

Enrolment No.

SOE23201010003



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PIMPRI CHINCHWAD EDUCATION TRUST
Pimpri, Chinchwad, Maharashtra - 411 004

SCHOOL OF ENGINEERING & TECHNOLOGY

End Semester Assessment – Nov/Dec 2024

Program :	B.Tech	Batch :	2023-2027	Semester :	III
Course Code & Name :	UBTCE203- Python Programming				
Maximum Marks :	60	Time:	2.5 Hrs		
Course Outcomes (CO):					
<ol style="list-style-type: none"> To learn the fundamentals of the Python programming language. To create Python list tuple to represent compound data. To write and execute simple as well as complex Python programs. To analyse the concepts of procedural as well as object-oriented Python programs. To perform files handling operations and handle exceptions using Python. 					
Instructions :					
- All questions are compulsory, And Assume missing data suitably, if any.					

QUESTIONS

QUESTIONS		CO	BTL	Marks
Q 1) Solve all questions.		Max Marks: 10		
a. ✓	Find the maximum and minimum in given list using python program. list is L1=(100,200,60,400,500).	CLO1	B4	05
b. ✓	Differentiate the list and set in python.	CLO1	B1	05
Q 2) Solve all questions.		Max Marks: 10		
a. ✓	Explain any five random functions in python with example.	CLO2	B2	05
b. ✓	Write a python program to find the grade of student if five subjects marks given by teacher. Assume suitable grade categorization using nested if-else.	CLO2	B4	05
Q 3) Solve any two questions.		Max Marks: 10 (2*5)		
a. ✓	Write a Python program to count the number of vowels and words in a given string. Take input string from user.	CLO3	B3	05
b.	Describe the binary search with example.	CLO3	B1	05
c. ✓	Write a python program to check the equality of two strings entered by user.	CLO3	B4	05
Q 4) Solve any two questions.		Max Marks: 10 (2*5)		
a. ✓	Demonstrate the operator overloading with example in python.	CLO4	B3	05
b.	Write a python program to implement sorting using arbitrary arguments.	CLO4	B5	05
c. ✓	Explain polymorphism with example in python. smide	CLO4	B2	05
Q 5) Solve any two questions.		Max Marks: 20 (2*10)		
a. ✓	Create custom exception for error handling for user defined program error handling.	CLO5	B5	10
b.	Write a python program to perform all file handling operations on binary file.	CLO5	B5	10
c. ✓	Explain ValueError, TypeError, ZeroDivisionError, IndexError and nameError with example.	CLO5	B4	10



SCHOOL OF ENGINEERING & TECHNOLOGY

End Semester Assessment – Nov/Dec 2024

Program :	B.Tech	Batch :	2023-2027	Semester :	III/V
Course Code & Name :	UBTCE205A Digital Logic & Microprocessor				
Maximum Marks :	60	Time:	2.5 Hrs		

Course Outcomes (CO):

- To understand the basics of Digital fundamentals, Boolean algebra, its applications and combinational logic circuits in digital systems.
- Study various combinational digital circuits using logic gates.
- Study, analysis and design of clocked sequential circuits.
- To get acquaint students with the asynchronous Sequential Circuits and Design of Hazard free circuits.
- To learn the architecture and pin configuration of 8086 Microprocessor.

Instructions :

- All questions are compulsory.
- Assume missing data suitably, if any.
- Draw well labelled diagrams wherever necessary

QUESTIONS		CO	BTL	Marks
Q 1) Solve all questions.		Max Marks: 10		
a. ✓	(i) Convert (1100) gray number into binary number ✓	CO1	B1	2.5
	(ii) Find the decimal number of the given excess-3 number (110010100011.01110101) ✓	CO1	B1	2.5
b. ✓	(i) Design OR gate using NAND gates ✓	CO1	B4	02
	(ii) Simplify the expression for $Y(A,B,C) = \sum m(0,2,3,6,7)$ ✓	CO1	B4	03
Q 2) Solve all questions.		Max Marks: 10		
a. ✓	Evaluate 2 bit comparator with circuit diagram. ✓	CO2	B5	05
b. ✓	Design a full adder circuit using two half adder. ✓	CO2	B6	05
Q 3) Solve any two questions.		Max Marks: 10 (2*5)		
a.	Describe master slave flip flop with the waveforms.	CO3	B1	05
b. ✓	Analyse the universal shift register using D flip flop. ✓	CO3	B4	05
c. ✓	Implement 3 bit ripple counter. <i>async.</i>	CO3	B3	05
Q 4) Solve any two questions.		Max Marks: 10 (2*5)		
a. ✓	Interpret race around condition in J K flip flop. ✓	CO4	B2	05
b. ✓	An asynchronous sequential circuit is described by the following excitation and output function	CO4	B4	05

	$Y = x_1 x_2 + (x_1 + x_2) y$ $Z = Y$ <p>(i) Draw the logic diagram (ii) Derive its transition table and flow table.</p>			
c.	<p>Analyse the asynchronous sequential circuit</p>	CO4	B4	05
Q 5) Solve any two questions.		Max Marks: 20 (2*10)		
a.	Differentiate between direct and indirect addressing mode.	CO5	B2	10
b.	Explain the components of 8086 microprocessor. ✓	CO5	B2	10
c. ✓	(i) Describe what is external memory interfacing. ✓	CO5	B1	05
	(ii) Explain any 5 instructions of 8086. ✓	CO5	B1	05

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End Semester Assessment – Nov/Dec 2024

Program :	B.Tech	Batch :	2023-2027	Semester:	III
Course Code & Name :	UBTCE208 Operating System				
Maximum Marks :	60	Time:	3 Hrs		

Course Objectives (CO): The objectives of (Operating System) are:

1. To introduce basic concepts and functions of modern operating systems.
2. To comprehend the concept of process, thread management and scheduling.
3. To learn the concept of concurrency control.
4. To study various Memory Management techniques.
5. To know the concept of I/O and File management

Instructions :

- All questions are compulsory.
- Assume missing data suitably, if any.
- Draw well labeled diagrams wherever necessary

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QUESTIONS		CO	BTL	Marks																			
Q 1) Solve the two questions.		Max Marks: 10																					
a. ✓	Explain different functions/services of the OS?	CO1	B3	05																			
b. ✓	Describe modern operating systems and virtual machines?	CO1	B2	05																			
Q 2) Solve the two questions.		Max Marks: 10																					
a. ✓	Consider the following set of processes where the arrival time & burst time is shown in table:		CO2	B3	05																		
	<table border="1"> <thead> <tr> <th>Process name</th> <th>Arrival time</th> <th>Burst time</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>10</td> </tr> <tr> <td>P2</td> <td>0</td> <td>6</td> </tr> <tr> <td>P3</td> <td>1</td> <td>7</td> </tr> <tr> <td>P4</td> <td>1</td> <td>4</td> </tr> <tr> <td>P5</td> <td>2</td> <td>5</td> </tr> </tbody> </table>	Process name				Arrival time	Burst time	P1	0	10	P2	0	6	P3	1	7	P4	1	4	P5	2	5	
	Process name	Arrival time				Burst time																	
	P1	0				10																	
	P2	0				6																	
	P3	1				7																	
	P4	1				4																	
P5	2	5																					
Calculate waiting time and Turn-around time of each process? <u>Using SJE</u>																							
b. ✓	Explain Process and Threads & differentiate between them with minimum five points?	CO2	B3	05																			

Q 3) Solve any two questions.																	Max Marks: 10 (2*5)				
a. \	Assume the Table given State whether the Processes are in Safe State or not if yes then State the process? With the help of Bankers's Algorithm.																CO3	B3	05		
	Process		MaxNeed				Allocated				Remaining need				Available						
		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C				D	
	P0	0	0	1	2	0	0	1	2					1	5	2				0	
	P1	1	7	5	0	1	0	0	0												
	P2	2	3	5	6	1	3	5	4												
	P3	0	6	5	2	0	6	3	2												
P4	0	6	5	6	0	0	1	4													
b. \	Compare different types of partitioning along with their algorithms.																CO3	B3	05		
c. ✓	Elaborate Dining Philosopher's Problem with the help of suitable example and diagram?																CO3	B4	05		
Q 4) Solve any two questions.																	Max Marks: 10 (2*5)				
a. \	Explain Thrashing and Paging with the help of suitable example and diagram?																CO4	B3	05		
b. ✓	Consider following page reference string 4 3 2 1 4 3 5 4 3 2 1 5 Assume Frame Size = 3. How many Page Fault would occur for FIFO and LRU?																CO4	B3	05		
c. ✓	Differentiate between Paging and Segmentation with suitable parameters?																CO4	B4	05		
Q 5) Solve any two questions.																	Max Marks: 20 (2*10)				
a. ✓	Explain different types of File Allocation Methods in I/O Management?																CO5	B3	10		
b. ✓	Define Seek Time and assume a Disk with 200 tracks and disk request of queue has random request in it. The requested tracks in the order received by disk scheduler are 50,55,30,18,25,89,140,145,35,190 starting at track 100. Calculate the average seek length using C-SCAN, LOOK and C-LOOK. Give which scheduling is best for scenario?																CO5	B5	10		
c. \	Define Rotational Latency and assume a disk with 1000 cylinders, numbers 0 to 999, compute the number of tracks, the disk arm must move to satisfy the entire requests in the disk queue. Assume the last request service was at track 345 and the head is moving toward track 0. The queue in FIFO order contains requests for the following tracks: 123, 874, 692, 475, 105, and 376. Find the seek length for the following scheduling algorithm. a) SSTF b) LOOK c) C-SCAN																CO5	B5	10		

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SCHOOL OF ENGINEERING & TECHNOLOGY

End Semester Assessment – Nov/Dec 2024

Program:	B. Tech	Batch: NY	2023-2027	Semester:	III
Course Code & Name:	Data Structures and Algorithms (UBTCE201/PC/C)				
Maximum Marks:	60	Time: 9:30 To	12:00 noon	2.5 Hrs	

Course Outcomes:

1. Students will be able to describe Data Structures and Algorithms.
2. To gain the knowledge about the concept of linked list.
3. To use and apply the concept of stack and queue.
4. To categorize the use of searching and sorting techniques.
5. Implement Non-Linear Data Structures like Trees and graphs using programming language.

Instructions:

- All questions are compulsory.
- Assume missing data suitably, if any.
- Draw well labeled diagrams wherever necessary

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QUESTIONS		CO	BTL	Marks
Q 1) Solve any two questions.		Max Marks: 10		
a. >	Compare Linear & Non-Linear Data Structure	CO1	B4	05
b.	Explain divide and conquer strategy with an example	CO1	B2	05
c. >	Construct a flowchart to compute the sum of n integers along with its pseudocode.	CO1	B3	05
Q 2) Solve any two questions.		Max Marks: 10		
a.	Summarize advantages and disadvantages of singly linked list and doubly linked list.	CO2	B2	05
b. >	Illustrate pseudocode inserting a node at a beginning position in a singly linked list.	CO2	B5	05
c. >	Define a linked list? State and explain types of Linked List.	CO2	B1	05
Q 3) Solve any two questions.		Max Marks: 10 (2*5)		
a. >	Convert the infix expression $(2 + 3) * (4 - 1)$ to postfix form, then evaluate the resulting postfix expression	CO3	B5	05
b.	State and Explain applications of queue. How to implement queue with an array?	CO3	B4	05
c. >	Write Pseudo code for Push () and POP () operations on stack.	CO3	B3	05
Q 4) Solve any two questions.		Max Marks: 10 (2*5)		
a. >	Apply Binary Search to search number 80 from 10,12,20,32,50,55,65,80,99.	CO4	B3	05

b.	Solve following problem 13,11,14,15,19,12,16,18 Sort using Merge sort	CO4	B3	05
c. ✓	Write pseudo code for Bubble Sort.	CO4	B4	05
Q 5) Solve any two questions.		Max Marks: 20 (2*10)		
a. ✓	<p>Draw the minimum spanning tree for the given graph using Prim's algorithm.</p>	CO5	B5	10
b. ✓	For the given the expression $((A + B) * (C - D))$, construct binary tree and perform an Inorder, Preorder, Postorder traversal.	CO5	B4	10
c. ✓	Given a list of integers [50, 30, 70, 20, 40, 60, 80], apply the binary search tree insertion algorithm to construct a binary search tree. Write the pseudocode for the insertion process and show the structure of the tree after each insertion.	CO5	B3	10

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End Semester Assessment – Nov/Dec 2024

Program :	B.Tech	Batch :	2023-2027	Semester :	III
Course Code & Name :	UBTCE207 Discrete Mathematics				
Maximum Marks :	60	Time:	2.5 Hrs		

Course Outcomes (CO):

- To familiarize the students with the concepts and techniques of logics & sets.
- To recognize relations and its real-life application.
- To comprehend Algebraic structure and its application.
- To acquire the knowledge of graph theory
- To acquire the knowledge of trees to understand the concepts of different types of algorithms and its applications that would enhance analytical thinking power.

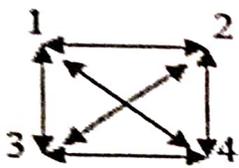
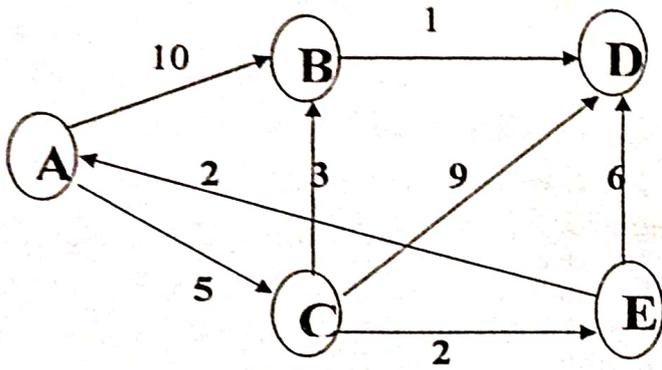
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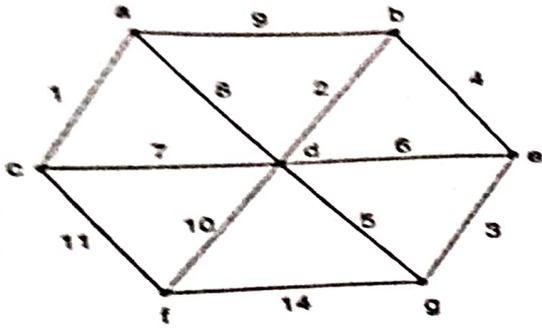
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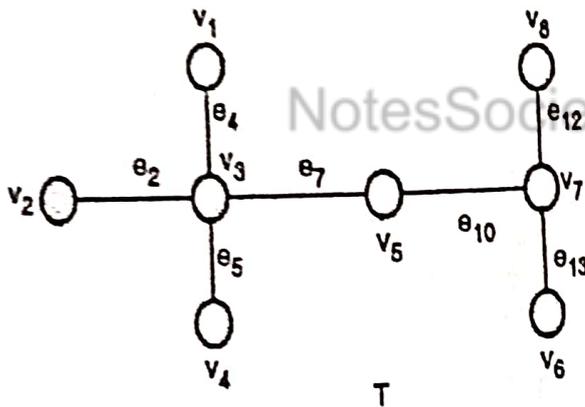
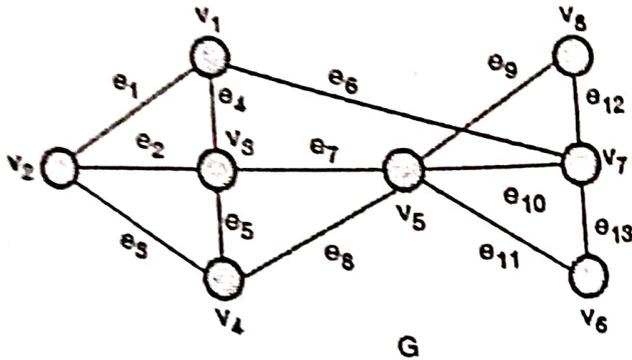
QUESTIONS		CO	BTL	Marks
Q 1) Solve all questions.		Max Marks: 10		
	Prove by constructing the truth table: i) $P \rightarrow (Q \vee R) = (P \rightarrow Q) \vee (P \rightarrow R)$ ✓ ii) $(P \rightarrow Q) \leftrightarrow (\sim P \vee Q)$ is tautology. ✓	CO1	B3	05
b. ✓	Determine whether the following arguments are valid or invalid. i) ✓ If Aryan study hard. He will obtain first class and he will get a good job. Therefore if Aryan studies hard, he will get a good job. ii) ✓ If Geeta goes to class. She is on time. But Geeta is late. She will therefore miss the class. iii) ✓ I am happy if my program runs. A necessary condition for the program to run is it should be error free. I am not happy. Therefore program is not error free.	CO1	B4	05
Q 2) Solve all questions.		Max Marks: 10		
a. ✓	$A = \{1,2,3,4\}$; $B = \{1,4,6,8,9\}$; aRb if & only if $b = a^2$ Find the domain, range of R. Also find its relation matrix and draw its diagraph.	CO2	B3	05
b. ✓	Let $A = \{1,2,3,4,5,6,7,8,9,12,18,24\}$ be ordered by the relation x_2 divides y_4 . Show that the relation is partial ordering and draw the Hasse diagram.	CO2	B3	05

(P.T.O)

Q 3) Solve any two questions.		Max Marks: 10 (2*5)																											
a.	Define Algebraic System. Explain properties of binary operations.	CO3	B2	05																									
b.	Let $R = \{0^\circ, 60^\circ, 120^\circ, 180^\circ, 240^\circ, 360^\circ\}$ and $*$ is a binary operation so that a and b in R , $a*b$ is overall angular rotation corresponding to successive rotations by a and then b . Show that $(R, *)$ is a group.	CO3	B3	05																									
c.	A bit word 1011 is to be transmitted. Construct the even seven bit Hamming code for this data.	CO3	B3	05																									
Q 4) Solve any two questions.		Max Marks: 10 (2*5)																											
a.	<p>A newspaper agent daily drops the newspaper to the area assigned in such a manner that he has to cover all the houses in the respective area with minimum travel cost. Compute the minimum travel cost.</p> <p>The area assigned to the agent where he has to drop the newspaper is shown in fig:</p>  <table border="1" data-bbox="574 996 901 1176"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>1</td> <td>0</td> <td>10</td> <td>15</td> <td>20</td> </tr> <tr> <td>2</td> <td>5</td> <td>0</td> <td>25</td> <td>10</td> </tr> <tr> <td>3</td> <td>15</td> <td>30</td> <td>0</td> <td>5</td> </tr> <tr> <td>4</td> <td>15</td> <td>10</td> <td>20</td> <td>0</td> </tr> </table>		1	2	3	4	1	0	10	15	20	2	5	0	25	10	3	15	30	0	5	4	15	10	20	0	CO4	B3	05
	1	2	3	4																									
1	0	10	15	20																									
2	5	0	25	10																									
3	15	30	0	5																									
4	15	10	20	0																									
b.	List and explain the necessary and sufficient conditions for Hamiltonian and eulerian path with suitable examples.	CO4	B2	05																									
c.	<p>Find shortest path from vertex 'A' to vertex 'D' using Dijkstra's algorithm.</p> 	CO4	B3	05																									
Q 5) Solve any two questions.		Max Marks: 20 (2*10)																											
a.	Show how Kruskal's Algorithm finds a minimal spanning tree of the graph.	CO5	B4	10																									



Find the fundamental system of cut set for graph G shown in fig.a with respect to spanning tree of fig.b



CO5

B3

10

Follow the Huffman's Algorithm to find the code words for each message.
Also find the average code word length.

c.

Message	M0	M1	M2	M3	M4	M5	M6
Probability	0.25	0.25	0.125	0.125	0.125	0.0625	0.0625

CO5

B3

10