### DATA STRUCTURES WITH C (SEMESTER - 2)

### **CS/MCA/SEM-2/MCA-203/09**

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	Signature of Invigilator					7 1,000	4,10	2100		
2.		No.								
	Roll No. of the Candidate									

CS/MCA/SEM-2/MCA-203/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2009 DATA STRUCTURES WITH C (SEMESTER - 2)

Time: 3 Hours [ Full Marks: 70

#### **INSTRUCTIONS TO THE CANDIDATES:**

- 1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
- 2. a) In **Group A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
  - b) For **Groups B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group B** are Short answer type. Questions of **Group C** are Long answer type. Write on both sides of the paper.
- 3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
- 4. Read the instructions given inside carefully before answering.
- 5. You should not forget to write the corresponding question numbers while answering.
- 6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
- 7. Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.
- 8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
- 9. Rough work, if necessary is to be done in this booklet only and cross it through.

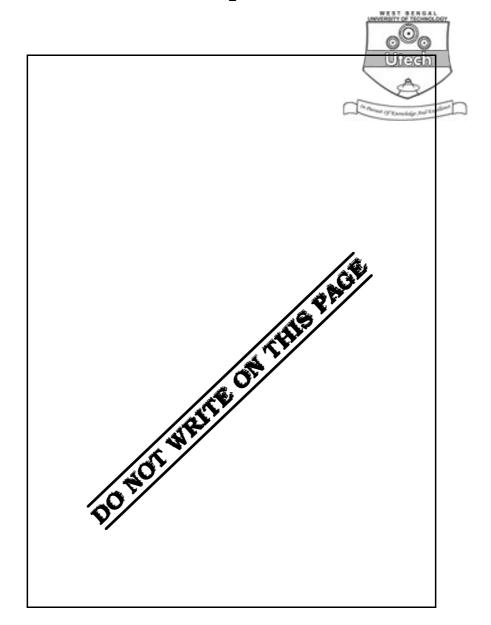
No additional sheets are to be used and no loose paper will be provided

# FOR OFFICE USE / EVALUATION ONLY Marks Obtained Group - A Group - B Group - C Question Number Marks Obtained Obtained

Head-Examiner/Co-Ordinator/Scrutineer

**2286** ( 09/06 )







# ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE 2009 DATA STRUCTURES WITH C

**SEMESTER - 2** 

Time: 3 Hours]	[ Full Marks : 7	70
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### **GROUP - A**

			( Multiple Choice 7	Гуре இ	uestions )	
1.	Choo	ose the	:	10 × 1 = 10		
	i)	Wors	t algorithm is			
		a)	O( Nlog <sub>2</sub> N )	b)	O( NlnN )	
		c)	O( n <sup>2</sup> )	d)	O( n <sup>3</sup> ).	
	ii)	Pick	out the invalid statement from	the foll	owing:	
		Que	ue can be used			
		a)	in the printer	b)	to access to disk storage	
		c)	for function call	d)	none of these.	
	iii)	In lii				
		a)	t			
		b)	is not necessarily equivalent to	their	physical arrangement	
		c)	is determined by their physica	l arran	gement	
		d)	none of these.			



10)	THE	method of comploir processing	require	s prime area and overnow area	1 01					
	a)	linked collision processing		Utech						
	b)	linear collision processing		To Spanning (IN Exemple for State Experient)						
	c)	quadratic collision processing	,							
	d)	none of these.								
v)	Which is not representation of a graph?									
	a)	Adjacency matrix	b)	Edge list						
	c)	Adjacency list	d)	All represents a graph.						
vi)	Which of the following is not a required feature of a good hashing algorithm?									
	It should									
	a)	be repeatable								
	b)	allow even distribution of records throughout the allocated space								
	c)	minimize synonyms								
	d)	none of these.								
vii)	A is an array of size $m*n$ , stored in the row major order. If the address of the									
	first element in the array is $M$ , the address of the element $A$ ( $i,j$ ) ( $A$ ( $0,0$ ) ) is									
	the first element of the array and each element occupies one location in memory									
	that	is								
	a)	$M + (i - j)^* m + j - 1$	b)	$M + i^* m + j$						
	c)	$M + (j-1)^* m + i - 1$	d)	$M + (i-1)^* n + j - 1.$						



	viii)		rence count may be maintained urpose of	for me	emory locations used in linked list for		
		a)	Copying	b)	Compaction		
		c)	Reclamation	d)	Traversal.		
	ix)	The r	naximum number of nodes in a	binary	tree of depth 5 is		
		a)	31	b)	16		
		c)	32	d)	15.		
	x)		hich collision processing metho	od, it i	is not required to detect a given list		
		a)	Quadratic	b)	Linked		
		c)	Rehashing	d)	None of these.		
			GROUP	- <b>B</b>			
			( Short Answer Ty	pe Qu	estions)		
			Answer any three of	of the f	following. $3 \times 5 = 15$		
2.	Is cir	cular	queue a non-linear data structu	re ? Jı	ustify your answer.		
3.	Name some non-linear data structures. Critically compare linear and non-linear data structures. $1+4$						
4.	Write a $\mathcal{C}$ function to reverse a linked list physically. ( That is change the node positions.)						
5.	Write clearl	_	oush() and pop() functions for	a stac	ck after describing the Data-Structure		
6.	What in has		shing ? Why is it used ? Explain	n the c	chaining method of collision resolution		



## GROUP - C

### (Long Answer Type Questions)

Answer any *three* of the following.

 $3 \times 15 = 45$ 

7. a) Define B-tree. Construct one B-tree of order 3 with the following data :

50, 40, 60, 30, 70, 20, 80, 10, 90, 9, 99.

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b) Construct a binary Tree from the following information :

In order: 50, 10, 30, 90, 60, 80, 40, 20, 70

Preorder: 60, 10, 50, 90, 30, 40, 80, 70, 20.

7

- 8. a) Explain AVL tree. Discuss how to insert an element in an AVL tree (Explain all cases).
  - b) Write an algorithm for deletion of an element from BST. (Include all the cases ).

7

- 9. Explain Heap. What is priority queue ? How will you implement a priority queue using Heap ? Explain with suitable example. 4 + 3 + 8
- 10. a) In how many ways, can you represent a graph in a computer memory? Which one is advantageous and why?
  - b) Write down the DFS algorithm.

6

- c) How is random access file different from indexed sequential file? What is Garbage collection?
- 11. a) Explain Polish and Reverse polish notations.

5

b) Convert the following:

5 + 5

- i)  $A + (((B-C)^*(D-E) + F)/G) + (H-I)$  [POSTFIX]
- ii) ABC / DEF + \* +

[ PREFIX ].

**END**