|--|

OK	111.	link list.
Q.6		Attempt any two:
	i.	What is DFS and BFS graph traversal scheme? Explain it with an example.
	ii.	Implement the concept of Quick Sort step by step on the following data:
		42 23 74 11 65 58 94 36 99 87
	iii.	Write a program which implement binary search algorithm.

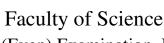
Total No. of Questions: 6

5

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Total No. of Printed Pages:4



End Sem (Even) Examination May-2018 CA3CO07 Data Structure

Programme: BCA

Branch/Specialisation: Computer Application

Enrollment No.....

Duration: 3 Hrs. Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Which of the following statement is false? Q.1 i.
 - (a) Arrays are dense lists and static data structure
 - (b) Data elements in linked list need not be stored in adjacent space in memory
 - (c) Pointers store the next data element of a list
 - (d) Linked lists are collection of the nodes that contain information part and next pointer
 - Worst case of an algorithm is represented by:
 - (a) Sigma notation

(b) Polish notation

(c) Big oh notation

- (d) Omega notation
- Given the base address of an array B[3300, 3400, 3500,4100] as 1 1020 and size of each element is 2 bytes in the memory. Find the address of B[3700]
 - (a) 1828
- (b) 1770
- (c) 1880
- (d) None of these

Predict the output of the following code

```
int main()
int a[][] = \{\{1,2\},\{3,4\}\};
   int i, j;
   for (i = 0; i < 2; i++)
     for (j = 0; j < 2; j++)
        printf("%d ", a[i][j]);
   return 0;
```

P.T.O

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[3]

	(a) 1 2 3 4				
	(b) Compiler Error in line "int a[][] = {	11 21 13 411·"			
	(c) 4 garbage values				
	(d) 4 3 2 1				
7.	Convert the infix expressions into its eq	uivalent nostfix expressions	1		
•	$(A + B ^D)/(E - F)+G$	divalent postiix expressions	•		
	(a) (A B D $^+$ E F - / G +) (b)) (A B D +^ E F - / G +)			
		None of these			
⁄i.	A queue of characters currently contain		1		
/1.	be the contents of queue after the follo		1		
	W, ADD X, DELETE, ADD Y	wing operation DELETE, ADD			
) C,D,W,X,Y			
) A,B,C,D,W			
⁄ii.	Consider the following definition in c pr		1		
111.	struct node	rogramming language	1		
	{				
	int data;				
	struct node * next;				
	}				
	typedef struct node NODE;				
	NODE *ptr;				
	Which of the following c code is used to	o create new node?			
	(a) ptr = (NODE*)malloc(sizeof(NODE				
	(b) ptr = (NODE*)malloc(NODE);	()),			
	(c) ptr = (NODE*)malloc(sizeof(NODE	*)):			
	(d) ptr = (NODE)malloc(sizeof(NODE)				
iii.	Why we need to a binary tree which is h		1		
1111,	(a) To avoid formation of skew trees (b)	-	-		
	(c) To attain faster memory access (d)	-			
х.	What is a hash table?	, 10 simping storing	1		
Λ.	(a) A structure that maps values to keys		-		
	(b) A structure that maps keys to values				
	(c) A structure used for storage				
	(d) A structure used to implement stack	and queue			
(d) A structure used to implement stack and queue					

	х.	A person wants to visit some places. He starts from a verte wants to visit every vertex till it finishes from one vertex, and then explore other vertex from same vertex. What als should use?	backtracks	I
		(a) Depth First Search (b) Breadth First Search		
		(c) Prim's algorithm (d) None of these		
Q.2	i.	Elaborate all Data Structure Operation.	2	2
	ii.	What do you mean by algorithm complexity? Define space complexity.	e and time	3
	iii.	What do you mean by Data Structure? Define all its type in D	etail.	5
OR	iv.	Describe Asymptotic Notations. Also Explain BigOh, Omega Notations.	and Theta	5
Q.3	i.	Define character string. Write its operations.		2
	ii.	Describe Multidimensional Array with an example?	3	3
	iii.	Write a Program to input an array, Stores the Squares of thes in an array and print it Using C.	e elements	5
OR	iv.	Write a Program to find Sum of Digit using recursion.		5
Q.4	i.	Convert Following Expression into Prefix and Postfix Expres $a+(b+c*(d+e))+f/g$	sion 3	3
	ii.	Write a Program for the implementation of push, pop operations on stack.	and peek	7
OR	iii.	Implement Circular Queue with operations enqueue, de traverse using C?	queue and	7
Q.5	i.	Define AVL Tree and B-tree with example.	4	4
	ii.	Draw Tree step by step based on below traversal order		6
		(a) Preorder 10 5 4 1 8 30 40		
		Inorder 1 4 5 8 10 30 40		
		(b) Preorder: L,K,A,J,B,C,I,H,E,D,F,G		
		Postorder: A,B,C,J,K,I,D,E,F,G,H,L.	D.T. 0	
			рто	١

Marking Scheme CA3CO07 Data Structure

Q.1	i.	Which of the following statement is false?	1
		(c) Pointers store the next data element of a list	
	ii.	Worst case of an algorithm is represented by:	1
		(c) Big oh notation	
	iii.	Given the base address of an array B[33004100] as 1020 and size of each element is 2 bytes in the memory. Find the address of B[3700] (d) None of these	1
	iv.	Predict the output of the following code	1
		int main()	
		{	
		int $a[][] = \{\{1,2\},\{3,4\}\};$	
		int i, j;	
		for $(i = 0; i < 2; i++)$	
		for $(j = 0; j < 2; j++)$	
		printf("%d ", a[i][j]);	
		return 0;	
		}	
		(b) Compiler Error in line "int a[][] = $\{\{1,2\},\{3,4\}\}$;"	
	v.	Convert the infix expressions into its equivalent postfix expressions	1
		$(A + B \land (D)/(E - F) + G$	
		(a) $(A B D + E F - / G +)$	
	vi.	A queue of characters currently contained a,b,c,d. What would be the contents of queue after the following operation DELETE, ADD W, ADD X, DELETE, ADD Y (b) C,D,W,X,Y	1
	vii.	Consider the following definition in c programming language	1
		struct node	
		{	
		int data;	
		struct node * next;	
		}	
		typedef struct node NODE;	
		NODE *ptr;	

		Which of the following c code is used to create new	node?					
		(a) ptr = (NODE*)malloc(sizeof(NODE));						
	viii.	Why we need to a binary tree which is height balance	ced?	1				
		(a) To avoid formation of skew trees						
	ix.	What is a hash table?		1				
		(b) A structure that maps keys to values						
	х.	A person wants to visit some places. He starts from		1				
		wants to visit every vertex till it finishes from one v						
		and then explore other vertex from same vertex. Wh	nat algorithm he					
		should use?						
		(a) Depth First Search						
Q.2	i.	Elaborate Data Structure Operation.		2				
		For Each operation 0.5	(0.5 mark * 4)					
	ii.	Explain Algorithm Complexity with its type?		3				
		Definition	1mark					
		Time Complexity	1 mark					
		Space Complexity	1 mark					
	iii.	What Do you Mean by Data Structure? Define all it	s type in Detail.	5				
		Data Structure Definition	1 mark					
		Primitive	2 marks					
		Non Primitive	2 marks					
OR	iv. Describe Asymptotic Notations. Also Explain BigOh,Omega and							
		Theta Notations.						
		Asymptotic Notations	2 marks					
		BigOh Notation	1 mark					
		Omega Notation	1 mark					
		Theta Notation	1 mark					
Q.3	i.	Define character string. Write its operations.		2				
		Definition	1 mark					
		Operation	1 mark					
	ii.	Describe Multidimensional Array with an example?	•	3				
		Definition	2 marks					
		Example	1 mark					

	iii.	Write a Program to input an array, Stores the Squares of the elements in an array and print it Using C.	nese	5	OR	iii.	Write algorithm for insertion circular link list.
		Declaration	1 mark				Single Link List
		Logic	3 marks				(Insertion 1.5 marks +Deletion
		Output	1 mark				Circular Link List
OR	iv.	Write a Program to find Sum of Digit using recursion.	1 mark	5			(Insertion 1.5 marks +Deletion
OK	1 7 .	Declaration	1 mark	5			(HISCITION 1.5 Marks Deletion
		Logic	3 marks		Q.6		Attempt any two:
		Output	1 mark		۷.۰	i.	What is DFS and BFS graph
		Output	1 IIIaik			1.	example.
Q.4	i.	Convert Following Infix Expression into Prefix and Postfi	X	3			Description DFS
		Expression					Example
		a+(b+c*(d+e))+f/g					Description BFS
		Infix Expression into Prefix	1.5 mark				Example
		Infix Expression into Postfix	1.5 mark			ii.	Implement the concept of Qu
	ii.	Write a Program for implementation of Stack operations?		7			data:
		Declaration	1 mark				42 23 74 11 65 58
		Push	2 marks				0.5 marks for each correct ste
		Pop	2 marks			iii.	Write a program which imple
		Peep	2 marks				Initialization
OR	iii.	Implement Circular Queue with all its operation using C?		7			Logic
		Declaration	1 mark				Output
		Insertion	2 marks				
		Deletion	2 marks				*
		Traversing	2 marks				
Q.5	i.	Define AVL Tree and B-tree with example.		4			
		AVL Tree	1.5 mark				
		Example	0.5 mark				
		B-Tree	1.5 mark				
		Example	0.5 mark				
	ii.	Draw Tree step by step based on below traversal order		6			
		(a) Preorder 10 5 4 1 8 30 40	3 marks				
		Inorder 1 4 5 8 10 30 40					
		(b) Preorder: L,K,A,J,B,C,I,H,E,D,F,G	3 marks				
		Postorder: A,B,C,J,K,I,D,E,F,G,H,L.					

OR	111.	Write algorithm for insertion and deletion in single link list and circular link list.	6
		Single Link List 3 marks	
		(Insertion 1.5 marks +Deletion 1.5 marks)	
		Circular Link List 3 marks	
		(Insertion 1.5 marks +Deletion 1.5 marks)	
Q.6		Attempt any two:	
	i.	What is DFS and BFS graph traversal scheme? Explain it with an	5
		example.	
		Description DFS 2 marks	
		Example 0.5 mark	
		Description BFS 2 marks	
		Example 0.5 marks	
	ii.	Implement the concept of Quick Sort step by step on the following	5
		data:	
		42 23 74 11 65 58 94 36 99 87	
		0.5 marks for each correct steps (0.5 mark * 10)	
	iii.	Write a program which implement binary search algorithm.	5
		Initialization 1.5 mark	
		Logic 3 marks	
		Output 0.5 mark	
