उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 101**	कोर्स शीर्षकः– (Course Title) **Discrete Mathematics**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Let P (x) be the statement "x can speak Russian" and let Q(x) be the statement "x knows the computer language C++." Express each of these sentences in terms of P (x), Q(x), quantifiers, and logical connectives. The domain for quantifiers consists of all students at your school.
   a) There is a student at your school who can speak Russian and who knows C++.
   b) There is a student at your school who can speak Russian but who doesn"t know C++.
   c) Every student at your school either can speak Russian or knows C++.
   d) No student at your school can speak Russian or knows C++.

2. Construct truth tables for
   (i)   [(P => Q) /\ (Q => R)] => (P => R)
   (ii)   ~ (P => Q) V [(~P) /\ Q] V Q.

3. A bag contains 10 red marbles, 10 white marbles, and 10 blue marbles. What is the minimum no. of marbles you have to choose randomly from the bag to ensure that we get 4 marbles of same color?

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. Let R and S be two relations on a set A. Then if R and S are reflexive then prove that R∩S is reflexive.

5. Find using Karnaugh maps a minimal form for the boolean function.
   $f (x, y, z) = xyz + xyz' + x'yz' + x'y'z'$.

6. P and Q are consider to apply for a job. The probability that P applies for the job is 1/4, the probability that applies for the job given that Q applies for the job is 1/2 and the

probability that Q applies for the job given that P applies for the job is 1/3. Then what is the probability that P does not apply for the job given that Q does not apply for the job?

7. Five balls are drawn from a bag containing 6 white and 4 black balls. What is the probability that 3 are white and 2 black ?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science कार्यक्रम अधिन्यास सत्र 2021—2022

कोर्स कोड : Course Code: **MCS 102**	कोर्स शीर्षकः— (Course Title) **C++ and Object oriented programming**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ अधिकतम अंक : 18
Section-A **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Declare an abstract class *"Shape"* with methods 'area' & 'volume'. Refine this super class to subclasses like *"cone"*, *"cylinder"* & *"Rectangular Box.* Then, Calculate area and volume for the subclasses.

2. Explain why do we need to use constructors? Explain a copy constructor with an example.

3. What is polymorphism? Explain implementation of polymorphism with the help of a C++ program.

खण्ड ब अधिकतम अंक : 12
Section –B **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What do you mean by "this" function? What are the applications of "this" pointer?
5. List the features of Object oriented programming.
6. What is reusability? Which things can be reused?
7. What is friend function? How it is implemented in C++ ?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 103**	कोर्स शीर्षकः– (Course Title) **Data Structures**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Sort the following list of numbers using Quick Sort in descending order:
   1, 3, 2, 5, 4, 6, 12, 10, Show all the passes.

2. What is data structure? Explain different types of data structures with their applications.

3. Define tree with the help of example. How tree can be represented in memory by using Linked representation. Give example.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. Write any five advantages of Pointers over Arrays.
5. Explain different types of Graphs. How can graphs be represented using Adjacency Matrix?
6. Write a program in C language to generate the given series upto terms less than 200.
   1 - 4 + 9 - 16 + 25 ....
7. Define AVL tree. Is the statement "Every Binary Tree is an AVL tree" correct? Justify your answer.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 104**	कोर्स शीर्षकः– (Course Title) **Software Engineering**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What is prototyping? Explain the problems and advantages of prototyping in detail.

2. What are project metrics? Explain different types of project metrics with an example for each.

3. What are the different testing levels? What is the difference between the verification and validation process?

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What is Cohesion? What are the different types of Cohesion?
5. Define software risk. Explain in brief the types of software risk.
6. What are the steps involved in software project estimation?
7. Explain the features of Software Configuration Management (SCM).

Master of Computer Science कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 106**	कोर्स शीर्षकः– (Course Title) **Computer Organization**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): **Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.**

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What do you mean by Flip-Flop? Discuss the functions and circuits diagram of different type of flip flop?
2. What is the difference between combinational and sequential circuit? Explain with appropriate example.
3. Describe the role of buses in a computer system. Explain the different types of buses with suitable examples.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): **Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.**

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What is instruction cycle? When will be any interrupt processed during the instruction cycle?
5. What is Interrupt? Explain various types of Interrupts.
6. What is DMA? Explain DMA transfer modes in detail.
7. What is the difference between isolated I/O and memory mapped I/O?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science कार्यक्रम अधिन्यास सत्र **2021—2022**

कोर्स कोड : Course Code: **MCS 107**	कोर्स शीर्षकः– (Course Title) **Computer Graphics and Multimedia**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Describe the matrix formulation of 2D Translation, Scaling and Rotation.
2. Write mid-point circle drawing algorithm and apply that algorithm to find pixel value of a circle with radius r=10 and center of circle (0, 0).
3. Write short note on following
   a) Viewing coordinates.
   b) Polygon meshes
   c) 3D display methods

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. Consider two raster systems with the resolutions of 640x480, 1280x1024, and 2560x2048. What size frame buffer (in bytes) is needed for each of these systems to store 12 bits/pixel? How much storage is required for each system if 24 bits per pixel are to be stored?
5. Differentiate between parallel projection and perspective projection.
6. Explain DDA line drawing algorithm with Example.
7. What are the differences between raster scan and random scan system?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 108**	कोर्स शीर्षकः– (Course Title) **Data Communication and Computer Networks**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Explain the function of each layer of ISO ref. model for Data Communication. How it is different than TCP/IP model?
2. What is the difference between a frame and a packet? Why framing is required? Explain the significance of padding used in some of frame format?
3. What is topology? Explain basic topology with advantage and disadvantage.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What is switching? Explain the circuit switching with delay diagram.
5. What is Hamming distance and write about minimum Hamming distance?
6. List differences between flow and error control?
7. What is classful addressing? Explain different notation of IPv4 addressing?

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 109**	कोर्स शीर्षकः– (Course Title) **Database Management System**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Suppose you are given the following requirements for a simple database for the National Hockey League (NHL):
   The NHL has many teams, each team has a name, a city, a coach, a captain, and a set of players, each player belongs to only one team, each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records, a team captain is also a player, a game is played between two teams (referred to as host_team and guest_team).
   (i) Draw an E-R diagram.
   (ii) Transform the E-R diagram to a Relational Schema.

2. Consider the two sets F and G with their FDs as below :
   F: A→C, AC→D, E→AD, E→H
   G: A→CD, E→AH
   Check whether two sets are equivalent or not.

3. R(ABCDEF) F = {A→B, B→C, C→D, E→F} decomposed into D = R1(AB), R2(BCD), R3(DEF). Find whether D is Lossless or Lossy?

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What do you mean by data redundancy? Explain how DBMS handle the data redundancy.
5. What is data independence? How does DBMS achieves this property?
6. What is a transaction? What are the properties of a transaction.
7. Discuss the advantages of DBMS over traditional file processing system.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021—2022

कोर्स कोड : Course Code: **MCS 111**	कोर्स शीर्षकः— (Course Title) **Design and Analysis of Algorithm**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
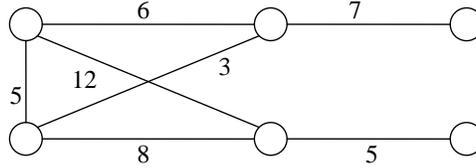**Section-A**   **Maximum Marks: 18**

नोट—(Instructions): **Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.**

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Explain the divide and conquer strategy to solve a problem? What are the various applications of divide and conquer strategy.
2. Find the minimum spanning tree using Prims algorithm for the following graph.

3. Explain greedy algorithms with suitable example. How is dynamic programming different from greedy algorithms?

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट—(Instructions): **Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.**

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What do you understand by minimum spanning tree? Explain how minimum cost spanning tree is computed?
5. Suppose we are comparing implementations of insertion sort and merge sort on the same machine. For inputs of size n, insertion sort runs in 8n2 steps, while merge sort runs in 64 n lg n steps. For which values of n does insertion sort beat merge sort?
6. Discuss the differences between stable and in-place sorting techniques.
7. Compare and contrast quick sort and merge sort?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 112**	कोर्स शीर्षकः– (Course Title) **Java Programming**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What is a constructor? Write a Java program to explain how super class constructors are called in their subclasses.
2. What is Object Oriented Paradigm? Explain why Object Oriented Programming is preferred over structured programming?
3. What is inheritance? Explain two benefits of inheritance, with an example of each.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What is static method? Explain why main method in Java is always static
5. What is package in Java? Explain how to decide the need of package(s) in a system.
6. What is the difference between Overloading and Overriding? Is it possible to override a inner classes.
7. What is multithreaded programming? Explain how threads are created in Java.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 113**	कोर्स शीर्षकः– (Course Title) **Theory of Computation**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Distinguish NFA and DFA with suitable examples.
2. Let G be the grammar
   S -> aB|bA
   A -> a|aS|bAA
   B-> b|bS|aBB
   For the string baaabbabba. Find leftmost derivation, rightmost derivation and parse tree.
3. Convert the following grammar into CNF
   S -> aBa|abba
   A -> ab | AA
   B -> aB| a

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What are the difference between decidable and undecidable problems?
5. Construct a DFA for the language 'all strings with 011 as a substring', over alphabet {0, 1}.
6. Obtain CFG for the language L = {wwR | w ϵ {a, b}* }, wR is the reversal of w }.
7. What is Push Down Automata? Give an example of a language accepted by a PDA but not by DPDA.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021—2022

कोर्स कोड : Course Code: **MCS 114**	कोर्स शीर्षकः– (Course Title) **Multimedia Technology**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): **Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.**

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. List the hardware and software components essential for professional multimedia development. Also, justify purpose and need of each of the hardware components.
2. How image is stored in vector format? Explain its advantages.
3. What are the authoring tools? List out some silent features of a good authoring tool.

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): **Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.**

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What are the differences between the GIF and JPEG?
5. What do you mean by Animation? List the all Animation Tools.
6. What are the various component of hypertext? Discuss the application of hypertext in multimedia.
7. Explain the process involved in planning of Multimedia Application.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 116**	कोर्स शीर्षकः– (Course Title) **Operating System**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18

Section-A   **Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Why there is need of process synchronization? Explain how semaphores can be used to deal with n-process critical section problem.

2. Consider the following page reference string: 1,2,3,4,2,1,5,6,1,2,3,7,6,3,2,1,2,3,6 How many page faults would occur for the LRU, FIFO, LFU and optimal page replacement algorithms assuming three and five frames?

3. Consider the following table of arrival time and burst time for three processes P0, P1 and P2.

Process	Arrival time	Burst Time
P0	0 ms	9 ms
P1	1 ms	4 ms
P2	2 ms	9 ms

   The pre-emptive shortest job first scheduling algorithm is used. Scheduling is carried out only at arrival or completion of processes. What is the average waiting time for the three processes?

खण्ड ब   अधिकतम अंक : 12

Section –B   **Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. How does thrashing occurs? Explain with an example.
5. What is a TLB? How does it improve effective access time of data?

6. What are the minimum requirements that should be satisfied by a solution to critical section problem?
7. What are the schemes used in operating system to handle deadlocks?

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र **2021—2022**

कोर्स कोड : Course Code: **MCS 117**	कोर्स शीर्षकः– (Course Title) **Soft Computing**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट—(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Illustrate the various steps involved in the back propagation algorithm with a suitable diagram.

2. Explain the different types of crossover operations and survivor selection methods used in genetic algorithm.

3. Explain the fuzzy rule based system with help of a block diagram? Illustrate various types of defuzzification techniques.

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट—(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. Distinguish between hard and soft computing.
5. Apply the binary and bipolar sigmoid function for the below figure and find its output.
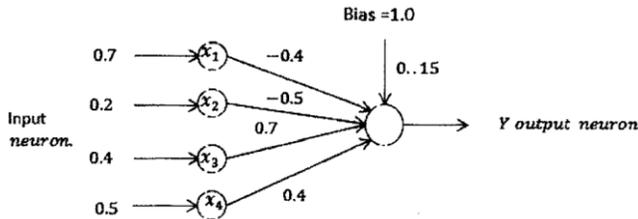
6. What is deep leaning? What are the applications of a Convolutional Neural Network (CNN)?
7. Discuss how recurrent neural network is different from convolutional neural network.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science   कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 119**	कोर्स शीर्षकः– (Course Title) **Information and Network Security**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ   अधिकतम अंक : 18
Section-A   **Maximum Marks: 18**

नोट–(Instructions): **Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.**

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. Generate public key and private key in case of RSA algorithm if two prime numbers are 5 and 7 and p=5, q=7.

2. Explain different types of attacks. Discuss various security approaches.

3. Explain the following

   (a) Replay attack (b) Denial of service attack (c) authentication (d) integrity (e) confidentiality (f) nonrepudiation

खण्ड ब   अधिकतम अंक : 12
Section –B   **Maximum Mark : 12**

नोट–(Instructions): **Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.**

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What is digital certification? How it can be achieved?
5. Describe DES symmetric key cryptography algorithm.
6. What is the need of firewall? Explain virtual private network.
7. What is a virus? Explain various types of viruses.

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,इलाहाबाद

Master of Computer Science　　　　　कार्यक्रम अधिन्यास सत्र 2021–2022

कोर्स कोड : Course Code: **MCS 120**	कोर्स शीर्षकः– (Course Title) **System Software**	अधिकतम अंक : 30 **Maximum Marks : 30**

खण्ड अ　　　　　　　　　　　　　　　　　　अधिकतम अंक : 18
Section-A　　　　　　　　　　　　　　　　**Maximum Marks: 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words. Attempt <u>all three questions</u> from this section.

प्रश्न संख्या 1 से 3 तक दीर्घ उत्तरीय प्रश्न है जिनका उत्तर 800 से 1000 शब्दों में लिखना है।

1. What are the differences between Search Data Structures and Allocation Data Structures in Language Processors?

2. What is a general purpose macro processor? State and explain the algorithm for an one pass macro processor.

3. What is the role of parser in compiler design? Differentiate between top-down parsing and bottom-up parsing.

खण्ड ब　　　　　　　　　　　　　　　　　　अधिकतम अंक : 12
Section –B　　　　　　　　　　　　　　　**Maximum Mark : 12**

नोट–(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. Attempt <u>all four questions</u> from this section.

प्रश्न संख्या 4 से 7 तक लघु उत्तरीय प्रश्न है जिनका उत्तर 200 से 300 शब्दों में लिखना है।

4. What do you understand by Machine Dependency of System Software?

5. What is a loader? How loader is different from linker?

6. What is the regular expressions that denotes a language comprising all possible strings of even length over the alphabet (0 , 1)?

7. What are different code optimization techniques?