Shri Shankaracharya Institute of Professional Management & Technology
Department of Computer Science and Engineering (AI)
Class Test – II, Session- July-dec2022,Date-7/2/2023
Sem- B.Tech.3rd Sem
Subject- Introduction to Python

Time Allowed:2 hrs. **Max Marks: 40**

Note: Attemptany five questions. All question will carry equal marks.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
Q1	How are iloc() and loc() different? How does the groupby() method works in Pandas?	08	Understanding	CO3
Q2	How to load pandas Data Frame from csv file data with delimiter space explain with python code? What is the difference between join() and merge() in Pandas?	08	Applying	CO3
Q3	What is a Unicode string?Why use a Unicode string? Explain ndim, empty, tail() function of pandas Data Frame.	08	Understanding	CO3
Q4	What is Matplotlib? What is the best way to generate histograms in Matplotlib?	08	Understanding	CO4
Q5	Which of plots can be used to show the relationship between two quantitative variables?Create the x-axis as a Numpy array spanning from 0 to 2*pi. Next, create two plots to show the Sine and Cosine functions for x. Title the plot as "Sine and Cosine Functions", and also add relevant x-axis and y-axis labels.	08	Applying	CO4
Q6	What are the differences between qualitative vs. quantitative data? What are the best methods for data cleaning?	08	Understanding	CO5

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Shri Shankaracharya Institute of Professional Management & Technology
Department of Computer Science and Engineering (AI)
Class Test – II , Session- July-dec2022,Date-8/2/2022
Sem- B.Tech.3rd Sem
Subject- Operating System

Time Allowed:2 hrs. **Max Marks: 40**

Note: Solve any two questions from each part.

<table>
<tr><th>Q.N.</th><th>Questions</th><th>Marks</th><th>Levels of Bloom's taxonomy</th><th>COs</th></tr>
<tr><td colspan="5">Unit-III</td></tr>
<tr><td>Q1</td><td>What are the four necessary conditions for characterizing deadlock? What is the only reasonable condition that can be used to prevent deadlock from occurring?</td><td>10</td><td>Understanding</td><td>CO1</td></tr>
<tr><td>Q2</td><td>Consider a system that contains five processes P1, P2, P3, P4, P5 and the three resource types A, B and C. Following are the resources types: A has 10, B has 5 and the resource type C has 7 instances.
<table>
<tr><th>Process</th><th colspan="3">Allocation</th><th colspan="3">Max</th></tr>
<tr><th></th><th>A</th><th>B</th><th>C</th><th>A</th><th>B</th><th>C</th></tr>
<tr><td>P1</td><td>0</td><td>1</td><td>0</td><td>7</td><td>5</td><td>3</td></tr>
<tr><td>P2</td><td>2</td><td>0</td><td>0</td><td>3</td><td>2</td><td>2</td></tr>
<tr><td>P3</td><td>3</td><td>0</td><td>2</td><td>9</td><td>0</td><td>2</td></tr>
<tr><td>P4</td><td>2</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>P5</td><td>0</td><td>0</td><td>2</td><td>4</td><td>3</td><td>3</td></tr>
</table></td><td>10</td><td>Applying</td><td>CO2</td></tr>
<tr><td>Q3</td><td>Why is deadlock state more critical than starvation? Describe resources allocation graph with a deadlock with a cycle but no deadlock.</td><td></td><td>Understanding</td><td>CO1</td></tr>
<tr><td colspan="5">Unit-IV</td></tr>
<tr><td>Q4</td><td>What do you mean by paging and segmentation with internal and external fragmentation.</td><td>10</td><td>Understanding</td><td>CO1</td></tr>
<tr><td>Q5</td><td>A system uses 3-page frames for storing process pages in main memory. It uses the First in First out (FIFO), Shortest job first and least recently used page replacement policy. Assume that all the page frames are initially empty. What is the total number of page faults that will occur while processing the page reference string given below-
4, 7, 6, 1, 7, 6, 1, 2, 7, 2,6,8,4,9
Also calculate the hit ratio and miss ratio.</td><td>10</td><td>Applying</td><td>CO2</td></tr>
<tr><td>Q6</td><td>What do mean by virtual memory concepts. Explain in detail with figure.</td><td>10</td><td>Understanding</td><td>CO1</td></tr>
</table>

Shri Shankaracharya Institute of Professional Management & Technology

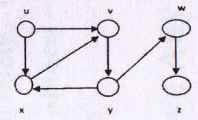
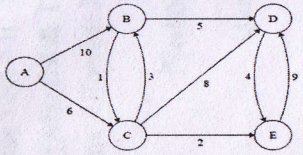
Department of CSE(AI)

Class Test – II Session- July – Dec 2022 Month-February

Sem- AI 3rd | Subject- Data Structure and Algorithm | Code- B127312(022)

Time Allowed: 2 hrs | Max Marks: 40

Note: - All Questions are compulsory.

Q. N.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Suppose the following list of letters is inserted in order into an empty binary search tree: **J,R,D,G,T,E,M,H,P,A,F,Q** a) In-order Traversal b) Post-order Traversal	[4]	Apply	CO4
2.	Write an algorithm for Queue operations using an array. Operations are: Insert an element and Delete an element.	[6]	Apply	CO3
3.	What is a Binary Search Tree? Suppose the following numbers are inserted into an empty BST **40 25 70 22 35 60 80 90 10 30.** Draw Tree T. Applying the following on the original tree T. **1. Delete 30 2. Delete 80 3. Delete 40**	[6]	Apply	CO4
4.	Write an algorithm to perform Breadth-First Search Technique. Illustrated with an example. 	[6]	Apply	CO4
5.	Using Dijkstra's shortest path algorithm finds out least cost path in a given graph. Consider **A as a Source Vertex**. 	[6]	Apply	CO4
6.	Why AVL tree is required? Create an AVL Tree from the given set of values: **64, 1, 44, 26, 13, 110, 98, 85**	[6]	Apply	CO4
7.	Write Quick Sort algorithm. Illustrated with the given set of values: **D, A, T, A, S, T, R, U, C, T, U, R, E, S**	[6]	Apply	CO5

Shri Shankaracharya Institute of Professional Management & Technology

Department of CSE(AI)

Class Test – II Session- July – Dec 2022 Month-February

Sem- AI 3rd | Subject- Data Structure and Algorithm | Code- B127312(022)

Time Allowed: 2 hrs | Max Marks: 40

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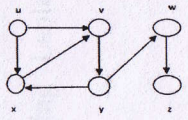
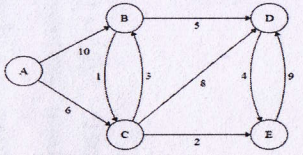
4.	Write an algorithm to perform Breadth-First Search Technique. Illustrated with an example. 	[6]	Apply	CO4
5.	Using Dijkstra's shortest path algorithm finds out the least cost path in a given graph. Consider **A as a Source Vertex.** 	[6]	Apply	CO4
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Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – II Session – July – Dec 2022 Month - January

Semester – CSE (AI), ET & IT III Subject – Mathematics III Code – B000311(014)

Time Allowed: 2 Hours Maximum Marks: 40

Note: Solve Any 5 Questions

Q. N.	Questions	Marks	Level of Bloom's Taxonomy	COs
1.	Solve the partial differential equation $px(z-2y^2)=(z-qy)(z-y^2-2x^3)$.	[8]	Applying	CO2
2.	Solve the homogeneous partial differential equation $\frac{\partial^3 z}{\partial x^3}+\frac{\partial^3 z}{\partial x^2 \partial y}-6\frac{\partial^3 z}{\partial y^3}=y\cdot Cosx$	[8]	Applying	CO2
3.	Using method of separation of variables solve $3\frac{\partial u}{\partial x}+2\frac{\partial u}{\partial y}=0$ $u(x,0)=4e^{-x}$	[8]	Applying	CO2
4.	(i) Prove that $\int_0^\infty \frac{e^{-t}\sin^2 t}{t}dt=\frac{1}{4}\log_e 5.$ (ii) Evaluate $L\left\{t\int_0^t \frac{e^t \sin t}{t}dt\right\}$.	[4+4]	Applying	CO3
5.	(i) Evaluate inverse Laplace transform of $\frac{s+2}{s^2-4s+13}$. (ii) Find the inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s^2}\right)$.	[4+4]	Applying	CO3
6.	Solve the given equation using Laplace transform $ty''+2y'+ty=\cos t,\quad y(0)=1$.	[8]	Applying	CO3

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – II Session- July-Dec, 2022 Month- February
Sem- ET&T+IT+CSE(AI) 3rd Subject- Digital System Design- B000313(028)
Time Allowed: 2 hrs Max Marks: 40

***Note:* - Attempt any 5.**

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Design MOD-8 asynchronous up counter. If the output frequency is 11 kHz what is the clock input?	[8]	Design	CO4
2.	Explain CMOS Logic. Design the followig boolean expression Y= (A+B+CD)'	[8]	Apply	CO5
3.	Convert RS F/F to JK F/F.	[8]	Apply	CO3
4.	Explain Charecteristics of IC's.	[8]	Understanding	CO5
5.	Explain TTL Logic for family 3 input NAND gate .	[8]	Design	CO5
6.	Design a sequence genrator using T F/Fs. 0->1->7->4>2->0	[8]	Design	CO3

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Time Allowed: 2 hrs Max Marks: 40

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