MSE (SEM-III)

KOLHAPUR INSTITUTE OF TECHNOLOGY'S,
COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR
(AFFILIATED TO SHIVAJI UNIVERSITY, KOLHAPUR)

Second Year B.Tech. (Computer Science & Engineering)

MID SEMESTER EXAMINATION, SEPTEMBER 2018

DATA STRUCTURES (UCSE0303)

Day and Date: Monday, 24/09/2018
Time: 09:30 AM to 11:30 AM

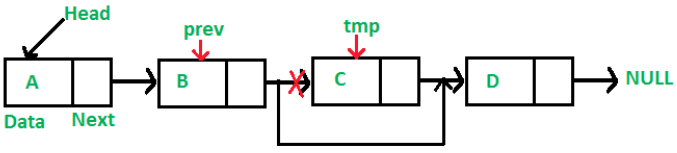
PRN No. :

Max Marks 50

Instructions:

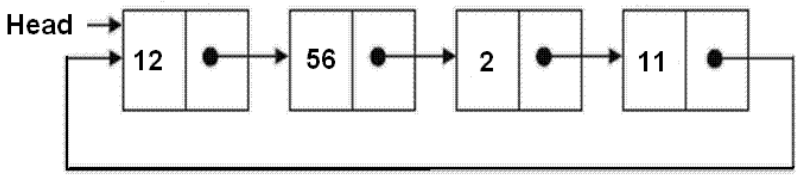
IMP: Verify that you have received question paper with correct course, code, branch etc.

i) All questions are compulsory.
ii) Figure to the right indicates full marks.
iii) Assume suitable data wherever necessary.

		Marks	CO's	Bloom's Level	PO Level
Q.1	**Attempt the following:**	**18**			
A	i. Write a C function for POP(S) where S is a pointer to a stack structure.	**3**	**CO1**	**1**	
	ii. Consider a stack with an additional operation (which is based on POP(S)), MULTIPOP(S,k) which removes the k top objects of stack S.	**3**	**CO4**	**3**	
B	i. Write a C function for enque(Q, k) operation of queue data structure, where Q is a pointer to a queue structure and k is an integer to be inserted.	**3**	**CO1**	**1**	
	ii. Now, write another C function enque_priority(Q,k) based on the above function which will add the integer k into the queue in such a way that when the queue is printed from head to tail position, all integers get printed in a sorted order.(Note that now the enqueue operation is free to add the integer at any position)	**3**	**CO4**	**3**	
C	i. 	**3**	**CO1**	**2**	

What is the operation depicted in the figure? Explain.

ii. **3** **CO1, CO4** **3**



This data structure is called circular linked list. Now, write a C function ***visit_list(struct node * Head)*** without using extra pointer variable to print all the integer values. (You are free to use an integer type variable and to move the ***Head*** pointer. Also assume all integers in the list are distinct)

Q.2 A **Attempt any two** **16**

i. What is value assigned to x in the following C programs: **4** **CO3** **4**

a)
```
#include <stdio.h>
void main()
{
   int x = 5 - 9 * 3 + 9;
}
```

Justify your answer.

b)
```
#include <stdio.h>
void main()
{
   int x = 5 - 9 / 3 * 9;
}
```

Justify your answer.

ii. Following is the C code written to compare two strings with some logical error in it: **4** **CO3** **3**

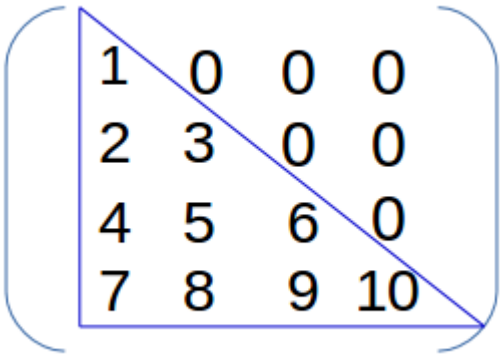
```
int string_compare(char str1[], char str2[])
{
   int ctr=0;

   while(str1[ctr]==str2[ctr])
   {
      if( str1[ctr]=='\0' || str2[ctr]== '\0' )
         break;
      ctr++;
   }
   if(str1[ctr]=='\0')
      return 1;
   else
      return 0;
}
```

Correct the error and rewrite the code.

B	i. Write a C program to print square of 1 to 100 integers using a while loop.	**4**	**CO4**	**1**
	ii. In C language arrays are passed by address. Explain the statement with an example.	**4**	**CO1**	**2**
C				

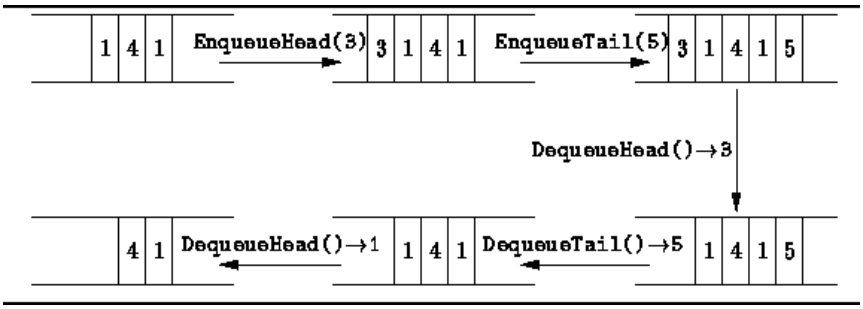
	i. Consider the following C code:
	#include<stdio.h>
	int main()
	{
	int i;
	for (i=10, i>0; i--) printf(" \n %d", i);
	}
	There is an error in the code. Is the error logical or syntax related? Justify your answer.
		4	**CO3**	**3**

	ii. Write a C program to find sum of all elements in a lower triangular matrix of size n:	**4**	**CO4**	**3**



Q.3	**Attempt the following:**	**16**		
A				
	i. Which data structure is most suitable in each of the following cases: A. To check matching parentheses B. Printing multiple documents on a printer C. Representing polynomial equations D. To perform undo operations in a document editor	**4**	**CO2**	**3**
		4	**CO1**	**3**

ii.



A data structure shown above shares properties of both, stack and queue. Explain the properties of the data structure.

B

i. What is meant by Abstract Data Type? Explain with example. **4** **CO1** **1**

ii.

#include<stdio.h> **4** **CO3** **2**

```
int main()
{
        int n,sum=0,c,value,n=10;


        printf("Enter %d integers\n\n",n);
        for(c = 1; c <= n; c++)
        {
        scanf("%d", &value);

        sum += value;
        }
}
```

What does this code compute?

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