM
210190073 to 210190144 & All Old Students	30.11.2022	Paper–VIII (Practical)	2.30 PM to 4.30 PM

SET-I

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–I
Problem Solving using C (Computer Practical)
Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer any two questions. All questions carry equal marks.

1. Write a program in C language to display whether the given year is leap year or not.

2. Write a program to generate the following pattern below:
   ******
   ****
   **

3. Write a program in C language to compute the average of first 10 even numbers.

SET-II

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–I
Problem Solving using C (Computer Practical)
Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer any two questions. All questions carry equal marks.

1. Write a program in C to print the cube of first 10 Natural numbers.

2. Write a program to generate the following pattern below:
   **
   ****
   ******

3. Write a program in C language to print the sum of 10 odd numbers.

SET-I

NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-I

PAPER–VI

Operating System concepts and Networking Management (Computer practical)

Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the questions. All questions carry equal marks.

1. Write a shell program to find the sum and average of first "n" odd numbers.

2. List and execute the following UNIX commands:
   (a) To display the content of a file.
   (b) To display the top 10 lines of the file.
   (c) To count no. of words in a given text file.
   (d) To search the pattern ”abc” in the text file.
   (e) To list the content of the directory with all information.

SET-II

NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-I

PAPER–VI

Operating System concepts and Networking Management (Computer practical)

Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the questions. All questions carry equal marks.

1. Write a shell program to find the sum and average of first "n" natural numbers.

2. List and execute the following UNIX commands:
   (a) To create a file.
   (b) To stop any process using PID.
   (c) To count no. of lines in a given text file.
   (d) To create a file in a sub-directory with name abc.txt.
   (e) To change the read and write permission of the file.

SET-I

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–VIII
Data and File Structure (Computer practical)
Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the questions. All questions carry equal marks.

1. Write a program in 'C' language for implementation of various operation on a queue.

2. Write a program in 'C' language to implement binary tree.

SET-II

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-I
PAPER–VIII
Data and File Structure (Computer practical)
Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the questions. All questions carry equal marks.

1. Write a program in 'C' language for the implementation deletion from a queue.

2. Write a program in 'C' language for the multiplication of two matrices using arrays.

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–IX
(Internet Concepts and Web Design)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define Internet. What basic components are required to avail internet services? Discuss use of internet in different application areas.
2. What is ISP? Differentiate between Intranet and extranet.
3. Differentiate between Static web page and dynamic web page. Give an example of Dynamic website.
4. Explain the concept of web designing, development and publishing in detail.
5. What do mean by web-browser? Explain web server, website, webpage and addressing system of web-address.
6. Discuss the architecture of Proxy Server?
7. Define HTML. Describe various HTML tags. Explain the difference between HTML and DHTML with examples.
8. Define Java script. Differentiate between language and common programming language with examples.
9. What is a Style sheet? Discuss the properties of Style sheet.
10. Write short notes on any **two**:
    (i) IP addressing
    (ii) FTP
    (iii) URL
    (iv) Email.

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EXAMINATION PROGRAMME-2022
MCA, Part-II

Date	Papers	Time	Examination Centre
28.01.2023	Paper–IX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
30.01.2023	Paper–X	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
01.02.2023	Paper–XI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
03.02.2023	Paper–XII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
09.02.2023	Paper–XIV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
11.02.2023	Paper–XV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
13.02.2023	Paper–XVI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
14.02.2023	Paper-IX (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
15.02.2023	Paper–XIII (Practical)	**11.30 AM to 1.30 PM**	
16.02.2023	Paper–XIV (Practical)	**11.30 AM to 1.30 PM**	
17.02.2023	Paper-XV (Practical)	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–X
(Computer Graphics and Multimedia)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What are the applications of Computer? Describe CAD and CAM processes in computer graphics.
2. What is a graphic package? Explain Graphic pipeline, pixels and frame buffer.
3. Discuss various software tools used for Image processing.
4. Explain various clipping methods with examples.
5. Explain Translation, Rotation and Scaling in terms of two dimensional (2D) transformation.
6. Define Graphical Kernel System (GKS). Discuss GKS standards and GKS Inputs.
7. What is projection? Explain different types of projections with examples.
8. Explain Depth Buffer (Z-Buffer) method and Scan line method.
9. Discuss local illumination and global illumination. Also explain different types of shading.
10. Write short notes on any two of the following:—
    (i) Scientific Visualization
    (ii) Input devices
    (iii) Morphing
    (iv) Tweening.

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EXAMINATION PROGRAMME-2022
MCA, Part-II

Date	Papers	Time	Examination Centre
28.01.2023	Paper–IX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
30.01.2023	Paper–X	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
01.02.2023	Paper–XI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
03.02.2023	Paper–XII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
09.02.2023	Paper–XIV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
11.02.2023	Paper–XV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
13.02.2023	Paper–XVI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
14.02.2023	Paper-IX (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
15.02.2023	Paper–XIII (Practical)	**11.30 AM to 1.30 PM**	
16.02.2023	Paper–XIV (Practical)	**11.30 AM to 1.30 PM**	
17.02.2023	Paper-XV (Practical)	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XI
(Software Engineering)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What is layered approach of Software engineering? Explain.

2. Define and describe analysis and design phase of Software engineering.

3. Define project. Explain project communication management and configuration management.

4. Compare and contrast Waterfall model and Spiral model. Discuss the advantages of both the models.

5. What is Risk? What are different types of Risk? Explain the process of Risk management.

6. Describe types of requirements used in software engineering. What is requirement gathering?

7. Define and describe Capability Maturity model (CMM). What are software standards?

8. Explain various types of coupling and cohesion in terms of modularization.

9. What are the golden rules for User Interface design? Explain.

10. Write short notes on any **two** of the following:—
    (i) Umbrella activities
    (ii) DFD
    (iii) Software quality
    (iv) Types of software.

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XII
(Management and Information System)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Explain classification of Information based on characteristics and application. Discuss the attributes of Information.

2. Discuss Information system architecture with examples.

3. Explain various types of Information Systems with the help of an example.

4. What are the six key elements required for designing an organizational structure? Explain.

5. Define MIS. Discuss the application of MIS in detail. Discuss the factors that contribute to the success of MIS.

6. Explain the concept of Function oriented organization and Process oriented organization with examples.

7. What is Supply chain management? How Information systems can facilitate supply chain management.

8. Define DBMS. Discuss different types of DBMS.

9. What are the benefits and challenges of Enterprise systems? Discuss.

10. Write short notes on any **two** of the following: —
    (i) Quality of information
    (ii) Data mining
    (iii) Data warehouse
    (iv) Types of system.

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Revised
EXAMINATION PROGRAMME-2022
MCA, Part-II

Date	Papers	Time	Examination Centre
28.01.2023	Paper–IX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
30.01.2023	Paper–X	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
01.02.2023	Paper–XI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
03.02.2023	Paper–XII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
09.02.2023	Paper–XIV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
11.02.2023	Paper–XV	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
13.02.2023	Paper–XVI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
14.02.2023	Paper-IX (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
15.02.2023	**Paper–XIII (Practical)**	**02.30 PM to 05.30 PM**	
16.02.2023	Paper–XIV (Practical)	**11.30 AM to 1.30 PM**	
17.02.2023	Paper-XV (Practical)	**11.30 AM to 1.30 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XIII
(Operating System)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define Operating System. Describe the functions of Operating system. Discuss different types of Operating System.

2. What are the services provided by the operating system? Discuss Windows operating system.

3. What is a process? Explain in detail the functions of process management in operating system.

4. Explain different types of schedulers. What are the different criteria's of scheduling?

5. Define Semaphore. Explain Classical problems in concurrent programming.

6. Define deadlock. Discuss four conditions for deadlock. How can deadlock be avoided?

7. What is page replacement policy? Discuss FIFO and Priority based algorithm with the help of an example.

8. Compare and contrast between Paging and Segmentation. Explain the concept of Overlays and swapping.

9. Define UNIX. Write at least ten commands in UNIX and explain their functions.

10. Write short notes on any two of the following:—
    (i) Process States
    (ii) Locks
    (iii) Windows 2000 architecture
    (iv) Memory hierarchy.

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Revised

EXAMINATION PROGRAMME-2022
MCA, Part-II

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XIV
(Database Management Systems)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define DBMS. What is the need of DBMS? Discuss the advantages and disadvantages of DBMS.

2. Describe the basic components of E-R diagram? Draw an E-R diagram for school management system.

3. Write at least ten queries in SQL with their complete syntax and meaning.

4. What are different types of Functional dependencies? Explain each one of them with the help of examples.

5. What do you understand by the term "Normalization" in DBMS? Explain 3rd normal form with the help of an example.

6. Define serializability. Explain various Locking techniques in transaction processing.

7. Explain the following terms with suitable example: —
   (i) Lossless decomposition.
   (ii) Dependency preserving decomposition.

8. Discuss various data security issues in DBMS.

9. Compare and contrast between OODBMS and RDBMS.

10. Write short notes on any two of the following:—
    (i) Indexes in DBMS
    (ii) Integrity Constraints.
    (iii) Relational algebra
    (iv) Views in DBMS.

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EXAMINATION PROGRAMME-2022

MCA, Part-II

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XV
(Object Oriented Programming using Java)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define Object Oriented Programming (OOPs)? Explain the properties of OOPs.

2. Discuss different types of data types in Java with examples.

3. Describe at least 10 keywords used in Java with their functions.

4. Discuss the Control statements in Java. Give some examples

5. What is an exception? Explain difference between checked and unchecked exceptions with an example of each. What is the difference between throw and throws keywords used in Java? Explain with an example.

6. What is an array? Explain one dimension and two dimension arrays with an example in Java.

7. Write a class complex to represent complex numbers, with suitable constructor and function to find the sum of two complex numbers.

8. Define Package. Explain CLASSPATH, Package naming and accessibility of packages with examples.

9. What do you mean by multithreading? Explain the lifecycle of a thread. Compare an contrast between a thread and process.

10. Write short notes o any **two** of the following:
    (i) Servlet
    (ii) Constructors in Java
    (iii) File handling in Java
    (iv) Types of statements in Java.

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EXAMINATION PROGRAMME-2022
MCA, Part-II

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-II
PAPER–XVI
(Computer Networking)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Explain OSI model of network. What the advantages of dividing the network into layers?

2. Define LAN. Describe the characteristics that differentiate one LAN from another. Explain various topologies of LAN with their advantages and disadvantages.

3. Describe different types of transmission media with examples.

4. Define Modulation. Discuss different types of modulations with diagram.

5. Explain various protocols of Data link layer with examples. What is pipelining?

6. Explain various network devices used at different layers of OSI model.

7. What is switching? Explain circuit switching, message switching and packet switching.

8. Explain the reasons of Network congestion. How this congestion problem can be corrected?

9. What are different types of encryption techniques? Explain at least two of them briefly.

10. Write short notes on any **two** of the following: —
    (i) Transmission impairments
    (ii) Transmission modes
    (iii) ISP (Internet Service provider.

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EXAMINATION PROGRAMME-2022
MCA, Part-II

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–IX - Practical

(Internet Concepts and Web Design)

Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the Questions. All questions carry equal marks.

1. Create the following table in HTML with Dummy data (Five records) :

Enrolment no.	Course code	Registration no.	Course Fee	Remarks.

2. Write a JavaScript NB Script code to create a pull down menu box.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–IX - Practical

(Internet Concepts and Web Design)

Annual Examination, 2022

Time : 2 Hours. **Full Marks : 20**

Answer all the Questions. All questions carry equal marks.

1. Create the following table in HTML with Dummy data (Five records) :

Enrolment no.	Course code	Registration no.	Course Fee	Remarks.

2. Write a JavaScript NB Script code to create a pull down menu box.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XIII [Practical]

(Operating System)

Annual Examination, 2022

Time : 2 Hours. **SET–A** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Define Operating System. Discuss the structure of UNIX Operating System.
2. Write 10 UNIX Command with their syntax and functions.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XIII [Practical]

(Operating System)

Annual Examination, 2022

Time : 2 Hours. **SET–B** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Define Operating System. Discuss the file system of UNIX Operating System.
2. Write 10 UNIX Command with their syntax and functions.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XIV [Practical]

(Database Management System)

Annual Examination, 2022

Time : 2 Hours. **SET–A** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Write at least 10 SQL Commands with their syntax and functions.

2. What is an E-R diagram? Draw an E-R diagram for "School Management System".

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XIV [Practical]

(Database Management System)

Annual Examination, 2022

Time : 2 Hours. **SET–B** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Write at least 10 SQL Commands with their syntax and functions.

2. What is an E-R diagram? Draw an E-R diagram for "Library Information System".

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XV [Practical]

(Object Oriented Programming Using Java)

Annual Examination, 2022

Time : 2 Hours. **SET–A** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Explain the properties of Object Oriented Programming Languages.

2. Write a program in Java to implement inheritance.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-II

PAPER–XV [Practical]

(Object Oriented Programming Using Java)

Annual Examination, 2022

Time : 2 Hours. **SET–B** **Full Marks : 20**

Answer all the Questions.
All questions carry equal marks.

1. Discuss various data types used in Java programming with examples.

2. Write a program in Java to implement polymorphism.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XVII
(Accounting and Financial Management)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Discuss the role of accountants in modern business organization.
2. What is working capital ? Describe its sources.
3. Define dividend. Discuss the different forms of dividend.
4. What is financial accounting ? Distinguish financial accounting from management accounting.
5. What is accounting standard ? Discuss the need of accounting standard.
6. What is Final Account ? What are its objectives ? Describe the components of Final Account.
7. What is fund flow statement ? How it is prepared ? Give an example.
8. Discuss the objectives and goals of financial management.
9. Write notes on any ***Two*** of the following :—
   (a) Negotiable Instruments.
   (b) Inventory Management.
   (c) Ratio Analysis.
10. Calculate the following ratios with imaginary figures :—
    (a) Net Profit Ratio (b) Operating Ratio
    (c) Current Ratio (d) Stock Turnover Ratio
    (e) Debt Equity Ratio (f) Proprietary Ratio

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EXAMINATION PROGRAMME-2022
MCA, Part-III

Date	Papers	Time	Examination Centre
28.01.2023	Paper–XVII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
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03.02.2023	Paper–XX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XXI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
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18.02.2023	Paper-XVII (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University, School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
20.02.2023	Paper–XXIII (Practical)	**11.30 AM to 1.30 PM**	
21.02.2023	Paper–XXIV (Project)	**11.30 AM onwards**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XVIII
(Advanced Database Management System)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. What are Enhanced ER tools? Construct an E-R diagram for a University admission System.

2. Explain different normal forms with examples. Why normalization of database required?

3. Differentiate between Multivalued dependency and Join Dependency with help of an example.

4. What is UML? Discuss the features of automated database design and implementation tools.

5. What are the steps for design of database system? Explain in detail.

6. What are recovery algorithms in database? Explain using a suitable example.

7. What is a data dictionary? Describe its features. Discuss the advantages and disadvantages of data dictionary.

8. What are the basic steps in query processing? How can the cost of query be measured? Write at least 10 SQL commands with their complete syntax.

9. Discuss some of the traditional and advanced transaction processing methods.

10. Write short notes on any **two**:
    (i) Lock based protocol
    (ii) Applications of DBMS
    (iii) Database security
    (iv) Concurrency.

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EXAMINATION PROGRAMME-2022
MCA, Part-III

Date	Papers	Time	Examination Centre
28.01.2023	Paper–XVII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XIX
(Compiler Design)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Describe the structure of a compiler. What is the role of compiler in computers?
2. What is lexical analysis? What is its importance in compiler design?
3. What is the concept of passes in Compiler? Explain single pass and multi-pass compiler.
4. Describe Lex and Yacc tool. Why are they used?
5. What is a regular expression? Write at least 10 regular expressions and the languages formed by them.
6. Define Finite state machine. Differentiate between DFA and NFA.
7. What is Parsing? Explain the concept of backtracking with the help of an example.
8. Discuss Ambiguity with the help of an example. Compare and contrast between LL and LR with examples
9. Describe various attributes of grammar with examples.
10. Write short notes on any **two**:
    (i) Symbol Table
    (ii) Memory allocation
    (iii) Linker/Loader
    (iv) Parse Tree.

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EXAMINATION PROGRAMME-2022
MCA, Part-III

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28.01.2023	Paper–XVII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
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21.02.2023	Paper–XXIV (Project)	**11.30 AM onwards**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XX (New)
(Design and Analysis of Algorithms)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define Algorithm. Write an Algorithm to generate the series of prime numbers up to given n terms.

2. Explain various criteria for analyzing algorithms. Describe the concept of space and time complexity of an Algorithm with the help of an example.

3. Explain Matrix chain multiplication and Longest Common Sequence with the help of an example.

4. Explain Kruskal's method for finding Minimum Spanning tree of a Graph. Compare Prim's method with Kruskal's Method with example.

5. Differentiate between P, NP and NP complete problem with the help of an example.

6. Explain Floyd-Warshall algorithm with proper examples.

7. Explain Chinese remainder theorem with example

8. Discuss in detail Number Theoretic Algorithms with examples. What is Approximation algorithm?

9. Discuss about the random variables and basic inequalities with an example. Define the distribution function for the random variables.

10. Write short notes on any **two** of the following:
    (i) Greedy algorithms
    (ii) Dynamic programming
    (iii) String matching.
    (iv) Depth First Search

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Revised
EXAMINATION PROGRAMME-2022
MCA, Part-III

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03.02.2023	Paper–XX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XXI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
09.02.2023	Paper–XXII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
11.02.2023	Paper–XXIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
20.02.2023	Paper-XVII (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University, School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
22.02.2023	Paper–XXIII (Practical)	**11.30 AM to 1.30 PM**	
23.02.2023	Paper–XXIV (Project)	**11.30 AM onwards**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XXV [Old]
(MCS-53 : Computer Graphics and Multimedia)
Annual Examination, 2021

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Differentiate between Computer Graphics and Animation. What is Random Scan display device?

2. Write Bresenham's line generation algorithm. Use it to draw a line segment joining (20, 10) and (25, 14).

3. Write midpoint circle drawing algorithm. Use it to draw a circle C having entre (5, 2) and radius = 10.

4. Explain different Shading Schemes with their advantages and disadvantages.

5. How are frame buffers used to control color and intensity of any image? You are required to support your answer with suitable diagrams and bit plane tables.

6. Discuss different types of projection with diagram.

7. Define DDA algorithm. Write DDA line drawing algorithm. Use this algorithm to draw a line between (0,0) and (3,3).

8. Explain the following terms: – (i) Z Buffer (ii) Aspect Ratio (iii) Video Conferencing (iv) Ambient light.

9. What is authoring tool? Explain different types of authoring tools.

10. Write short notes on any **Three** of the following:—
    (i) Vector graphics
    (ii) JPEG and GIF
    (iii) Ray Casting
    (iv) Hypermedia.

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EXAMINATION PROGRAMME-2021
MCA, Part-III [Old Batch]

Date	Papers	Time	Examination Centre
28.07.2022	Paper–XXI	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
30.07.2022	Paper– XXII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
01.08.2022	Paper– XXIV	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
03.08.2022	Paper–XXV	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
05.08.2022	Paper–XXVII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
06.08.2022	Paper–XXVIII	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
08.08.2022	Paper–XXIX	2.30 PM to 5.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
23.08.2022	**Paper–XXIII (P)**	**12.00 Noon to 3.00 PM**	**School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
24.08.2022	**Paper–XXVI (P)**	**12.00 Noon to 3.00 PM**	
25.08.2022	**Paper–XXX (Tentative)**	**12.00 Noon to 3.00 PM**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XXI
(Artificial Intelligence and Knowledge Management)
Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define Intelligence. What are components of Intelligence? Discuss different types of Intelligence.

2. What is learning? How does it support Intelligence? Explain different types of learning.

3. What is searching in AI? Discuss the concept of Informed and Uninformed search with examples.

4. Differentiate between Breadths First Search (BFS) and Depth First Search (DFS). Discuss the advantages and disadvantages of both the searching techniques.

5. Explain A * Search (AND graph) with the help of an example. What are the desirable properties of heuristic search algorithms?

6. Define Game. What are the components of a game? Discuss MIN-MAX search procedure with the help of example.

7. Explain tautology and contradiction in propositional logic with examples. What is invalid formula?

8. Discuss the concept of Semantic Network, Frame Structure and Scripts in Artificial Intelligence with examples.

9. Define and describe fuzzy set. Explain Union, Intersection and Complement of Fuzzy Set with the help of an example.

10. Write short notes on any two of the following:—
    (i) Application area of AI
    (ii) Conceptual dependency
    (iii) Hill climbing
    (iv) Inference rules.

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Revised
EXAMINATION PROGRAMME-2022
MCA, Part-III

Date	Papers	Time	Examination Centre
28.01.2023	Paper–XVII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
30.01.2023	Paper–XVIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
01.02.2023	Paper–XIX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
03.02.2023	Paper–XX	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
07.02.2023	Paper–XXI	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
09.02.2023	Paper–XXII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
11.02.2023	Paper–XXIII	10.30 AM to 1.30 PM	Nalanda Open University, 2nd Floor, Biscomaun Bhawan, Patna
20.02.2023	Paper-XVII (Practical)	**11.30 AM to 1.30 PM**	**Nalanda Open University, School of Computer Education & IT, 12th Floor, Biscomaun Tower, Patna-800001**
22.02.2023	Paper–XXIII (Practical)	**11.30 AM to 1.30 PM**	
23.02.2023	Paper–XXIV (Project)	**11.30 AM onwards**	

NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XXII
(Numerical and Statistical Computing)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks. Calculator is allowed.

1. (a) Define (i) Floating Point, (ii) Absolute Error, (iii) Relative Error, (iv) Truncation Error.
   (b) Round-off the number 4.5126 to four significant figures and find the relative error and percentage error.

2. (a) Use secant method to find the roots of the equation $f(x) = 0.5e^x - 5x + 2$.
   (b) Obtain the smallest positive root of $x^3 + x - 2 = 0$, correct to 2 decimal places with the help of Bisection formula.

3. Solve the following linear system of equations

$$x_1 + x_2 + x_3 = 3$$
$$4x_1 + 3x_2 + 4x_3 = 8$$
$$9x_1 + 3x_2 + 4x_3 = 7$$

using the Gauss Elimination method.

4. Solve by Jacobi's method of the following system of linear equations

$$2x_1 - x_2 + x_3 = -1$$
$$x_1 + 2x_2 + x_3 = 21$$
$$3x_1 - 7x_2 + 5x_3 = 9$$

5. From the following data estimate the value of f(2.25) using forward difference formula.

x	0	0.5	1.0	1.5	2.0	2.5
f(x)	1.0	3.625	7.000	11.875	19.000	29.125

6. Evaluate the Integral $I = \int_0^1 \frac{dx}{1+x}$ using Gauss Legendre three point formula.

7. Explain Binomial and Poisson distribution.

8. (a) Evaluate the Integral $\int_0^6 (x^2 + 3x + 2)dx$ using Trapezoidal rule with $h = 1.0$.

   (b) Evaluate the Integral $\int_1^4 x^5\,dx$ using Weddle's rule with $h = 0.5$.

9. Using Runga Kutta method of order 4, find y(0.2) given that $y' = 3x + \frac{y}{2}$, y(0) = 1 taking h = 0.1.

10. Explain normal distribution and Chi-square distribution.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XXVIII (Old)
(Numerical and Statistical Computing)
Annual Examination, 2020

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks. Calculator is allowed.

1. (a) Define (i) Floating Point, (ii) Absolute Error, (iii) Relative Error, (iv) Truncation Error.
   (b) Round off the following numbers to four significant digits.
   (i) 643.92 (ii) 98.32143 (iii) 7.2565 (iv) 6.4155 (v) 0.700132

2. (a) Show that the equation $x^3 - 6x - 1 = 0$, has a root in the interval (–1, 0). Obtain this root using the successive iteration method.
   (b) Obtain the smallest positive root of $x^3 + x - 2 = 0$, correct to 2 decimal places with the help of Bisection formula.

3. Solve the following linear systems of equations using the Gauss Elimination method
$$3x_1 + 2x_2 + 3x_3 = 5$$
$$x_1 + 4x_2 + 2x_3 = 4$$
$$2x_1 + 4x_2 + 8x_3 = 8$$

4. Solve the Jacobi's method of the following system of linear equations
$$2x_1 - x_2 + x_3 = -1$$
$$x_1 + 2x_2 + x_3 = 21$$
$$3x_1 - 7x_2 + 5x_3 = 9$$

5. Obtain the estimate of the missing figure in the following table :—

x	1	2	3	4	5	6	7	8	9
f(x)	1	4	9	–	25	–	49	64	81

6. Estimate the sale of a particular quantity for 1935 using the following table :—

Year	1931	1941	1951	1961	1971	1981
Sales (in thousands)	25	33	39	47	59	68

7. Evaluate the Integral $I = \int_0^1 \frac{dx}{1+x}$ using Gauss Legendre three point formula.

8. (a) Evaluate the Integral $\int_0^6 (x^3 + 2x + 3)dx$ using Trapezoidal rule with $h = 1.0$.

   (b) Evaluate the Integral $\int_1^4 x^4\,dx$ using Weddle's rule with $h = 0.5$.

9. Using Runga Kutta method of order 4, find y(0.2) given that $y' = 3x + \frac{y}{2}$, y(0) = 1 taking h = 0.1.

10. Explain Binomial and Poisson distribution.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-III

PAPER–XXIII

(Application Development with .Net Framework)

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 80**

Answer any Five Questions.
All questions carry equal marks.

1. Define event driven programming. Discuss the advantages and disadvantages.

2. Explain the process of working with form controls in .Net. Discuss exception handling with an example?

3. Explain different Web Server Controls. What is user controls.

4. Discuss event handling with web server. What are list controls? Explain.

5. Explain the state management technique of web page.

6. Explain Web Form Life Cycle in details.

7. Describe the design features of .Net framework. Discuss .Net class library.

8. Explain the features of Object Oriented Programming concepts. List and explain the types of access modifiers.

9. What is Query String? Explain it using an example. Discuss the limitations of Query String.

10. Write short notes on any **two** of the following:–
    (i) Role of Cookies
    (ii) Delegates
    (iii) ASP.Net features.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XVII (New) - Practical
(Accounting and Financial Management)

SET-A

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 20**

Answer any Two Questions. All questions carry equal marks.

1. Give Journal Entries from the following transaction :—
   (i) Ram introduced a capital of Rs. 4,00,000.
   (ii) Purchased a goods of Rs. 49,000 from Das & Co.
   (iii) Sold goods to Rahim Rs. 1,50,000.
   (iv) Sold goods for Cash Rs. 60,000.
   (v) Salary paid Rs. 8,000.
   (vi) Purchased a Machinery Rs. 80,000.
   (vii) Rent payable Rs. 4,000.
2. Prepare trial balance from the above transactions in Q.No. 1.
3. How you will create a company in Tally ? Write all steps.

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NALANDA OPEN UNIVERSITY
Master of Computer Application (MCA), Part-III
PAPER–XVII (New) - Practical
(Accounting and Financial Management)

SET-B

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 20**

Answer any Two Questions. All questions carry equal marks.

1. Give Journal Entries from the following transaction :—
   (i) Ram introduced a capital of Rs. 3,00,000.
   (ii) Purchased a goods of Rs. 39,000 from Das & Co.
   (iii) Sold goods to Rahim Rs. 1,35,000.
   (iv) Sold goods for Cash Rs. 55,000.
   (v) Salary paid Rs. 6,000.
   (vi) Purchased a Machinery Rs. 75,000.
   (vii) Rent payable Rs. 3,000.
2. Prepare Balance Sheet from the above transactions in Q.No. 1.
3. How you will create ledger under a company in Tally ? Write all steps.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-III

PAPER–XXIII (New) - Practical

(Application Development with .Net Framework)

SET-A

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 20**

Answer all the Questions. All questions carry equal marks.

1. Write a programme in VB.Net to enter any number and check whether it is palindrome or not using console programming.
2. Design a page in ASP.Net for creating your own resume.

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NALANDA OPEN UNIVERSITY

Master of Computer Application (MCA), Part-III

PAPER–XXIII (New) - Practical

(Application Development with .Net Framework)

SET-B

Annual Examination, 2022

Time : 3 Hours. **Full Marks : 20**

Answer all the Questions. All questions carry equal marks.

1. Design a form in VB.Net for check box like bold, italic and underline. After clicking on the check box display the effect in a label.
2. Design a board in ASP.Net using proper tools to display information of your choice.

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