उत्तर प्रदेश राजर्षि टण्डन मुक्त विश्वविद्यालय,प्रयागराज

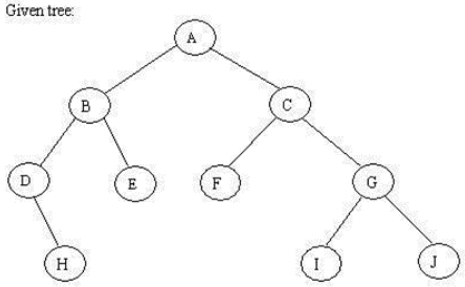
ASSIGNMENT QUESTION PAPER

Session: **2025 -26**	Max. Marks: **30**
Program Name:	**Bachelor of Computer Application (BCA)**
Course Code: **BCA-1.1**	Course Name: **C Programming**

SECTION -A		**2*6=12 marks**
Q. No.	**Short answer type question (approx. 200 -300 words)**	**Marks**
1.	Write a program in C language to generate the given series upto terms less than 200. 1 - 4 + 9 - 16 + 25	**2**
2.	Design an algorithm and the corresponding flowchart for finding the sum of the numbers 2, 4, 6, 8, ..., n	**2**
3.	Write a C Program for reversing the digits of an integer. Also check whether it is palindrome or not?	**2**
4.	What is a library function? What are its uses in C programming?	**2**
5.	Write a program tocount number of words, characters, blanks, punctuation marks in a file.	**2**
6.	Define a suitable data structure to store the information like student name, roll number, enrolment centre and marks of five different subjects. Write a 'C' function to insert sufficient data in your data structure and function to print the name of the student and the total obtained marks who have secured highest total marks for each and every enrolment centre.	**2**
SECTION -B		**6*3=18 marks**
Q. No.	**Long answer type question (approx. 500 -800 words)**	**Marks**

7.	What is an operator? Explain the arithmetic, relational, logical and assignment operators in C language with appropriate example.	**6**
8.	(a) Write a C program to imp1ement linear linked list, showing all the operations that can be performed on a linked list. (b) Write a C program to check whether the given matrix is symmetric or not	**6**
9.	(a) Discuss the applications of searching techniques. Write a C program to implement a binary search. (b) What are control statements? Explain different loop control statements with examples.	**6**

Session: **2025 -26**	Max. Marks: **30**
Program Name:	**Bachelor of Computer Application (BCA)**
Course Code: **BCA-1.2**	Course Name: **Data Structures**

	SECTION -A	**2*6=12 marks**
Q. No.	**Short answer type question (approx. 200 -300 words)**	**Marks**
1.	Explain advantages of pointers over arrays.	**2**
2.	Define "Graph". When can it be said that two vertices of a Graph are connected?	**2**
3.	Write a function to return sum of first N natural number.	**2**
4.	Write in-order, pre-order and post-order traversal of following binary tree. Given tree: 	**2**
5.	Sort the sequence 33, 11, 64, 58, 94, 62, 76, 15 using quick sort.	**2**
6.	Write a program for evaluating ${}^{n}C_{r}$ for the given value of n and r using recursive procedure.	**2**
	SECTION -B	**6*3=18 marks**
Q. No.	**Long answer type question (approx. 500 -800 words)**	**Marks**
7.	(a) Differentiate between stack and queue with appropriate example. (b) Explain linked list with suitable example. What are the differences between a singly linked list and a doubly linked list?	**6**

8.	Describe the minimum spanning tree with an example? Explain the applications of Breadth First Search and Depth First search?	**6**
9.	(a) What are the various applications of searching techniques? How is binary search different from sequential search? b) Describe various types of sorting techniques. Explain the advantages of Quick sort over Bubble sort.	**6**

Session: **2025 -26**	Max. Marks: **30**
Program Name:	**Bachelor of Computer Application (BCA)**
Course Code: **BCA-1.3**	Course Name: **Basic Mathematics**

SECTION -A		**2*6=12 marks**
Q. No.	**Short answer type question (approx. 200 -300 words)**	**Marks**
1.	Evaluate $\int (x+1)e^x(xe^x+5)^4\,dx$	**2**
2.	Evaluate $lim_{x\to 0}\sqrt{(1+x)}-1$	**2**
3.	Find $\frac{dy}{dx}, if y = x^{x^x}$	**2**
4.	Trace the curve y = x3 – 8x2 + x + 42.	**2**
5.	Find the angle between the lines 2x+3y=7 and 4x+5y=14.	**2**
6.	Find the cartesian forms of the equations (a) $r^2 = 3r \sin\theta$. (b) r = a(1-cos θ), where a is a constant.	**2**
SECTION -B		**6*3=18 marks**
Q. No.	**Long answer type question (approx. 500 -800 words)**	**Marks**
7.	State and prove Lagrange's mean value theorem	**6**
8.	a) Integrate $\int cos(x)^5 sin(x)^7\,dx$ b) Show that Every differentiable function is continuous but converse is not true.	**6**
9.	a) Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cup C)$. where A, B, C are non-empty sets. b) Find the Value of x: $(x^2 + 2x + 3)^{1/2} = (2x + 5)$	**6**

Session: **2025 -26**	Max. Marks: **30**
Program Name:	**Bachelor of Computer Application (BCA)**
Course Code: **BCA-1.4**	Course Name: **Numerical Analysis**

SECTION -A		**2*6=12 marks**
Q. No.	**Short answer type question (approx. 200 -300 words)**	**Marks**
1.	If $\pi = 22/7$ is approximated as 3.14, find the absolute error and relative error respectively.	**2**
2.	Find a root of $3x^3 - x^2 + 3x - 1 = 0$ near $x_0 = 0.2$ in two iterations by Birge-Vieta method.	**2**
3.	Solve Sin x = x/2 by Newton-Raphson method.	**2**
4.	Find the inverse of the matrix $A = \begin{vmatrix} 5 & -2 & 4 \\ -2 & 1 & 1 \\ 4 & 1 & 0 \end{vmatrix}$	**2**
5.	Apply Gauss- Jordon Reduction to solve the equations: $2x - 3y + z = -1$, $x + 4y + 5z = 25$, $3x - 4y + z = 2$	**2**
6.	Solve the following equation by Gauss-Seidel method: $27x + 6y - z = 85$ $x + y + 54z = 110$ $6x + 15y + 2z = 72$	**2**
SECTION -B		**6*3=18 marks**
Q. No.	**Long answer type question (approx. 500 -800 words)**	**Marks**
7.	Apply Gauss elimination method to solve the equations: $2x + 2y + z = 12$, $3x + 2y + 2z = 8$,	**6**

	$5x + 10y - 8z = 10$	
8.	What do you mean by Simpson's 1/3 rd and 3/8 th rule. Find the value of $\int 1/\sqrt{(1-x^2)}\, dx$ by Simpson"s 1/3 rd rule.	**6**
9.	Use the Jacobi method to approximate the solution of the following system of linear equations. $5x1 - 2x2 + 3x3 = 1$ $-3x1 + 9x2 + x3 = 2$ $2x1 - x2 - 7x3 = 3$ Continue the iterations until two successive approximations are identical when rounded to three significant digits.	**6**