# 933A2

Register No.: .....

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## SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

#### SIXTH SEMESTER B.TECH DEGREE EXAMINATION (S), AUGUST 2023

#### **COMPUTER SCIENCE AND ENGINEERING**

#### (2020 SCHEME)

Course Code : 20CST308

**Course Name : Comprehensive Course Work** 

#### Max. Marks :50

## **Duration : 75 Minutes**

### PART A

### (Answer all questions. Each question carries 1 mark)

1 Given below are two statements. Statement I: Breadth-First Search is optimal when all the step costs are equal whereas uniform-cost search is optimal with any step-cost. Statement II: When all the step costs are same uniform-cost search use more nodes at depth d than the Breadth-First Search. In light of the above statements, choose the **correct** answer from the options given below. **A.** Both Statement I and Statement В. Both Statement I and Statement II II are true are false Statement I is true but D. **C**. Statement I is false but Statement Statement II is false II is true 2 Who coined the term Sparse Matrix? Α. Arthur Cayley В. Chris Messina **C**. Carl Hamacher Harry Markowitz D. 3 What is a hash table? A structure that maps values to A structure used for storage Α. В. kevs **C.** A structure that maps keys to D. A structure used to implement values stack and queue 4 If several elements are competing for the same bucket in the hash table, what is it called? Collision **A**. Diffusion Β. Replication **C**. D. Duplication The given array is  $arr = \{1, 2, 4, 3\}$ . Bubble sort is used to sort the array elements. 5 How many iterations will be done to sort the array? Α. 1 Β. 2 3 4 **C**. D. What does 'stack underflow' refer to? 6 accessing item from an В. adding items to a full stack Α. undefined stack **C.** removing items from an empty D. index out of bounds exception stack 7 System calls of the operating system provides interface to Α. programs Β. processes **C**. services D. Utilities 8 A systematic procedure for providing the CPU to new process is known as Context Switching Synchronization **A**. В. **C.** Deadlock Semaphore D. 9 Logical memory is broken into blocks of the same size called Α. В. Backing store Frames

10	In the algorithm, the disk arm goes as far as the final request in each					
	direction, then reverses direction immediately without going to the end of the disk					
	A. LOOK	В.	SCAN			
	C. C-SCAN	D.	C-LOOK			
11	A system is in the safe state if					
	<b>A.</b> The system can allocate resources to each process in some order and still avoid a deadlock	В.	There exist a safe sequence			
	<b>C.</b> All of the mentioned	D.	None of the mentioned			
12	In a timeshare operating system, when the time slot assigned to a process is					
	completed, the process switches from t	he cu	rrent state to?			
	A. Ready state	В.	Blocked state			
10	C. Suspended state	<b>D</b> .				
13	13 The size of virtual memory depends on the size of the					
	A. data bus	В.	main memory			
	<b>C.</b> address bus	D.	none of the above			
14	The memory devices which are similar to EEPROM but differ in the cost effectiveness is					
	<b>A.</b> Flash memory	в.	Blue-ray devices			
	<b>C.</b> Memory sticks	D.	CMOS			
15	What does VLIW stands for?					
	A. Very Large Instruction Word	в.	Very Long Instruction Word			
	<b>C.</b> Very Long Instruction Width	D.	Very Long Instruction Width			
16	The access time of memory isthe time required for performing any single					
	<b>A.</b> Shorter than	В.	Longer than			
	<b>C.</b> Negligible than	D.	Same as			
17	Which of the following interrupts are initiated by an instruction?					
	A. External	В.	Internal			
	C. Hardware	D.	Software			
18	is the branch logic that provides decision-making capabilities in the					
	<b>A.</b> Unconditional transfer	в.	Controlled transfer			
	<b>C.</b> Conditional transfer	D.	None of these			
19	Which of the following is a procedure for acquiring the necessary locks for a transaction where all necessary locks are acquired before any are released?					
	<b>A.</b> Record controller	В.	Exclusive lock			
	<b>C.</b> Authorization rule	D.	Two phase lock			
20	BCNF is not used for cases where a rel	lation	has			
	A. Two (or more) candidate keys	В.	Two candidate keys and composite			
2.1	<b>C.</b> The candidate key overlap	<b>D.</b>	Two mutually exclusive foreign keys			
21	Relations produced from E - R Model v	vill al	ways be in			
	<b>A.</b> 1 NF	В.	2 NF			
	<b>C.</b> 3 NF	D.	4 NF			
22	If the attribute of relation schema R is type of attributes are classified as	mem	ber of some candidate key then this			
	<ul> <li>atomic attribute</li> <li>acometing attribute</li> </ul>	<u></u> . Ъ				
02	C. nonprime attribute	ש.	prime attribute			
23	Set of possible data values is called	Р	dograa			
		ם. ח	domain			
24	Functional Dependencies are the types	<b>لر</b> a of cr	netraints that are based on			
	rememorial dependencies are the types of constraints that are based on					

		17	P	TZ			
	A.	Key	В.	Key revisited			
<b>0-</b>	<b>C</b> .	Superset key	<b>D</b> .	None of the mentioned			
25	Th	The value of n if Turing machine is defined using n-tuples:					
	А.	5	В.	7			
	С.	8	D.	9			
26	Fir	Finite state machine can recognize					
	А.	any grammar	В.	only context-free grammar			
	С.	Both (a) and (b)	D.	only regular grammar			
27	On	One of the following Regular Expressions is not the same as others. Which one?					
	А.	(a* + b*a*)*	В.	(a*b* + b*a*)* (a*b*)*			
	С.	((ab)* + a*)*	D.	(a + b)* a*b*a*b*			
28	Let stat	Let the string be defined over symbols a and b then what will be the number states in minimal DFA, if every string starts and ends with different symbols					
	А. О	5	D. П	4			
20	C.	3	<b>D</b> .	2			
29	Wr	hat is the transition function of a D	ΓA _				
	А.	$Q \ge Q$	В.	$Q \ge 2Q$			
	С.	$Q \ge 2n$	D.	$Q \ge Qn$			
30	Let Wh tha	Let w be any string of length n is $\{0,1\}^*$ . Let L be the set of all substrings of w. What is the minimum number of states in a non-deterministic finite automaton that accepts L?					
	А.	n-1	В.	n			
	С.	n+1	D.	2n-1			
		PART	В				
		(Answer all questions. Each o	luesti	ion carries 2 marks)			
31	Wł	What would be the worst case time complexity of the insertion sort algorithm, if					
	the	inputs are restricted to permutatio	n of 1	n with at most n inversion?			
	Α.	θ (n1.5)	В.	θ (nlogn)			
	С.	θ (n)	D.	θ (n^2)			
32	Co	nsider the following graph.					
	A						

Apply breadth first search traversal of the above graph. Which of the following traversal is possible if start vertex is G? (Assume lexicographic ordering)

A.GAHJIBCEKDB.GAHJIBCDEK

J

**GAHIJBDEKC** 

None of the mentioned

**D.** GAHIJBCEKD

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 frames is increased to 4, then the number of page transfers

- A.IncreasesB.Remains the same
  - **D.** Decreases
- For 3-page frames, the following is the reference string: 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

How many page faults does the LRU page replacement algorithm produce?

- **A.** 12 **B.** 10
- **C.** 11 **D.** 14

34

33

С.

**C**.

35	In a 4M-bit chip organisation has a total of 19 external connections, then it has address if 8 data lines are there.						
	А.	2	В.	5			
	С.	9	D.	8			
36	In a war inst	In a six-stage pipeline assuming that there are no branch instructions. If we want to execute 15 instructions. What is the time required to execute these instructions?					
	А.	16	В.	12			
	С.	21	D.	20			
37	Wh	nich will be best query for deleting row from the table					
	А.	DELETE FROM TABLE _NAME WHERE CUSTOMER-STATE=" ";	В.	DELETE WHERE CUSTOMER- STATE=" ";			
	С.	DELETE TABLE _NAME WHERE CUSTOMER-STATE=" ";	D.	DELETE FROM CUSTOMER WHERE CUSTOMER-=" ";			
38	The main task carried out in the is to remove repeating attributes to separate tables.						
	А.	First Normal Form	в.	Second Normal Form			
	С.	Third Normal Form	D.	Forth Normal Form			
39	Which of the following language cannot be accepted by a regular expression?						
	А.	Language of a set of numbers divisible by 4	в.	Language of a set of binary complement			
	С.	Language of a set of 0n1n	D.	Language of a set of string with odd number of 0			
40	If we want to describe the complement of a language, then it is very important to						
	des	cribe the of that langu	age o	wer which the language is defined.			
	А.	Regular Expression	в.	String			

C. Word D. Alphabet