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06CS35

Third Semester B.E. Degree Examination, Dec 08 / Jan 09
Data Structures with C

Time: 3 hrs. Max. Marks:100

Note : ***Answer any FIVE full questions, selecting at least TWO from each part.***

PART – A

1 a. Write the output for the following program **(04 Marks)**

```
# include < stdio.h >
void main ( )
{
    int a = 7, b = 8 ; * p, * q ;
    p = & a
    q = & b
    print f (" 1n % d", ++a) ;
    print f (" 1n % d", ++(*p)) ;
    print f (" 1n % d", --(*q)) ;
    print f (" 1n % d", --b) ;
}
```

b. What would be printed form the following block, explain. **(08 Marks)**

```
Void main ( )
{
  int num [5] = {3, 4, 6, 2, 1};
  int * p = num;
  int * q = num + 2 ;
  int * r = snum [1] ;
  print f ("1n% d % d", num [2], * (num + 2));
  print f ("1n% d % d", * p, *(p + 1));
  print f ("1n% d % d", * q, * (q + 1));
  print f ("1n% d % d", * r , * (r + 1));
}
```

c. What do you understand by Dynamic Memory Allocation? Explain any three function that support dynamic memory allocation. **(08 Marks)**

2 a. Write a function newstrcpy and newstrcat that does the same job as strcat and strcpy without using library function. **(06 Marks)**

b. Explain the following function with suitable examples. i) fseek ( ) ii) rewind ( ) iii) ftell ( ). **(06 Marks)**

c. List the differences between union and structures. Write a structure student with id, name and marks 1, marks 2, marks 3. Write functions
read _ data ( ) to read 5 students data and
print_data ( ) to display the student details. **(08 Marks)**

3 a. Transfer each of the following infix expression to its postfix form
i) (A + B) * (C & (D – E) + F) – G ii) (A + B) * (C - D) & E * F. **(06 Marks)**
iii) A + (((B – C) * (D – E) + F) / G) & (H – J).

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b. Show the detailed contents of stack for a given postfix expression 623 + - 382/ + * 2 & 3 + and evaluate the expression. **(08 Marks)**

c. Write a 'C' function to check whether a string is palindrome to not using stack. **(06 Marks)**

4 a. What is Recursion? Write a recursive function for Binary search. **(06 Marks)**

b. What is Priority Queue? Explain about different types of priority queues. **(05 Marks)**

c. Write a C program to simulate the working of circular queue of integers using array. Provide the following operations. i) Insert ii) Delete iii) Display. **(09 Marks)**

PART – B

5 a. Explain how the linked list can be represented using arrays. **(04 Marks)**

b. Write a C function to merge two ordered linked list. **(06 Marks)**

c. Write a C program to perform the operation on stack using singly linked list. **(10 Marks)**

6 a. Explain the following : i) Circular list ii) Doubly linked list. Using suitable diagrams. **(06 Marks)**

b. Write a C routine to perform following operations using circular linked list.
i) To place the elements of a list in increasing order.
ii) To find the sum of integers and the number of elements in a list. **(10 Marks)**

c. What are the advantages and disadvantages of representing group of item as an array versus a linear linked list? **(04 Marks)**

7 a. Write a expression tree for the following postfix expression. ab + cd - * ef + /. **(06 Marks)**

b. Write inorder, preorder and postorder traversals for the following tree (ref. Fig.7(b)) **(06 Marks)**

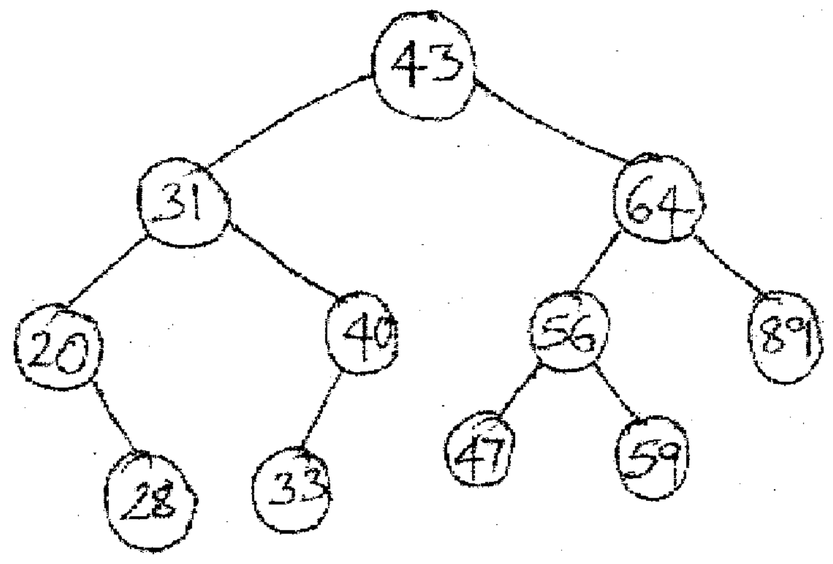

Fig.7(b)

c. Explain array representation of binary tree and write a function to search a given element in a Binary search tree using array representation. **(08 Marks)**

8 a. Write a function to : i) Find the maximum element in the Binary search tree. ii) To search an element in the tree. **(08 Marks)**

b. Explain the following : i) Binary search tree ii) Threaded binary tree iii) Strictly binary tree iv) Almost complete binary tree. **(08 Marks)**

c. Write a C routine to count the numbers of nodes in a Binary search tree. **(04 Marks)**

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