GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester)

CYCLE TEST – I

Computer Organization and Architecture

CSE, CSE (AI & ML), CSE(DS)

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. Write the basic functional unit of a computer system.	1	1
b. Differentiate Computer Organization & Architecture	1	1
c. Write the Amdahl's Law in computing system.	1	2
d. Mention the Role of Control Unit.	2	1
e. Define Microinstruction	2	3

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions	Marks	CO#	Blooms Level
2.a. What do you mean by Bus? Explain different types of bus with neat diagram.	5	1	3
b. Draw & Explain Von Neumann Architecture.	5	1	3
(OR)			
c. Write the functionality of various Registers available in A Processor.	5	1	2
d. Differentiate between RISC & CISC with block Diagram.	5	1	3
3.a. Define Instruction, Explain Instruction-Fetch Cycle with block diagram.	5	2	3
b. Evaluate the Expression in 3-Address Instruction Format with required number of operands & Instructions. X=(A+B)* (C+D)-(E/F)	5	2	3
(OR)			
c. Define Addressing Mode & Explain about at least 5 addressing modes with suitable examples.	5	2	2
d. Explain in details about Design & Architecture of ALU with block diagram.	5	2	3

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B. Tech (Fourth Semester)

CYCLE TEST – I

Operating System

Time: 75 Minutes | Maximum: 30 Marks

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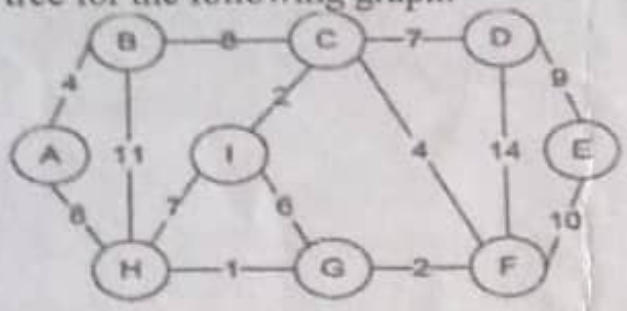
PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions	CO #	Blooms Level
a. Differentiate between hard and soft real time system.	CO1	BL2
b. What is kernel? Explain types of kernel.	CO1	BL1
c. Illustrate the use of fork() and exec() system calls.	CO2	BL2
d. Explain the need of context switch in operating system.	CO2	BL2
e. What is meant by long-term and short-term schedulers?	CO2	BL1

PART – B **(10 x 2 = 20 Marks)**

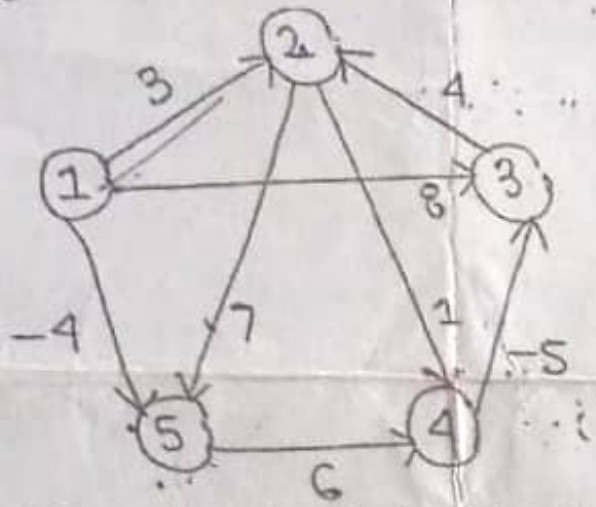
Answer ALL Questions	Marks	CO#	Blooms Level
2.a. What is Operating System? Explain different types of OS.	5	CO1	BL2
b. Write a short note on "System Call" with an example.	5	CO1	BL1
(OR)			
c. What is a process control block? Explain all the components of it.	5	CO2	BL2
d. Define process and Explain process states in details with diagram.	5	CO2	BL1
3.a. Consider 6 processes P1,P2,P3,P4,P5,P6 whose arrival times are 0,1,2,3,4,5 and burst times are 8,4,2,1,3,2 respectively. Calculate average waiting time using SRTF algorithm.	5	CO2	BL3
b. What are the functions of operating system? Explain in detail.	5	CO1	BL2
(OR)			
c. Consider 6 processes P1,P2,P3,P4,P5,P6 whose arrival times are 0,1,2,3,4,6 and burst times are 5,6,3,1,5,4 respectively. The time quantum is 4 seconds. Calculate average waiting time using Round Robin algorithm.	5	CO2	BL3
d. Write short notes on "Scheduling criteria".	5	CO1	BL1

c. Write Kruskal's Algorithm to find minimum spanning tree for the following graph.



5 3 4

d. Find the shortest path from node '1' using Bellman Ford Algorithm.



5 3 4

3.a. Find a solution using sum of subset algorithm for a problem with weights W={1,4,9,11,12,14,17}, and Sum=30. Derive all the subsets — 5 4 3

b. Define Back Tracking. Find the solution of 4 Queen problem using backtracking. — 5 4 3

(OR)

c. Explain the Travelling salesmen problem using Approximation technique with example — 5 4 3

d. Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class — 5 4 2

GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester)

CYCLE TEST – II

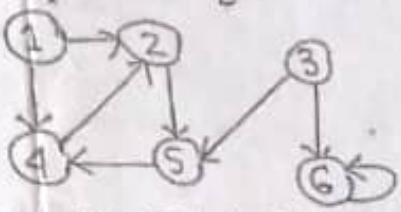
Design and Analysis of Algorithms

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

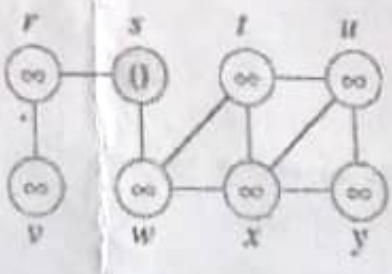
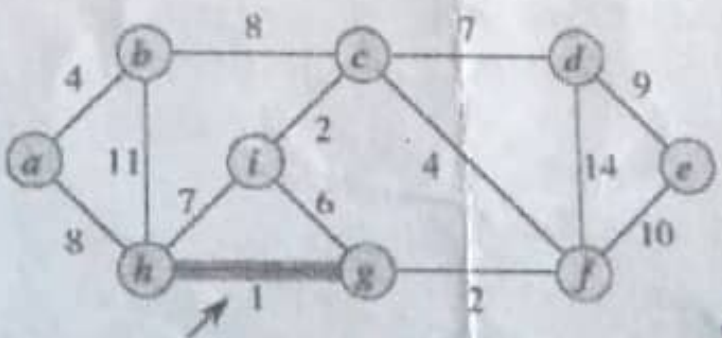
PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ALL questions

		CO #	Blooms Level
a.	Compare Greedy algorithm and Dynamic programming	3	3
b.	Draw the state space tree for the arrangement of two boys and one girl students to stand in a row.	3	2
c.	Define Spanning Tree and Minimum Spanning Tree. List the number of spanning trees of a Graph of N edges.	3	4
d.	Find the Adjacency List and Adjacency Matrix representation of the graph. 	4	4
e.	Find the Pi table values for the pattern="AABAAABAC"	4	3

PART – B **(10 x 2 = 20 Marks)**

Answer ALL Questions

		Marks	CO#	Blooms Level
2.a.	Write the BFS algorithm and solve for the following graph using BFS 	5	3	4
b.	Write the prim's algorithm and Describe minimum spanning tree using Prim's algorithm for the following graph. 	5	3	4

(OR)

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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester)

CYCLE TEST – I

Design and Analysis of Algorithms

Time: 75 Minutes | Maximum: 30 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 5 = 10 Marks)**

	Q.1. Answer ALL questions	CO #	Bloom's Level
a.	Define the role of Asymptotic Notation in Algorithm?	1	1
b.	Arrange the following class of functions in increasing Order: 5n, nlogn, n^2, 7, logn, 2^n, $\sqrt{n}$, $n^!$	1	4
c.	Define the basic principle of divide-and-conquer?	2	1
d.	Construct a min heap by taking the following set of values 2,34,23,12,78,3,19	2	3
e.	Analyse a condition when Quick Sort Algorithm takes $O(n^2)$ time in the worst case and state the procedure to solve it.	2	4

PART – B 2+2 2 3 17 19 23 34 **(10 x 2 = 20 Marks)**

Answer ALL Questions

		Marks	CO#	Bloom's Level
2.a.	Illustrate briefly on Big oh Notation , Omega Notation and Theta Notations .Give Examples	5	1	2
b.	Solve the recurrence T(n)=4T(n/2)+n using the master method.	5	1	4
	(OR)			
c.	Solve the recurrence T(n)=T(n-1)+n using the recurrence tree method.	5	1	4
d.	Solve the recurrence T(n)=T(n/2)+1 using the substitution method.	5	1	4
3.a.	Simulate Quick sort algorithm for the following example 25,36,12,4,5,16,58,54	5	2	3
b.	Sort the given list using the Merge sort 50, 40, 20, 70, 15, 35, 20, 60 15 20	5	2	3
	(OR)			
c.	Explain chain matrix multiplication for matrices A, B , C, D with dimensions sequence 5,4,6,2,7.	5	2	3
d.	Determine an LCS of <A B C B> and <B D C A B>	5	2	3