University of Mumbai

Examination 2020 under cluster 4(Lead College: PCE, New Panvel)

Program: Computer Engineering

Curriculum Scheme: Rev2016

Examination: Second Year Semester IV

Course Code: CSC405 and Course Name: Operating system

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The first UNIX OS was written in
Option A:	Java
Option B:	Pascal
Option C:	C Programming
Option D:	Machine Language
2.	Thrashing Occur when
Option A:	When requested Page is in Memory
Option B:	When Processes on system frequently access page not memory
Option C:	When Exception is thrown
Option D:	When a page is Corrupted
3.	Page Fault Occur when
Option A:	When requested Page is in Memory
Option B:	When requested Page is not in Memory
Option C:	When Exception is thrown
Option D:	When a page is Corrupted
4.	Virtual Memory is
Option A:	Largest Secondary Memory
Option B:	Smallest Secondary Memory
Option C:	Large Main Memory
Option D:	Illusion of Large Main Memory
5.	The interface is provided by the _____ to access the services of operating system,
Option A:	Assembly instructions
Option B:	API
Option C:	Library
Option D:	System calls
6.	One that is a peripheral device of the computer system is
Option A:	Keyboard
Option B:	Register
Option C:	Memory
Option D:	BIOS
7.	The Producer – Consumer problem is also known as _____

Option A:	bounded buffer
Option B:	semaphore
Option C:	Single buffer
Option D:	System call
8.	The dining – philosophers problem will occur in case of _____
Option A:	5 philosophers and 5 chopsticks
Option B:	4 philosophers and 5 chopsticks
Option C:	3 philosophers and 5 chopsticks
Option D:	6 philosophers and 5 chopsticks
9.	_____falls under the category of preemptive scheduling.
Option A:	Round robin scheduling
Option B:	First come first serve
Option C:	Priority Scheduling
Option D:	Shortest Job First
10.	The algorithm which first executes the job that came in first in the queue is
Option A:	FILO
Option B:	LIFO
Option C:	FIFO
Option D:	SJF
11.	The system can allocate resources to each process in some order and still avoid a Deadlock is a _____
Option A:	Safe state
Option B:	Unsafe state
Option C:	Safe Sequence
Option D:	Unsafe Sequence
12.	Deadlock preventive methods helps to _____
Option A:	ensure that at least one of the necessary conditions cannot hold
Option B:	ensure that all the necessary conditions do not hold
Option C:	decide if the requested resources for a process have to be given or not
Option D:	recover from a deadlock
13.	The _____is a deadlock detection algorithm that is applicable when all resources have a single instance
Option A:	wait-for graph
Option B:	Bankers Algorithm
Option C:	ostrich algorithm
Option D:	Deadlock avoidance
14.	When a process completes its normal execution , then it enters in _____ state
Option A:	aborted
Option B:	rolled back
Option C:	terminated
Option D:	queued
15.	Page table base register points at_____

Option A:	The address of a page table in memory
Option B:	The address of a page table in backing store
Option C:	The address of a program counter
Option D:	The address of a page register
16.	___ is a technique for overcoming external fragmentation
Option A:	compaction
Option B:	contraction
Option C:	paging
Option D:	concatenation
17.	Which of the following are the two parts of the file name?
Option A:	name & identifier
Option B:	identifier & type
Option C:	extension & name
Option D:	type & extension
18.	In which file allocation method ,all the pointers to scattered blocks are placed together in one location
Option A:	Contiguous Allocation
Option B:	Linked Allocation
Option C:	Indexed Allocation
Option D:	Linked List
19.	Consider a disk queue with requests for I/O to blocks on cylinders. 98 183 37 122 14 124 65 67 Considering FCFS (first cum first served) scheduling, the total number of head movements is, if the disk head is initially at 53 is?
Option A:	600
Option B:	620
Option C:	630
Option D:	640
20.	The interrupt vector contains _____
Option A:	the interrupts
Option B:	the memory addresses of specialized interrupt handlers
Option C:	the identifiers of interrupts
Option D:	the device addresses

Q2 (20 Marks)	**Solve any Four out of Six** **5 marks each**
A	What is an effect of page size on performance of operating system
B	Calculate hit ratio for LRU and FIFO page replacement policy for the following string. Page frame size is 4. Calculate the hit ratio for the same. 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2
C	Explain Shell. Explain use of chmod command in Linux.
D	Explain Data structures used in Banker's Algorithm.
E	Discuss Operating System as a Resource Manager.
F	Describe Microkernel with a diagram.

Q3 (20 Marks)	**Solve any Four out of Six** **5 marks each**		
A	Discuss the importance of "Multithreading". Differentiate between kernel and user thread.		
B	Process	Arrival Time (ms)	Burst Time (ms)
	P1	1	7
	P2	2	5
	P3	3	1
	P4	4	2
	P5	5	8
	Calculate AWT of the following processes using Shortest job first (Non-Preemptive).		
C	Discuss advantages of interrupt driven IO over Programmed IO.		
D	What is Mutual Exclusion? Explain its significance.		
E	Explain Thrashing.		
F	Given memory partitions of 150k,500k,200k,300k,550k (in order) how would each of the first fit algorithm places the processes of 220k,430k,110k,425k(in order).		

University of Mumbai

Examinations Commencing from 23rd December 2020 to 6th January 2021

Program: **Computer Engineering**

Curriculum Scheme: Rev 2016

Examination: SE Semester IV

Course Code: CSC401 Course Name: Applied Maths IV

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	If A = $\begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ the eigen values of A^3 are
Option A:	1, 27
Option B:	1,9
Option C:	0,2
Option D:	1,3
2.	The value of the integral $\int_c \frac{e^z}{z-5} dz$ where c is the circle $\|z\| = 1$ is
Option A:	$2\pi i$
Option B:	-2πi
Option C:	0
Option D:	e^5
3.	If f(z) = $\frac{2}{z-3}$, $z = 3$ is a
Option A:	Zero of f(z)
Option B:	Singular point of f (z)
Option C:	Pole of order 2
Option D:	Pole of order 3
4.	In a Maximization type of a Linear programming problem the coefficient of artificial variable in the objective function is
Option A:	–M
Option B:	M
Option C:	0
Option D:	1
5.	The moment generating function of the following distribution is

X	-2	3	1
P(X=x)	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{6}$

Option A:	$\frac{1}{3}e^{-2t} + \frac{1}{2}e^{3t} + \frac{1}{6}e^{t}$
Option B:	$\frac{1}{3}e^{2t} + \frac{1}{2}e^{-3t} + \frac{1}{6}e^{-t}$
Option C:	$\frac{1}{3}e^{t} + \frac{1}{2}e^{2t} + \frac{1}{6}e^{3t}$
Option D:	0
6.	If f(z)= $\frac{1}{z^2} + \frac{1}{z} + \frac{1}{2!} + \frac{z}{3!} + \frac{z^2}{4!} + \cdots$ then z=0 is
Option A:	A pole of order 2
Option B:	A pole of order 1
Option C:	Not a pole
Option D:	A pole of order 0
7.	A square matrix is said to be diagonalisable if it is similar to a
Option A:	Identity matrix
Option B:	Null matrix
Option C:	Upper triangular matrix
Option D:	Diagonal matrix
8.	The Kuhn -Tucker conditions can be used to solve
Option A:	Linear programming problems with inequality constraints
Option B:	Non linear programming problems with inequality constraints
Option C:	Linear programming problems with equality constraints
Option D:	Any Linear programming problem
9.	The probability of getting 4 heads in 6 tosses of a fair coin is
Option A:	$\frac{13}{64}$
Option B:	$\frac{15}{32}$
Option C:	$\frac{15}{64}$
Option D:	$\frac{11}{32}$
10.	If the objective of the Primal is to maximize with constraints of the type $\leq$ then
Option A:	Objective of the Dual is to minimize with constraints of the type $\leq$
Option B:	Objective of the Dual is to maximize with constraints of the type $\geq$

Option C:	Objective of the Dual is to minimize with constraints of the type $\geq$
Option D:	Objective of the Dual is to maximize with constraints of the type $\leq$
11.	If the Eigen values of a 3x3 matrix A are 1,3,5 then
Option A:	Determinant of A = 15
Option B:	Determinant of A = 45
Option C:	Determinant of A = 0
Option D:	Determinant of A $\neq$ 15
12.	Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called
Option A:	Null hypothesis
Option B:	Alternative hypothesis
Option C:	Composite hypothesis
Option D:	Statistical hypothesis
13.	If the Primal possesses a finite optimal then
Option A:	The dual also possesses a finite optimal solution and $Z_{min} = W_{min}$
Option B:	The dual does not possesses a finite optimal solution
Option C:	The dual also possesses a finite optimal solution and $Z_{max} = W_{min}$
Option D:	The dual also possesses a finite optimal solution and $Z_{max} > W_{min}$
14.	A variable which does not appear in the basic variable column of simplex table is
Option A:	Never equal to zero
Option B:	Always equal to zero
Option C:	Called a basic variable
Option D:	Always a slack variable
15.	In random experiment, observations of random variable are classified as
Option A:	Events
Option B:	Composition
Option C:	Trials
Option D:	Moments
16.	If x has a Poisson distribution such that P(x=k) = P(x=k+1) for some positive integer k then the mean of x is
Option A:	k
Option B:	k-1
Option C:	k+1
Option D:	2k+1
17.	If f(z) is an analytic function in a region R bounded by a simple closed curve C, then
Option A:	$\int_c f(z)dz = 2\pi i$

Option B:	$\int_c f(z)dz \neq 0$
Option C:	$\int_c f(z)dz = 2\pi i f(z_0)$
Option D:	$\int_c f(z)dz = 0$
18.	If one of the eigen values of a matrix A is zero then
Option A:	$\|A\| \neq 0$
Option B:	$\|A\| > 0$
Option C:	$\|A\| = 0$
Option D:	$\|A\| < 0$
19.	The eigen vector of A = $\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$ corresponding to eigen value $\lambda = 1$ *is*
Option A:	$\begin{bmatrix} 2 \\ 1 \end{bmatrix}$
Option B:	$\begin{bmatrix} 2 \\ -1 \end{bmatrix}$
Option C:	$\begin{bmatrix} 4 \\ 1 \end{bmatrix}$
Option D:	$\begin{bmatrix} 1 \\ -1 \end{bmatrix}$
20.	The optimal solution to the Linear programming problem Maximize Z= $3x_1 + 2x_2$ subject to the constraints $-2x_1 + x_2 \leq 1$ $x_1 \leq 2$ $x_1 + x_2 \leq 3$ and $x_1, x_2 \geq 0$
Option A:	(0,1)
Option B:	(2,1)
Option C:	(2,0)
Option D:	$(^2/_3, ^7/_3)$

Q2 **(20 Marks**	**Solve any Four out of Six** **5 marks each**
A	The probability density function of random variable X is x: 0 | 1 | 2 | 3 | 4 | 5 | 6 P(X=x): k | 3k | 5k | 7k | 9k | 11k | 13k Find K and P (X< 4)
B	Evaluate $\int_c \frac{z+6}{z^2-4}$ dz where c is the circle $\|z-2\| = 1$

C	Solve the following LPP by Simplex Method. Maximize Z= $x_1 + 4x_2$ subject to the constraints $2x_1 + x_2 \leq 3$ $3x_1 + 5x_2 \leq 9$ $x_1 + 3x_2 \leq 5$ where $x_1, x_2 \geq 0$
D	Show that A=$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}$ is Non derogatory.
E	300 digits were chosen at random from a table of random variables. The frequency of digits were as follows. Digit: 0 1 2 3 4 5 6 7 8 9 TOTAL Frequency : 28 29 33 31 26 35 32 30 31 25 300 Using χ^2 test examine the hypothesis that the digits were distributed in equal numbers in the table.
F	Evaluate $\int_c \frac{sinz}{z-\pi} dz$ where c is the circle $\|z\| = 4$

Q3. **(20 Marks)**	**Solve any Four Questions out of Six** **5 marks each**
A	The income of a group of 10,000 persons was found to be normally distributed with mean of Rs. 750 and standard deviation of Rs. 50 . What is the lowest income of richest 250 ?
B	If the Eigen values of A= $\begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -5 & -2 \end{bmatrix}$ are 1,2,2 find the eigen vectors corresponding to the eigen value $\lambda = 2$ of A.
C	A factory turns out an article by mass production methods . From the past experience it is found that 20 articles on an average are rejected out of every batch of 100. Find the mean and the variance of the number of rejected articles.
D	Write the following LPP in the standard form : Maximize z=$3x_1 + 2x_2 + 5x_3$ subject to $2x_1 - 3x_2 \leq 3$ $x_1 + 2x_2 + 3x_3 \geq 5$ $3x_1 + 2x_3 \leq 2$ where $x_1, x_2, x_3 \geq 0$
E	Verify the Cayley Hamilton theorem for the matrix A=$\begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix}$
F	Determine the poles of the function f(z) = $\frac{3z+1}{z(z-2)}$ and calculate the residues at the poles.

University of Mumbai

Examination 2020 under cluster 4 (Lead College: PCE, Panvel)

Examinations Commencing from 23rd December 2020 to 6th January 2021

Program: Computer Engineering

Curriculum Scheme: Rev 2016

Examination: SE Semester IV

Course Code: CSC 402 and Course Name: Analysis of Algorithms

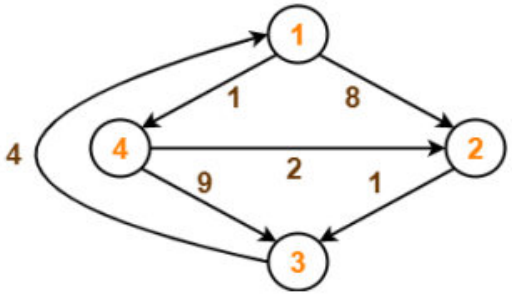
Time: 2 hour Max. Marks: 80

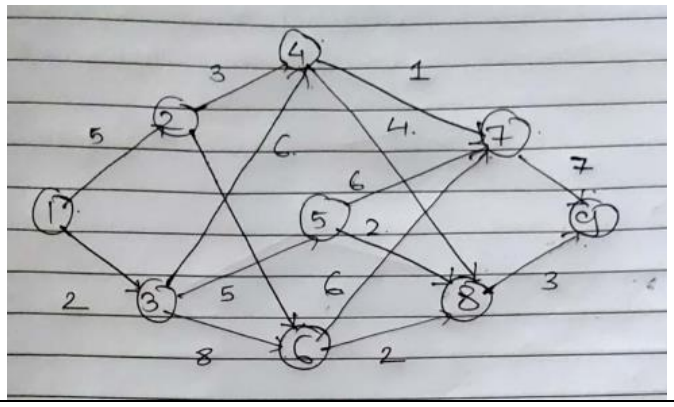
==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In general, the binary search method needs no more than _____ comparisons.
Option A:	log2n]-1
Option B:	[logn]+1
Option C:	[log2n]
Option D:	[log2n]+1
2.	Which of the following is not the internal sort.
Option A:	Insertion Sort
Option B:	Bubble Sort
Option C:	Merge Sort
Option D:	Heap Sort
3.	What is the solution to the recurrence T(n) = T(n/2)+n
Option A:	O(logn)
Option B:	O(n)
Option C:	O(nlogn)
Option D:	O(n^2)
4.	A mathematical-model with a collection of operations defined on that model is called
Option A:	Data Structure
Option B:	Abstract Data Type
Option C:	Primitive Data Type
Option D:	Algorithm
5.	The complexity of multiplying two matrices of order m*n and n*p is
Option A:	mnp
Option B:	mp
Option C:	mn
Option D:	np
6.	To solve a recurrence equation using master theorem, the equation must be of the form
Option A:	T(n)=aT(n/b)+f(n)

Option B:	T(n)=0.5T(n/1)+f(n)
Option C:	T(n)=aT(n+1/b)+f(n)
Option D:	T(n)=aT(n)+bf(n)
7.	A feasible solution that either maximizes or minimizes a given objective function is called an ……
Option A:	optimal solution
Option B:	Local solution
Option C:	exact solution
Option D:	correct solution
8.	Each of the floor function and ceiling function is a monotonically increasing function but not ……
Option A:	strictly monotonically increasing function
Option B:	monotonically decreasing function
Option C:	strictly monotonically decreasing function
Option D:	Mod function
9.	Which algorithm yields best running time for shortest path?
Option A:	Prims Algorithm
Option B:	Kruskals Algorithm
Option C:	Dijkstras Algorithm
Option D:	Bellman Ford Algorithm
10.	Strassens algorithm needs 7 multiplications to multiply two 2*2 matrices but requires more additions therefore for multiplying two n*n matrices about_____ multiplications are required.
Option A:	n^2.807
Option B:	n^4
Option C:	n^7
Option D:	n^9
11.	To find maximum and minimum in a single dimensional array using divide and conquer strategy gives complexity of _____
Option A:	O(log n)
Option B:	O(nlogn)
Option C:	O(n)
Option D:	O(n^2)
12.	Floyd Warshall's Algorithm is used for solving _____
Option A:	All pair shortest path problems
Option B:	Single Source shortest path problems
Option C:	Network flow problems
Option D:	Sorting problems
13.	You are given a knapsack that can carry a maximum weight of 60. There are 4 items with weights {20, 30, 40, 70} and values {70, 80, 90, 200}. What is the maximum value of the items you can carry using the knapsack?
Option A:	160

Option B:	200
Option C:	170
Option D:	90
14.	Longest common subsequence is an example of _____
Option A:	Greedy algorithm
Option B:	2D dynamic programming
Option C:	1D dynamic programming
Option D:	Divide and conquer
15.	What is the pre-processing time of Rabin and Karp Algorithm?
Option A:	Theta(m^2)
Option B:	Theta(mlogn)
Option C:	Theta(m)
Option D:	Big-Oh(n)
16.	The worst-case efficiency of solving a problem in polynomial time is?
Option A:	O(p(n))
Option B:	O(p(n log n))
Option C:	O(p(n^2))
Option D:	O(p(m log n))
17.	_____ is the class of decision problems that can be solved by non-deterministic polynomial algorithms?
Option A:	NP
Option B:	P
Option C:	Hard
Option D:	Complete
18.	What is a subset sum problem?
Option A:	finding a subset of a set that has sum of elements equal to a given number
Option B:	checking for the presence of a subset that has sum of elements equal to a given number and printing true or false based on the result
Option C:	finding the sum of elements present in a set
Option D:	finding the sum of all the subsets of a set
19.	How many solutions are there for 8 queens on 8*8 board?
Option A:	12
Option B:	91
Option C:	92
Option D:	93
20.	What is the number of edges present in a complete graph having n vertices?
Option A:	(n*(n+1))/2
Option B:	(n*(n-1))/2
Option C:	n
Option D:	Information given is insufficient

Q2	**Solve any Two Questions out of Three 10 marks each**
A	*State and explain Master Theorem .Solve the recurrences based on it* *a. T(n)=2T(n/4)+ n* *b. T(n)=2T(n/4)+ 1* *c. T(n)=2T(n/2)+ n* *d. T(n)=2T(n/4)+ n^2.*
B	*Solve following Knapsack Problem using dynamic Programming.* *W=8* *Pi={1,2,5,6}* *Wi={2,3,4,5,}*
C	*Find all pair shortest path from given graph.* 

Q3.	**Solve any Two Questions out of Three 10 marks each**
A	*Find the LCS for* *P=100101101101* *Q=0110*
B	*Solve the multistage graph.* 

C	*What is N Queen Problem ? Show the solution for 8 Queen problem*

University of Mumbai

Examination 2020 under cluster 4 (Lead College: Pillai College of Engineering)

Examinations Commencing from 23rd December 2020 to 6th January 2021

Program: **Computer Engineering**

Curriculum Scheme: 2016

Examination: SE Semester: IV

Course Code: CSC403 and Course Name: Computer Organization and Architecture

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The addressing mode that adds the displacement and the index register to get the effective address of the operand is called
Option A:	Index addressing mode
Option B:	Base-Index addressing mode
Option C:	Register-index addressing mode
Option D:	Relative addressing mode
2.	Which of the following statement is false
Option A:	RISC is costlier than CISC
Option B:	RISC is faster than CISC
Option C:	RISC is load store architecture
Option D:	CISC has more number of addressing modes than RISC
3.	For a computer based on 3-address instruction format each address field is used to specify which of the following?
Option A:	Either memory operand or a processor register
Option B:	Either a processor register or an immediate constant data
Option C:	Only a processor register and an immediate constant data
Option D:	A Memory operand with processor register and an immediate constant data
4.	Given the following binary number in 32 bit single precision IEEE 754 format 01000001000101000000000000000000. What is the equivalent decimal value?

Option A:	+8.25
Option B:	-8.25
Option C:	+9.25
Option D:	-9.25
5.	Which among the following is true?
Option A:	The memory allocated to each page is contiguous.
Option B:	The offset is different in a virtual address and a physical address
Option C:	Logical address space can be smaller than physical address space
Option D:	Segmentation avoids external memory fragmentation
6.	When a request to the page that is not present in the main memory is accessed then which of the following given below will be triggered
Option A:	Interrupt
Option B:	Request
Option C:	Page fault
Option D:	Page miss
7.	Consider a direct mapped Cache memory of size 1Mbyte and a 32 bit addresses. If the block size is 512 byte. The number of tag bits is
Option A:	11
Option B:	13
Option C:	12
Option D:	10
8.	Which of the following statements is/are correct in regards of memory
Option A:	As we move away from the processor ,the speed increases
Option B:	The smallest and fastest memory are always closer to the processor
Option C:	The memory that is farthest away from processor is the costliest
Option D:	The memory that is smallest is the farthest.

9.	Which of the following types of memory is used for cache memory?
Option A:	SRAM
Option B:	DRAM
Option C:	EDORAM
Option D:	SDRAM
10.	Which of the Following is true in case about interrupts?
Option A:	They are generated when memory cycles are stolen
Option B:	They are used in place of data channels.
Option C:	They can be generated by arithmetic operation
Option D:	They can indicate completion of an I/O operation
11.	A Translation Lookaside Buffer is used to stored ……...?
Option A:	System dumps
Option B:	Physical addresses
Option C:	Program data
Option D:	Operating system log files
12.	In a multiprocessor system, data inconsistency may occur among adjacent levels or within the same level of the memory hierarchy is called as
Option A:	Bus contention
Option B:	Cache Coherence
Option C:	Data loss
Option D:	Cache hit
13.	The use of DMA interface unit eliminates the need of CPU registers to transfers data from
Option A:	MAR to MBR
Option B:	MBR to MAR
Option C:	I/O units to memory
Option D:	Memory to I/O units

14.	Consider a cache of size 1024 bytes and having 64 blocks. The number of bits required to read a word form a block of cache memory is _____.
Option A:	5
Option B:	4
Option C:	8
Option D:	10
15.	In Booth's algorithm when the value of Q0Q-1 is 00 then
Option A:	AC=AC+M
Option B:	AC=AC-M
Option C:	Arithmetic shift Right AC,Q,Q-1
Option D:	shift Right AC,Q,Q-1
16.	What is function of MAR ?
Option A:	Read/write a word form memory
Option B:	Specify an address of memory
Option C:	Contains the 8 - bit op code
Option D:	Store address of next instruction
17.	Busy waiting condition occur during which type of interrupt handling mode for I/O
Option A:	Interrupt driven I/O
Option B:	Programmed driven I/O
Option C:	DMA
Option D:	Both Interrupt Driven I/O and Programmed driven I/O
18.	Which of the following is hardware generated signal
Option A:	Interrupt
Option B:	Trap
Option C:	Both Interrupt and Trap

Option D:	Neither interrupt and Trap
19.	A floating point number that has a 0 in the MSB of mantissa is said to have
Option A:	Overflow
Option B:	Underflow
Option C:	Important number
Option D:	Undefined
20.	In the case of bus arbitration process once the bus is granted to a device
Option A:	It activates the BUS busy line
Option B:	Performs the required operation
Option C:	Raises an interrupt
Option D:	It activates the Ready signal

Q2 **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	Differentiate between paging and segmentation
ii.	Define instruction pipelining and explain its various hazards in brief.
iii.	Explain IEEE 754 standards for Floating Point number representation?
B	**Solve any One** **10 marks each**
i.	Calculate the following using Booths algorithm . (+13)*(-6)
ii.	Explain the different types of data transfer techniques.

Q3. **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	Explain Characteristics of memory ?
ii.	Describe different types of addressing modes with examples for each type
iii.	Write a small note on principal of locality
B	**Solve any One** **10 marks each**
i.	Write short note on Superscalar Organization
ii.	Write short note on Flynn's Classification of Computer Architectures

University of Mumbai

Examination 2020 under cluster 4 (Lead College: PCE , New Panvel)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: Computer Engineering

Curriculum Scheme: Rev 2016

Examination: SE Semester IV

Course Code: CSC 404 and Course Name: Computer Graphics

Time: 2 hour Max. Marks: 80

==========

Q1.	For a RGB Color display, if the resolution is 1024 X 800 and the frame buffer architecture uses 8 bits / Color / pixel organization, then how many colors a pixel is capable of assuming.
Option A:	24
Option B:	2^8
Option C:	2^{24}
Option D:	2^3
Q2.	_____ gives the ratio of vertical points to horizontal points necessary to produce equal length lines in both directions on the screen.
Option A:	Resolution
Option B:	Aspect ratio
Option C:	Color depth
Option D:	Intensity value
Q3.	For a line segment between (15,15) and (20,5) , the step size in y direction used by DDA algorithm will be _____.
Option A:	+1
Option B:	-2
Option C:	-1
Option D:	0.5
Q4.	_____ is regarded as symmetric about its octant.
Option A:	Any polygon
Option B:	Ellipse
Option C:	Any Curve
Option D:	Circle
Q5.	Given the center point coordinates (0, 0) and radius as 10, What is the initial decision parameter for Mid-point circle drawing algorithm?
Option A:	9
Option B:	-10
Option C:	-9
Option D:	10
Q6.	A circle with diameter 10 is centered at (Xc,Yc). To convert it into ellipse with a center at (Xe,Ye), semi major along x axis = 10 and semi minor along y axis = 5 , the sequence of transformations should be _____
Option A:	Translation(-Xe,-Ye)→Scaling(1,0.5)→Translation(Xc,Yc)
Option B:	Translation(-Xc,-Yc)→Scaling(1,0.5)→Translation(Xe,Ye)
Option C:	Translation(Xc,Yc)→Scaling(1,2)→Translation(Xe,Ye)
Option D:	Scaling(1,0.5)→Translation(-Xc,-Yc)→ Translation(Xe,Ye)

Q 7	If we rotate a point (x,y) w.r.t Origin then _____
Option A:	The distance of point from origin, before and after rotation depends on angle of rotation
Option B:	The distance of point from origin, before and after rotation remains same
Option C:	The distance of point from origin, Always increases
Option D:	The distance of point from origin, Always decreases
Q8.	For clipping a line _____ algorithm always generates the result in a single pass.
Option A:	Cohen Sutherland
Option B:	Liang Barsky
Option C:	Midpoint subdivision
Option D:	Sutherland Hodgman
Q9.	_____ Clipping algorithm uses the pipeline comprising of Left Clipper → Right Clipper→Bottom Clipper→Top Clipper.
Option A:	Liang Barsky Line
Option B:	Cohen Sutherland Line
Option C:	Sutherland Hodgman Polygon
Option D:	Midpoint Subdivision line
Q10.	In perspective projection with COP at(0,0,-10) and XY plane as projection plane, the point (23,12,0) gets projected at ___
Option A:	(23,12)
Option B:	(13,2)
Option C:	(33,22)
Option D:	(0,0)
Q11.	In Cohen Sutherland line clipping algorithm if the region code is decided by ABRL where A is Above , B is Below , R is Right and L is Left, then what will be region code for a point (50,5) assuming (XWmin,YWmin)=(20,20) and (XWmax,YWmax)=(50,50)
Option A:	0000
Option B:	0100
Option C:	0110
Option D:	1010
Q12.	What is the full form of CSG w.r.t. solid modeling
Option A:	Common Solid Geometry
Option B:	Constructive Spline Graph
Option C:	Constructive Solid Graph
Option D:	Constructive Solid Geometry
Q13.	In Scan-line area fill method, if a scan line passes through the vertex of polygon, then the number of intersection points recorded will be even number, if vertex is ____ .
Option A:	Local Minima or Local Maxima
Option B:	the first vertex
Option C:	The last vertex
Option D:	Any vertex other than first or last vertex
Q14.	-------Curve allow us to change the no. of control points without changing the degree of polynomial
Option A:	Bezier
Option B:	B-Spline
Option C:	Koch
Option D:	Hilbert's

Q15.	Depth Buffer Algorithm comes under the category of
Option A:	Object space method
Option B:	Image space method
Option C:	System space method
Option D:	Polygon space method
Q16.	For a bi-level display, how many intensity levels are supported by halftone method, if **n X n** size grid is used .
Option A:	2*n
Option B:	n*n+1
Option C:	n*n
Option D:	N
Q17.	------- is an example of intensity interpolation technique
Option A:	Gouraud shading
Option B:	Phong shading
Option C:	Continuous shading
Option D:	Fast Phong shading
Q18.	If a point (10,20,30) is reflected about YZ-plane then the coordinates of reflected point will be ___.
Option A:	(-10,-20,30)
Option B:	(10,-20,-30)
Option C:	(-10,20,-30)
Option D:	(-10,20,30)
Q19.	If window specifications are (10,10) and (40,50), then q1,q2,q3 and q4 for a line segment between (15,5) and (30,25) using Liang Barsky line clipping algorithm will be _____.
Option A:	5,25,-5,45
Option B:	5,20,-5,15
Option C:	5,-20,-5,-15
Option D:	-5,-25,-5,-45
Q20.	If a transformed point (x',y') is calculated as x'=xf+(x-xr)*m and y'=yf+(y-yr)*n , then what can be the sequence of transformations involved ?
Option A:	Translation→Scaling→Translation
Option B:	Scaling→Translation→Translation
Option C:	Translation→Scaling→Rotation
Option D:	Translation→Rotation→Scaling

Q2.	**Solve any Four out of Six 5 marks each**
A	Compare raster scan and random scan display systems
B	Interpret the raster locations that would be chosen by DDA algorithm to scan-convert a line from a point (10,4) to a point (15,8).
C	Prove that the two successive rotation transformation are additive in nature i.e. R(θ1) + R(θ2) = R(θ1+ θ2)
D	Explain Even Odd rule of Inside/Outside test with suitable diagram.
E	Compare Perspective and Parallel projection.
F	Illustrate the steps involved in rendering a polygon surface using Gouraud Shading.

Q3.	Solve any Two Questions out of Three 10 marks each
A	Identify the sequence of transformations and find the composite transformation for reflecting a point (x1,y1) w.r.t. a line y=m*x
B	What is Window to Viewport transformation? Explain how to map a point in window at (xw,yw) to a viewport point (xv,yv) assuming that the window extents are (XWmin,YWmin) , (XWmax,YWmax) and viewport extents are (XVmin,YVmin) , (XVmax,YVmax). What all geometric transformations are involved in this mapping.
C	Explain the following methods used for solid representation : i. CSG ii. Sweep Representation