933A1

Duration : 75 Minutes

Register No.:

..... Name :

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2023

COMPUTER SCIENCE AND ENGINEERING

(2020 SCHEME)

Course Code : 20CST308

Course Name : Comprehensive Course Work

Max. Marks :50

PART A

	(Answer all questions. Each qu	uestic	on carries 1 mark)				
1	What is the time complexity of the following code:						
	int a = 0;						
	for $(i = 0; i < N; i++)$ {						
	for $(j = N; j > 1; j)$ {						
	a – a + I + J;						
	}						
	A. O(N * Sqrt(N))	в.	O(N*N)				
	C. $O(N*log(N))$	D.	O(N)				
2	What does 'stack underflow' refer to?						
	A. accessing item from an undefined stack	в.	adding items to a full stack				
	C. removing items from an empty stack	D.	index out of bounds exception				
3	If several elements are competing for the same bucket in the hash table, what is i called?						
	A. Diffusion	В.	Collision				
	C. Replication	D.	Duplication				
4	What is the time, and space complexity of	of the	following code:				
	int $a = 0, b = 0;$						
	for $(1 = 0; 1 < N; 1++)$ {						
	a = a + rand();						
	for $(i = 0; i < M; i++)$						
	b = b + rand();						
	}						
	A. $O(N * M)$ time	В.	O(N + M) time				
	C. $O(N / M)$ time	D.	None of these				
5	What is the time complexity of the following code:						
	$\inf_{x \to y} 1, y, k = 0;$						
	for $(i = 2; i \le n; i = i * 2)$						
	k = k + n / 2;						
	}						
	}	_					
	A. O(n^2)	В.	O(n)				
	C. $O(n \log n)$	D.	O(n^2Logn)				
6	Which of the following case does not exist in complexity theory?						
	A. Best case	В.	Worst case				
	C. Average case	D.	Null case				
7	7 In the algorithm, the disk arm goes as far as the final request in e						
	direction, then reverses direction immediately without going to the end of the disk.						

	А.	LOOK	в.	SCAN			
	C .	C-SCAN	D.	C-LOOK			
8	A systematic procedure for providing the CPU to new process is known as						
	A .	Context Switching	В.	Synchronization			
	С.	Deadlock	D.	Semaphore			
9	For an effective operating system, when to check for deadlock?						
	А.	Every time a resource request is made at fixed time intervals	В.	At fixed time intervals			
	C.	Every time a resource request is made	D.	None mentioned			
10	System calls of the operating system provides interface to						
	A .	programs	В.	processes			
	С.	services	D .	Utilities			
11	Which one of the following is the deadlock avoidance algorithm?						
	A.	Round-robin algorithm	В.	Banker's algorithm			
1.0	С.	Elevator algorithm	D.	Karn's algorithm			
12	Which of the following condition is required for a deadlock to be possible?						
	А.	A process may hold allocated resources while awaiting assignment of other resources	В.	No resource can be forcibly removed from a process holding it			
	С.	Mutual exclusion	D.	All of the mentioned			
13	Wh	ich of the following is not a special-pu	irpos	e registers used by CPU?			
	А.	Program counter (PC)	B .	Stack Register			
	С.	Accumulator	D.	Memory address register			
14		is the branch logic that provide	es dec	cision-making capabilities in the			
	control unit:						
	A .	Unconditional transfer	В.	Controlled transfer			
	С.	Conditional transfer	D.	None of these			
15	The	e size of virtual memory depends on th	ne siz	e of the			
	A .	data bus	В.	main memory			
	C .	address bus	D.	none of the above			
16	Which of the architecture is power efficient?						
	A .	RISC	В.	CISC			
	С.	Both A and B	D.	None of the above			
17	What does VLIW stands for?						
	A .	Very Large Instruction Word	В.	Very Long Instruction Word			
	С.	Very Long Instruction Width	D.	Very Long Instruction Width			
18	The main components (or basic units) of a computer system are						
	A .	Central Process Unit (CPU)	В.	Input/Output unit			
	С.	Memory unit (Storage unit)	D.	All of the above			
19	Whi	ich of the following is a Data Model?					
	A .	Entity-Relationship model	В.	Relational data model			
	С.	Object-Based data model	D.	All of the above			
20	Relations produced from E - R Model will always be in						
	A .	1 NF	в.	2 NF			
	C .	3 NF	D.	4 NF			
21	Wh	ich of the following is correct?					
	А.	B-trees are for storing data on disk and B+ trees are for main memory	В.	B-trees are for primary indexes and B+ trees are for secondary indexes			
	C.	Range queries are faster on B+ trees.	D.	The height of a B+ tree is independent of the number of records			

22	Functional Dependencies are the types of constraints that are based on						
	А.	Key	В.	Key revisited			
	С.	Superset key	D.	None of the mentioned			
23	Which normal form is considered adequate for relational database design?						
	А.	2NF	В.	3NF			
	С.	4NF	D.	BCNF			
24	A function that has no partial functional dependencies is in form :						
	A .	2NF	В.	3NF			
	С.	4NF	D.	BCNF			
25	The	e language accepted by a Turing mach	nine is	called			
	A .	Recursive Ennumerable	В.	Recursive			
06	C .	Recursive Enumerable and Recursive	D.	None of the mentioned			
26	Fin	ite state machine can recognize	-	1			
	A.	any grammar	В.	only context-free grammar			
07	C.	Both (a) and (b) $C = a + b + b + b + b + b + b + b + b + b +$	D .	only regular grammar			
27	Let S and T be language over = $\{a,b\}$ represented by the regular expressions $(a+b^*)^*$						
	A .	ScT (S is a subset of T)	B.	TcS (T is a subset of S)			
	С.	S=T	D.	SnT=Ø			
28	The	e value of n if Turing machine is defin	ed us	ing n-tuples:			
	А.	5	В.	7			
	C .	8	D.	9			
29	Let S->{ S->{ S->{ Stat A.	$\Sigma = \{0,1\}^*$ and the grammar G be: SS OS1 1S0 te which of the following is true for the Language of all and only Balanced strings Ambiguous Grammar	e give B. D.	n It contains equal number of 0's and 1's All of the mentioned			
30	Ma	x. number of states of a DFA converte	ed fror	n an NFA with n states is:			
	А.	n	В.	n^2			
	С.	2n	D.	None of these			
		PART B	6				
		(Answer all questions. Each qu	estio	n carries 2 marks)			
31	Wha int a for (a = } for (at is the time complexity of following of a = 0, b = 0; (i = 0; i < N; i++) { a + rand(); (j = 0; j < M; j++) {	code?				
	b =	b + rand();					
	, A .	O(N * M) time	В.	O(N + M) time			
	С.	O(N / M) time	D.	None of these			
32	Coi	nsider the following definition in c pro	gram	ming language			
	stru	ict node					
	{ int of strue	data; ict node * next;					

}
typedef struct node NODE;
NODE *ptr;

Which of the following c code is used to create new node? ptr=(NODE*)malloc(NODE); В. ptr=(NODE*)malloc(sizeof(NODE)); Α. ptr=(NODE*)malloc(sizeof(NODE*)); D. ptr=(NODE)malloc(sizeof(NODE)); С. There are 200 tracks on a disk platter and the pending requests have come in the 33 order - 36, 69, 167, 76, 42, 51, 126, 12, and 199, Assume the arm is located at the 100th track and moving towards track 200. If the sequence of disc access is 126, 167, 199, 12, 36, 42, 51, 69, and 76 then which disc access scheduling policy is used? LOOK В. SCAN Α. **C**. FCFS D. C-SCAN 34 A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is? 9 В. 10 А. С. 7 D. 8 35 If the main memory is of 8K and the cache memory is of 2K words. Its uses the associative mapping. Then each word of cache memory shall be 11 bits 21 bits А. В. 16 bits **C**. D. 20 bits The effective address of the following instruction is MUL 5(R1,R2). 36 Α. 5+[R1]+[R2] В. 5*([R1]+[R2]) 5+R1+R2 **C**. D. 5+(R1*R2) 37 Consider the following relation schema pertaining to a student's database: Student (rollno, name, address) Enroll (rollno, courseno, coursename) where the primary keys are shown underlined. The number of tuples in the Student and Enroll tables are 120 and 8 respectively. What are the maximum and minimum number of tuples that can be present in (Student * Enroll), where '*' denotes natural join ? 960,120 В. 120,8 Α. **C**. 960,8 D. 8,8 Which will be best query for deleting row from the table 38 DELETE FROM TABLE NAME Β. DELETE WHERE CUSTOMER-Α. WHERE CUSTOMER-STATE=" "; STATE=" "; DELETE TABLE _NAME WHERE D. DELETE FROM CUSTOMER **C**. CUSTOMER-STATE=" ": WHERE CUSTOMER-=" ": 39 Which of the following language cannot be accepted by a regular expression? Language of a set of numbers Language of a set of binary В. Α. divisible by 4 complement Language of a set of 0n1n Language of a set of string with С. D. odd number of 0 Regular Expression for the language of words containing even number of a's is? 40 (a+b)aba(a+b)a+bbaabaa А. В. С. (a+b)ab(a+b)D. (b+aba)