PES University, Bangalore
UE15CS151
(Established under Karnataka Act No. 16 of 2013)

END SEMESTER ASSESSMENT (ESA) B. Tech 2nd SEMESTER
Summer - July 2016

UE15CS151 Problem Solving with C

Answer All Questions

Time: 03 Hrs.
Marks: 100.

Max

1	a	Mention various data types available in C language along with an example.	04
	b	What is the output of the following programs?	3*2=6

i)
```c
#include <stdio.h>
int main()
{
   int x = 2;
   int arr[] = {1, 2, 3};
   switch (x)
   {
      case arr[0]: printf("Choice 1\n");
      case arr[1]: printf("Choice 2\n");
      case arr[2]: printf("Choice 3\n");
   }
   return 0;
}
```

ii)
```c
int main()
{
  int i = 0;
  for(i = 0; i < 3; i++)
  {
    printf("loop ");
    break;
  }
  return 0;
}
```

iii)
```c
int main()
{
  int i = 0;
  while(i < 3)
  {
    printf("loop");
    continue;
    i++;
  }
  return 0;
}
```

	c	Explain different storage classes available for variables in C.	10
2	a	Write pointer expressions for the following:-	2*2=4
		i) Pointer variable holding the reference of integer type of data, points to the same integral variable throughout the program.	

		ii) Character pointer can point to any character during the execution of the program but it cannot modify the character data.		
	b	List out the advantages & disadvantages of using pointers.	2+2=4	
	c	Declare & initialize the following using appropriate C statement.	3*2=6	
		i) Declare a string variable of length 20 bytes to accommodate the name of a person with maximum of 20 letters.		
		ii) Partially initialize an integer array with 10 elements.		
		iii) Initialize a character of size 5 by 4 characters individually.	2*3=6	
	d	Write one line C code to perform the following:-		
		i) Function prototype with string as a first argument followed by variable number of arguments and returns no value.		
		ii) Function header with generic pointer as a return value & the parameter list contains character as 1st argument, function pointer (with integer return type & single integer argument) as 2nd argument.		
3	a	What is the implicit return type of a function in C & why?	04	
	b	Which is the 1st parameter received by the main() function every time it is called from the command line? Why?	04	
	c	Consider the following structure declaration. What is the output? Justify your answer.	04	

```
struct Student
{
    int rollno;
    float marks;
    char name[10];
};
struct Student S;
int main()
{        printf("Size of the Student structure variable S is %d\n",sizeof(S));        }
```

	d	Structure values can be passed as arguments to functions. List various mechanisms to achieve this in C language? Give an example for each.	08	
4	a	Enumerate 3 valid differences between Structures & Unions with examples.	3*2=6	
	b	Provide the syntax of 3 dynamic memory allocation functions.	3*2=6	
	c	Explain memory leak with an example. Discuss the problems associated with this & solutions for the same.	4+2+2	
5	a	Write a note on C pre-processors.	04	
	b	Why enumeration is used in C language? Write the syntax & example for the same.	2+2+2	
	c	List & explain various bitwise operators available in C with an example to each.	10	