

उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय, प्रयागराज

Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-101	कोर्स शीर्षक:— (Course Title) Computer Fundamental & PC Software	अधिकतम अंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतम अंक : 18

Maximum Marks : 18

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

1. Explain the different classification of Computers? Differentiate between micro computers mini-computers and main-frames.
2. What are the different categories of languages? Explain various elements of a programming language.
3. Explain the differences between followings:
 - (i) Message switching and Circuit switching.
 - (ii) Router and Gateway
 - (iii) Ring Topology and Star Topology.

खण्ड ब

Section –B

अधिकतम अंक : 12

Maximum Mark : 12

नोट— (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

4. Explain the terms: Serial Processing, Batch Processing and Multiprogramming
5. Differentiate between Star, Bus and Ring topology.
6. What is Computer virus? Briefly explain different types of computer virus?
7. How you have to insert header and footer in presentation? Explain how graph is created in MS-word.

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Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्सकोड : Course Code: BCA-102	कोर्स शीर्षक:— (Course Title) C Programming	अधिकतमअंक : 30 Maximum Marks : 30
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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. All questions are compulsory.

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. All questions are compulsory.

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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कोर्सकोड : Course Code: BCA-103	कोर्स शीर्षक:— (Course Title) Data Structures	अधिकतमअंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतमअंक : 18

Maximum Marks : 18

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

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

Section –B

अधिकतम अंक : 12

Maximum Mark : 12

नोट—(Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

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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Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-104	कोर्स शीर्षक:— (Course Title) Basic Mathematics	अधिकतम अंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतम अंक : 18

Maximum Marks : 18

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

1. State and prove-
 - a) Lagrange's mean value theorem
 - b) Roll theorem
2. a) Prove that $\cap (B \cup C) = (A \cap B) \cup (A \cap C)$, where A, B, C are non-empty sets.
b) Find the Value of x: $(x^2 + 2x + 3)^{1/2} = (2x + 5)$
3. Evaluate
 - a) Evaluate $\lim_{x \rightarrow 0} \sqrt[3]{1 + x} - 1$
 - b) $\lim_{x \rightarrow 0} \tan(x)^{1/x^2}$

खण्ड ब

Section -B

अधिकतम अंक : 12

Maximum Mark : 12

नोट— (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

4. Find the area bounded by the curve $y=\sqrt{x}$ and $y=x$.
5. If α and β are roots of $ax^2 + bx + c = 0$ then find $\alpha^3 + \beta^3$.
6. Integrate $\int \frac{dx}{1+\sin x}$
7. Explain with example, monotonic functions.

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Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-106	कोर्स शीर्षक:- (Course Title) Numerical Analysis	अधिकतम अंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतम अंक : 18

Maximum Marks : 18

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

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

खण्ड ब

Section -B

अधिकतम अंक : 12

Maximum Mark : 12

नोट- (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

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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Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-107	कोर्स शीर्षक:— (Course Title) Multimedia Technology	अधिकतम अंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतम अंक : 18

Maximum Marks : 18

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

1. List the hardware and software components essential for professional multimedia development. Also, justify purpose and need of each of the hardware components.
2. What is the method of storing image in vector format? Explain its advantages.
3. Describe in detail any five multimedia input devices and output devices.

खण्ड ब

Section –B

अधिकतम अंक : 12

Maximum Mark : 12

नोट— (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

4. What do you mean by Sampling?
5. What are the differences between the GIF and JPEG?
6. What do you mean by Animation? List the all Animation Tools.
7. Define the term parallel projection. Categorize various types of parallel projection.

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Bachelor of Computer Application कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-108	कोर्स शीर्षक:— (Course Title) Discrete Mathematics	अधिकतम अंक : 30 Maximum Marks : 30
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खण्ड अ

Section-A

अधिकतम अंक : 18

Maximum Marks : 18

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

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. Conjunction
 - b. Disjunction
 - c. Contrapositive

खण्ड ब

Section –B

अधिकतम अंक : 12

Maximum Mark : 12

नोट— (Instructions): Section B consists of short answer questions. Answer should be in 200 to 300 words. All questions are compulsory.

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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Bachelor of Computer Application (BCA)

कार्यक्रम अधिन्यास सत्र 2020-21

कोर्स कोड : Course Code: BCA-109	कोर्स शीर्षक:- (Course Title) C++ and Object Oriented Programming	अधिकतम अंक : 30 Maximum Marks : 30
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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. All questions are compulsory.

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. All questions are compulsory.

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?