उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय, प्रयागराज

Master of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: **MCA-101/PGDCA-101**	कोर्स शीर्षकः– (Course Title) **Computer Fundamental & Its 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.

1. Explain different types of Memories.
2. With the help of a diagram explain the components of a computer system.
3. Explain the difference between flow chart and pseudo-code with the help of an 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.

4. What is a light pen? Briefly explain its working.
5. Differentiate between seek time and latency.
6. What is Data Transfer rate? Explain.
7. Explain signed 1's complement representation of integers with the help of an example.

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कोर्स कोड : Course Code: **MCA-102/PGDCA-102**	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.

1. Answer the following:
   a. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?
   b. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?
2. Rewrite the following arguments using qualifiers, variables and predicate symbols:
   a. All birds can fly
   b. Some men are genius.
   c. Some numbers are not rational
   d. There is a student who likes mathematics but not geography.
3. Explain the following terms with suitable examples –
   a. Conjuction
   b. Disjunction
   c. Contrapositive

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.

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

5. In any boolean algebra show that
   (a + b) (b + c) (c + a) = ab + bc + ca.
6. Define with examples of NAND and NOR gates.
7. Briefly explain the Pigeonhole principle.

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कोर्सकोड : Course Code: **MCA-103/PGDCA-103**	कोर्स शीर्षकः– (Course Title) **C Programming**	अधिकतमअंक : 30 **Maximum Marks : 30**

खण्ड अ **अधिकतमअंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.

1. Discuss about arithmetic operators and relational operators.
2. Differentiate between break and continue statements in C language with example.
3. What is a structure? Create a suitable structure for storing the information about the Technical Institutions in India (Assume appropriate attributes to store the information). List all the institutes for a given state.

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.

4. Write any five advantages of Pointers over Arrays.
5. What is the difference between call by value and call by reference parameter passing techniques.
6. Write a function int power (int x, int n) to return x^n
7. What do you mean by storage classes in C language. Writ the difference between static and automatic storage class.

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कोर्स कोड : Course Code: **MCA-104/PGDCA-104**	कोर्स शीर्षकः– (Course Title) **Numerical Analysis**	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.

1. What does iteration mean and how iterative methods converge after every step.
2. Find the real root of the equation $f(x) = x^3 - 2x - 5 = 0$ by the method of false position up to three places of decimal.
3. Apply Gauss elimination method to solve the equations

$$2x + 4y + 6z = 22, \quad 3x + 8y + 5z = 27, \qquad -x + y + 2z = 2 .$$

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.

4. Solve by Jacobi's iteration method, the equations

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

5. Find (a) Δe^{ax} (b) $\Delta^2 e^x$
6. For the table below, Evaluate f(9) using Lagrange's Interpolation formula:

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

7. Find the following table, find the values of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 2.03$

x	1.96	1.98	2.00	2.02	2.04
y	0.7825	0.7739	0.7651	0.7563	0.7473

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कोर्स कोड : Course Code: **MCA-105/PGDCA-105**	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.

1. (a)Implement the following Boolen Expression with NOR GATE only.
   F (A, B, C) = Π(0, 2, 4, 6, 7)
   (b) Why NAND and NOR gates are called as Universal gate.
2. What do you mean by Flip-Flop? Discuss the functions and circuits diagram of different type of flip flop?
3. What is the difference between combinational and sequential circuit? Explain with appropriate 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.

4. Differentiate Hardware and Micro-programmed control unit with their advantages and disadvantages.
5. What is instruction cycle? When will be any interrupt processed during the instruction cycle?
6. What is DMA? Explain DMA transfer modes in detail.
7. What do you mean by memory hierarchy? Why registers are present in CPU?

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कोर्सकोड : Course Code: **MCA-107/ PGDCA-107**	कोर्स शीर्षकः– (Course Title) **Data Structures**	अधिकतमअंक : 30 **Maximum Marks : 30**

खण्ड अ **अधिकतमअंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.

1. What is a stack? What operations are associated with a stack?
2. Sort the following list of numbers using Quick Sort in descending order:
   1, 3, 2, 5, 4, 6, 12, 10, Show all the passes.
3. Discuss the applications of searching techniques. Write a program in C to implement a linear search and binary search.

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.

4. Define “Binary Tree”. How does a Binary Tree differ from a Tree?
5. Define “Graph”. When can it be said that two vertices of a Graph are connected?
6. Write an algorithm for the addition of two matrices.
7. Define AVL tree. Is the statement “Every Binary Tree is an AVL tree” correct? Justify your answer.

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कोर्सकोड : Course Code: **MCA-108/ PGDCA-108**	कोर्स शीर्षकः– (Course Title) **Organizational Behavior**	अधिकतमअंक : 30 **Maximum Marks : 30**

खण्ड अ **अधिकतमअंक : 18**

Section-A **Maximum Marks : 18**

नोट–(Instructions): Section A consists of long answer questions. Answer should be in 800 to 1000 words.

1. Explain various internal & external determinants of consumer behavior?
2. What do you understand by the concept of consumer behavior? Also discuss it application in advertising decisions
3. Explain important models of buying behavior? Which one is most relevant in current liberalized marketing scenario.

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.

4. Why consumer behavior is important in selling decisions?

5. Differentiate between consumer attitude and perception?

6. How you will analyze influences of children in family buying?

7. What is “Haward Sheth Model” of decision making?

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कोर्स कोड : Course Code: **MCA-109/ PGDCA-109**	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.

1. Define the following:
   (i) Software Product
   (ii) Software Engineering
   (iii) Software Testing.
2. (a) Define software risk. Explain in brief the types of software risk.
   (b) Explain the layered approach used in software Engineering.
3. Explain SDIC in detail. Also explain the framework activities involved in the software development 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.

4. Explain four differences between alpha & Beta testing.
5. Explain the task in value at in Requirements Engineering.
6. Define software reliability and software availability.
7. Explain four approaches to handle the software sizing problem.

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कोर्स कोड : Course Code: **MCA-110/ PGDCA-110**	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.

1. What is operator overloading? Illustrate Operator overloading concept to concatenate strings.
2. Explain why do we need to use constructors? Explain a copy constructor with an example.
3. What are the different forms of inheritance supported by C++ ? Explain with 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.

4. What do you mean by “this” function? What are the applications of “this” pointer?
5. What are pure virtual functions?
6. What is friend function? How it is implemented in C++ ?
7. What are different types of inheritance?

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कोर्स कोड : Course Code: **MCA-111/ PGDCA-111**	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.

1. What is data communication? Discuss the different made of Data communication. 6
2. What do you mean by addressing? Discuss the different type of addressing.
3. Give the ISO-OSI ref. model for Data Communication and explain the function of each layer in brief. How it is different than TCP/IP model?

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.

4. How BGP is different from other distance vector routing protocols?
5. What do you mean by digital signature?
6. What do you mean by Baud rate? How is it different from Bit rate?
7. What is Analog data transmission?