Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session – July – Dec 2021 Month - November

Semester – CSE III (A, B & C) Subject – Mathematics III Code – B000311(014)

Time Allowed: 2 Hours Maximum Marks: 40

Note: Part (A) is compulsory and attempt any two parts from B, C & D.

Q. N.	Questions	Marks	Level of Bloom's taxonomy	COs
	Unit IV			
A.	Write relation of shift operator E with Δ, ∇, δ & μ .	[4]	Remember	CO4
B.	(i) Apply Newton's forward interpolation formula to find $f(1.5)$, correct upto 3 places of decimal. (ii) Obtain the interpolating polynomial $f(x)$ by applying newtons backward interpolation satisfying the data: x : 1 2 3 4 $f(x)$: 26 18 4 1	[8]	Applying	CO4
C.	Find $\tan 14^\circ$ using Stirling's & $\tan 17^\circ$ by Bessel's formula. x° : 0 5 10 15 20 25 30 $\tan x^\circ$: 0.00 0.0875 0.1763 0.2679 0.3640 0.4663 0.5774	[8]	Applying	CO4
D.	(i) Apply Lagrange's interpolation formula to find interpolating polynomial $f(x)$ satisfying the following data. (ii) Compute $f(0)$ correct up to 3 places of decimals, by applying Newton's Divide difference formula. x : -2 -1 2 3 $f(x)$: -12 -8 3 5	[8]	Applying	CO4
	Unit V			
A.	Apply Euler's method and compute $y(0.4)$ correct up to 4 places of decimals for $\frac{dy}{dx} = \frac{y}{1+x}$, $y(0) = 2$, consider $h = 0.1$.	[4]	Understanding	CO5
B.	Apply Taylor series method to obtain $y(1.1)$, correct upto 4 places of decimal for the equation $\frac{dy}{dx} = x \cdot \sqrt[3]{y}$, $y(1) = 1$.	[8]	Applying	CO5
C.	Apply RK method of fourth order to compute $y(0.2)$, by assuming $h = 0.1$ for the equation $\frac{dy}{dx} + y + xy^2 = 0$, $y(0) = 1$, correct upto four decimal places.	[8]	Applying	CO5
D.	Apply Milne's predictor corrector method for the equation $2\frac{dy}{dx} = (1 + x^2)y^2$ to obtain $y(0.4)$, correct upto 4 decimal places. It is given $y(0.1) = 1.06, y(0.2) = 1.12$ and $y(0.3) = 1.21$.	[8]	Applying	CO5

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July – Dec, 2021 Month-Nov

Sem- CSE 3rd **(A,B&C)**

Subject-**Principles of Programming Languages**

Code-B022313(022)

Time Allowed: 2 hrs Max Marks: 40

*Note: - **All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2.***

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
A.	What is "Encapsulation"?	[2]	Understanding	CO4
B.	What are the core OOP's Concepts?	[2]	Understanding	CO4
C.	Difference between Pointer and Reference variable ? explain with Example.	[2]	Analysis	CO4
D.	Difference between Constructor and Destructor?	[2]	Analysis	CO5
	PART II			
A.	What is Dynamic Memory Allocation ? write a C++ Program for the same.	[8]	Applying	CO4
B.	Explain Nested Class with suitable example.	[8]	Applying	CO4
C.	Explain with neat diagram the compilation Process in C++	[8]	Understanding	CO4
D.	Write a Program in C++ to demonstrate the use of Operator Overlonding.	[8]	Applying	CO5

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July – Dec, 2021 Month-Nov

Sem- CSE 3rd **(A,B&C)**

Subject-**Principles of Programming Languages**

Code-B022313(022)

Time Allowed: 2 hrs Max Marks: 40

*Note: - **All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2.***

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
A.	What is "Encapsulation"?	[2]	Understanding	CO4
B.	What are the core OOP's Concepts?	[2]	Understanding	CO4
C.	Difference between Pointer and Reference variable ? explain with Example.	[2]	Analysis	CO4
D.	Difference between Constructor and Destructor?	[2]	Analysis	CO5
	PART II			
A.	What is Dynamic Memory Allocation ? write a C++ Program for the same.	[8]	Applying	CO4
B.	Explain Nested Class with suitable example.	[8]	Applying	CO4
C.	Explain with neat diagram the compilation Process in C++	[8]	Understanding	CO4
D.	Write a Program in C++ to demonstrate the use of Operator Overlonding.	[8]	Applying	CO5

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July-Dec, 2021 Month- November

Sem- CSE 3rd [A, B & C] Subject- Data Structure & Algorithms Code- B022312(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - Solve All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
Q1	What would be the asymptotic time complexity to add a node at the end of singly linked list, if the pointer is initially pointing to the head of the list? a) O(1) b) O(n) c) θ(n) d) θ(1)	[2]	Understand	CO1
Q2	What is the time complexity of pop() operation when the stack is implemented using an array? a) O(1) b) O(n) c) O(logn) d) O(nlogn)	[2]	Understand	CO2
Q3	While evaluating a prefix expression, the string is read from? a) left to right b) right to left c) center to right d) center to left to right	[2]	Understand	CO2
Q4	What is the time complexity of an infix to postfix conversion algorithm? a) O(N log N) b) O(N) c) O(N2) d) O(M log N)	[2]	Understand	CO2
	PART II			
Q1	Illustrate Asymptotic Notatios: Bigoh, Omega and Theta with proper example.	[8]	Applying	CO1
Q2	Write an algorithm to insert a node after a specific node of the Linked list	[8]	Applying	CO2
Q3	Design a C Program to create a linked list	[8]	Applying	CO2
Q4	Define polish notation. Convert the following infix expression to postfix expression using stack. ((A+B)/D)^((E-F)*G)	[8]	Applying	CO2

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Department of Computer Science & Engineering

Class Test – I Session- July-Dec, 2021 Month- November

Sem- CSE 3rd [A, B & C] Subject- Data Structure & Algorithms Code- B022312(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - Solve All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
Q1	What would be the asymptotic time complexity to add a node at the end of singly linked list, if the pointer is initially pointing to the head of the list? a) O(1) b) O(n) c) θ(n) d) θ(1)	[2]	Understand	CO1
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Q4	What is the time complexity of an infix to postfix conversion algorithm? a) O(N log N) b) O(N) c) O(N2) d) O(M log N)	[2]	Understand	CO2
	PART II			
Q1	Illustrate Asymptotic Notatios: Bigoh, Omega and Theta with proper example.	[8]	Applying	CO1
Q2	Write an algorithm to insert a node after a specific node of the Linked list	[8]	Applying	CO2
Q3	Design a C Program to create a linked list	[8]	Applying	CO2
Q4	Define polish notation. Convert the following infix expression to postfix expression using stack. ((A+B)/D)^((E-F)*G)	[8]	Applying	CO2

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July – Dec, 2021 Month -Nov

Sem- CSE 3rd [B] Subject-Operating System Code-B022315(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
A.	What do you mean by operating system?	[2]	Understanding	CO1
B.	What is kernel mode and user mode?	[2]	Understanding	CO1
C.	What is System Call? Explain with suitable example.	[2]	Analysis	CO1
D.	What is Process Control Block?	[2]	Understanding	CO2
	PART II			
A.	List 5 different services provided by operating system and explain why OS is called as resource manager?	[8]	Analysis	CO1
B.	What is need of process swapping? Explain the process life cycle with proper state transitions.	[8]	Analysis	CO2
C.	Consider following four process with the process arrival time and burst time in millisecond. **Process No. / Arrival Time / Burst Time** P1 / 0 / 5 P2 / 1 / 2 P3 / 2 / 6 P4 / 3 / 4 i) Obtain a Gantt chart using Shortest Job First (SJF) non-preemptive scheduling and compute average waiting time. ii) Obtain a Gantt chart using Round Robin (RR) preemptive scheduling and compute average turn around time waiting time.	[8]	Applying	CO2
D.	What is race condition? Explain the critical-section problem.	[8]	Understanding	CO3

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July – Dec, 2021 Month -Nov

Sem- CSE 3rd [B] Subject-Operating System Code-B022315(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - All questions from PART1 and PART2. Each question of PART1 carries 2 Marks and 8 marks for PART2.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
A.	What do you mean by operating system?	[2]	Understanding	CO1
B.	What is kernel mode and user mode?	[2]	Understanding	CO1
C.	What is System Call? Explain with suitable example.	[2]	Analysis	CO1
D.	What is Process Control Block?	[2]	Understanding	CO2
	PART II			
A.	List 5 different services provided by operating system and explain why OS is called as resource manager?	[8]	Analysis	CO1
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Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I **Session** - July – Dec, 2021 **Month** - November

Sem- CSE 3rd [A & C] Subject-Name- Operating System **Subject-Code-** B022315(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - All Questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	Section - A			
1.	How Buffering can improve the performance of a Computer system?	[2]	Understanding	CO1
2.	Explain about the dual mode operation in OS with a neat block diagram.	[2]	Understanding	CO1
3.	Enumerate the different operating system structures and explain with a neat sketch.	[8]	Understanding	CO1
4.	Show how communication takes place through a Message Passing System.	[8]	Understanding	CO2
	Section - B			
5.	Define Race Condition with example.	[2]	Understanding	CO2
6.	What is a Critical Section also explain the solution to Critical Section problem.	[2]	Understanding	CO2
7.	**a.** Draw process state diagram. Explain each transition among them in detail. **b.** What is PCB? Discuss its major fields.	[8]	Understanding	CO2
8.	Consider a system with a set of processes P1, P2, P3, P4 and their CPU Burst time, Priorities and arrival times being mentioned as below- PROCESS | BURST TIME | ARRIVAL TIME | PRIORITY P1 | 4 | 0 | 4 H P2 | 3 | 1 | 1 L P3 | 2 | 3 | 3 P4 | 2 | 4 | 2 Calculate Average Waiting Time, Average Turn Around Time, and Response Time using SJF, SRTF and Priority (Pre-emptive and Non-Preemptive) scheduling algorithms.	[8]	Applying	CO2

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I **Session** - July – Dec, 2021 **Month** - November

Sem- CSE 3rd [A & C] Subject-Name- Operating System **Subject-Code-** B022315(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - All Questions are compulsory.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	Section - A			
1.	How Buffering can improve the performance of a Computer system?	[2]	Understanding	CO1
2.	Explain about the dual mode operation in OS with a neat block diagram.	[2]	Understanding	CO1
3.	Enumerate the different operating system structures and explain with a neat sketch.	[8]	Understanding	CO1
4.	Show how communication takes place through a Message Passing System.	[8]	Understanding	CO2
	Section - B			
5.	Define Race Condition with example.	[2]	Understanding	CO2
6.	What is a Critical Section also explain the solution to Critical Section problem.	[2]	Understanding	CO2
7.	**a.** Draw process state diagram. Explain each transition among them in detail. **b.** What is PCB? Discuss its major fields.	[8]	Understanding	CO2
8.	Consider a system with a set of processes P1, P2, P3, P4 and their CPU Burst time, Priorities and arrival times being mentioned as below- PROCESS | BURST TIME | ARRIVAL TIME | PRIORITY P1 | 4 | 0 | 4 H P2 | 3 | 1 | 1 L P3 | 2 | 3 | 3 P4 | 2 | 4 | 2 Calculate Average Waiting Time, Average Turn Around Time, and Response Time using SJF, SRTF and Priority (Pre-emptive and Non-Preemptive) scheduling algorithms.	[8]	Applying	CO2

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Class Test – I Session- July-Dec, 2021 Month- November

Sem- CSE 3rd [A, B & C] Subject- Digital Electronics & Logic Design Code- B022314(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - Solved Two Que. From each part. Each que. Carries Equal Marks.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
Q1	Design a 2 bit Comparator using Logic gates.	[10]	Understand & Applying	CO2
Q2	Design a Full-subtractor using two half-subtractors & an OR gate	[10]	Understand & Applying	CO3
Q3	Design a BCD to Excess-3 Code converter.	[10]	Understand & Applying	CO2
	PART II			
Q1	Reduce the following equation using Quine McCluskey method of minimization $F(A, B, C, D) = \sum m(1, 2, 3, 5, 9, 12, 14, 15) + \sum d(4, 8, 11)$	[10]	Understand & Applying	CO1
Q2	'NAND' & 'NOR' gates are called universed gates. Justify	[10]	Understand & Applying	CO2
Q3	A Seven bit even parity hamming code is reieved as 0101110. What is the correct	[10]	Understand & Applying	CO3

Shri Shankaracharya Institute of Professional Management & Technology

Department of Computer Science & Engineering

Class Test – I Session- July-Dec, 2021 Month- November

Sem- CSE 3rd [A, B & C] Subject- Digital Electronics & Logic Design Code- B022314(022)

Time Allowed: 2 hrs Max Marks: 40

Note: - Solved Two Que. From each part. Each que. Carries Equal Marks.

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	COs
	PART I			
Q1	Design a 2 bit Comparator using Logic gates.	[10]	Understand & Applying	CO2
Q2	Design a Full-subtractor using two half-subtractors & an OR gate	[10]	Understand & Applying	CO3
Q3	Design a BCD to Excess-3 Code converter.	[10]	Understand & Applying	CO2
	PART II			
Q1	Reduce the following equation using Quine McCluskey method of minimization $F(A, B, C, D) = \sum m(1, 2, 3, 5, 9, 12, 14, 15) + \sum d(4, 8, 11)$	[10]	Understand & Applying	CO1
Q2	'NAND' & 'NOR' gates are called universed gates. Justify	[10]	Understand & Applying	CO2
Q3	A Seven bit even parity hamming code is reieved as 0101110. What is the correct	[10]	Understand & Applying	CO3