CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – II Session- JUN-JULY, 2024 Month- July

Sem- CSE 2nd (AI)/DS) Subject- Code-A000271(014)

Subject Name – Engineering Mathematics - II

Time Allowed:2 hrs

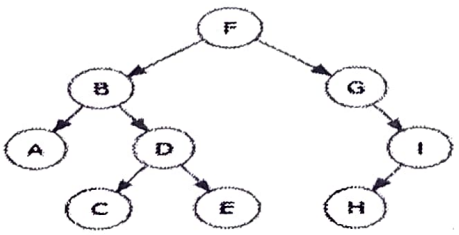
Note: -
1:Question (1) of unit I and II is compulsory.
2: Attempt any two question of Question (2),(3) and (4) of unit I and II.

Q.N.	Questions	Marks
	Unit I	
Q1	Solve: $y^2p - xyq = x(z - 2y)$	[4]
Q2	Solve: $(i)\ (D^2 + DD' + D' - 1)z = \sin(x + 2y).$ $(ii)\ (D^3 - 4D^2D' + 5DD'^2 - 2D'^3)z = e^{y-2x} + e^{y+2x} + e^{y+x}.$	[8]
Q3	Reduce the differential equation $r + 2s + t = 0$ to its canonical form and hence solve it.	[8]
Q4	Solve the boundary valued problem by using the mehod of separation of variaables: $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$; given that $u(0, y) = 8e^{-3y}$	[8]
	Unit II	
Q1	Prove that $\int_0^\infty \frac{e^{-t}\sin^2 t}{t}\, dt = \frac{1}{4} log5$	[4]
Q2	Using laplace transformation find the solution of the differential equation $\frac{d^2y}{dt^2} - \frac{dy}{dt} - 6y = 2$, satisfying the given coditions $y(0) = 1, y'(0) = 0$	[8]
Q3	Find : $L^{-1}\left\{\frac{(5P+3)}{(P-1)(P^2+2P+5)}\right\}$ and $L^{-1}\left\{\frac{(P^2+2P-4)}{(P^2+2P+2)(P^2+2P+5)}\right\}$.	[8]
Q4	Test for consistancy of the following system of equations: $2x + 3y + 5z = 1,\ 3x + y - z = 2,\ x + 4y - 6z = 1.$ If consistant, solve the above system of equations.	[8]

Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2 (*Jan-June 2024*)
B. Tech (H)-2nd Semester
Branch: Artificial Intelligence/ Data Science

Subject Name: Data Structure Using C **Subject Code: A000272(022)**
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: All questions are compulsory

CO3: Understand the concepts of Linked list
CO4: Understand and implement trees and graphs
CO5: Understand the concepts of representation and application of tree and graph

Q. No.		Questions	Marks	BL	CO
		UNIT 3			
1	a	Write a C program to create a linked list of 5 nodes using dynamic memory allocation method	8	L4	3
		UNIT 4			
2	a	Define polish notation. (i) Convert the following infix expression to postfix expression using stack. ((A+B)/D)^((E-F)*G) (ii) Convert the following infix expression to prefix expression using stack. K + L - M * N + (O^P) * W/U/V * T + Q	8	L4	4
	b	Write an algorithm to insert an element in to a stack using dynamic method	8	L4	4
		UNIT 5			
3	a	Create a Binary Tree from the given Inorder and Preorder Sequence. Inorder : DBOHPEJAKFLCMGN Preorder: ABDEHOPJCFKLGMN	8	L3	5
	b	 Find out the inorder, preorder and postorder traversal of the above binary tree	8	L3	5

Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2
B. Tech (Hons.)-2nd Semester
Branch: AI/DS

Subject Name: Object Oriented Programming **Subject Code**: **A000273(022)**

Max Marks: 40 **Min Marks:14** **Times: 2 hrs.**

Note: All questions are compulsory

Q. No.		Questions	Marks
1	a	Define the following: a) Operator overloading b) Derived class and base class	5
	b	What is inheritance in C++. Define types of inheritance with their definitions and syntax.	5
	c	What are modes of inheritance available in C++. **OR** Write a C++ program to overload binary operator.	5
	d	Write a program which demonstrate pointer to object. The class member call through pointer object.	5
2	a	What are virtual functions. Write a program that uses virtual function.	5
	b	Define Friend class and friend function in brief with program	5
	c	Define stream class. And explain in brief the hierarchy of iostream class.	5
	d	Write a C++ program for open() and close() function. What are stream errors in C++	5

Chhattisgarh Swami Vivekanand Technical University

University Teaching Department

Class Test-II

B. Tech(H)-2nd Semester

Branch: AI/DS

Subject Name: Digital Logic Design D **Subject Code:** A000274 (028)

Max Marks: 40 **Times: 2 hrs**

Note: Part A is compulsory, attempt any two questions from B, C, and D.

Q. No.		Questions	Marks
1	A-	Write short note on Noise Margin and Propagation delay in digital circuit.	4
	B	Derive the characteristic equation of a JK flip-flop and explain its behavior with all possible input combinations. Provide a truth table to illustrate your explanation.	8
	C	Explain the working principle of a 4-bit serial-in serial-out (SISO) and parallel-in parallel-out (PIPO) shift register.	8
	D	Explain the basic operating principles of Transistor-Transistor Logic (TTL) and Emitter-Coupled Logic (ECL).	8
2	A	Define data flow, Behavioral and structural modeling style in Verilog.	4
	B	Write a Verilog code for a 4-to-1 multiplexer.	8
	C	Explain the difference between Moore and Mealy machines.	8
	D	Design a verilog module for full adder circuit along with the test bench.	8

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – II Session- JAN– JUN, Month-July

Sem- CSE 2nd(DS/AI)

Subject Name – Python for Data Science

Subject-Code- A0002935(022)

Max. Marks:40 Min. Marks:14 Time Allowed:2 hrs

Note:-Part A and B are compulsory, attempt any one questions from C and D.

CO1: Translate fundamental programming concepts such as data types, loops, conditionals into Python code.

CO2: Know when and how to implementsUser define modules, Exception Handling, file operation OOPS Concepts (e.g., into functions, or classes) to make it more modular and robust.

CO3: Use NumPy perform common data wrangling and computational tasks in Python.

CO4: Use Pandas to create and manipulate data structures like Series and DataFrames.

CO5: Wrangle different types of data in Pandas including numeric data, strings, and datetimes.

CO6: To understand the data preprocessing and data visualization using Python libraries.

	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Unit III			
Q1	Explain the following attributes of NumPy Array with suitable examples. i) Ndim ii) Shape iii) size iv) Dtype v) itemsize	[4]	Understand	CO3
Q2	**What is the difference between the NumPy functions vstack and hstack? Perform the following universal function on below NumPy array.** import numpy as np A=np.arange(6,-6,-1).reshape((3,4)) B=np.arange(6,-18,-2).reshape((3,4)) 1)Print(np.copysign(B,A)) 2)print(np.sign(A)) 3)print(np.rint(A)) 4)print(np.isnan(B)) 5) print(np.square(B))	[5]	Apply	CO3
Q3	Explain the astype() in numpy with an examples. Find out the output of B and C on following three dimensional numpy array. import numpy as np A=np.arange(24).reshape(2, 3, 4). B=np.swapaxes(A, 0, 2) C=np.swapaxes(A, 0, 1)	[5]	Analyzing	CO3

Q4	Differentiate between NumPy Array and Array. What will be the output of following 3D numpy array on slicing operations? D=array ([[[1,2,3,4], [5,6,7,8], [9,10,11,12]] [[13,14,15,16], [17,18,19,20], [21,22,23,24]]]) a) D[:, :, :1] b) D[:, 1:, ::2] c) D[:, 1:, ::1] d) D[:, :1, :1] e) D[:1, :1, :1]	[5]	Understand	CO3
	Unit IV			
Q1	Explain the **groupby** method in pandas dataframe.	[3]	Create	CO4
Q2	Discuss the following methods associated with the Dataframe with suitable examples. a) head(9) b) drop() c) insert() d) rename() e) sort_values()	[5]	Analyzing	CO4
Q3	Explain the use of advanced pandas functions such as **apply(), map()** and **applymap()** operations with an suitable examples..	[5]	Analyzing	CO4
Q4	Explain the following Ranking method with suitable examples. a) first b) dense c) groupby d) max e) min	[5]	Understand	CO4
	Unit V			
Q1	Explain the difference between the **loc** and **iloc** indexes in pandas.	[3]	Create	CO5
Q2	How do you handle **missing values** in a pandas dataframe. Explain with suitable examples.	[5]	Analyzing	CO5
Q3	Differentiate between **category** and **object** data types of Pandas dataframe. Discuss the following methods associated with the Dataframe with suitable examples. a) unique b) columns() c) size() d) shape() e) ndim()	[5]	Analyzing	CO5
Q4	Explain **isnull()** function of pandas dataframe. What is the main difference between the **Bar plot** and **Histogram plot**.	[5]	Understand	CO6