COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Govt. of Maharashtra)

End Semester Examination

(CT- 101) Fundamentals of Computer Programming

Class: - F.Y. B.Tech (Division VI to X)

Year: - 2013-14   Semester: - I

Duration: - 3 Hrs.   Max. Marks: - 60

Instructions:

1. *All the Questions are compulsory.*
2. *Every answer should be written completely once only else marks will not be awarded for that question.*
3. *Solve all parts of same question together.*

Q.1	Solve the following.		

A.	Write a C program for the following pattern?
	     1 1
	    12 21
	   123 321
	  1234 4321
	 1234554321
			[4]

B.	**(i) Find output.**
	 `#include<stdio.h>`
	
	 `int main() {`
	 `int x,y,z;`
	 `x=10;`
	 `z=y=x;`
	 `y-= x--;`
	 `z-= --x;`
	 `x-= --x - x--;`
	 `printf("%d",x);`
	 `return 0;   }`
		(ii) Find output.
		 `#include<stdio.h>`
		 `int main()   {`
		 `int x = 10, y = 20, z = 5, i;`
		 `i = x < y < z;`
		 `printf("%d\n", i);`
		 `return 0;  }`
			[2]

	(iii) Find output.
	 `#include<stdio.h>`
	 `int main() {`
	 `  int i;`
	 `  printf("%c",7["computer"]);`
	 `  return 0;   }`
		(iv) Find output.
		 `#include<stdio.h>`
		 `#define CUBE(X) X*X*X`
		 `main() {`
		 `int i;`
		 `i=64/CUBE(4);`
		 `printf("%d",i);   }`	

C.	**(i) Find output.**
	 `#include<stdio.h>`
	 `int main() {`
	 `  float a=0.7;`
	 `  printf("%.10f , %.10f\n",0.7, a);`
	 `  return 0; }`
		(ii) Find output.
		 `#include<stdio.h>`
		 `int main() {`
		 `   printf("%x", -1>>1);`
		 `   return 0;  }`
			[6]

	(iii) Find output.
	``c
	#include<stdio.h>
	int main() {
	   int a=0, b=1, c=3;
	   *((a) ? &b : &a) = a ? b : c;
	   printf("%d", a);
	   return 0; }
	``
		(iv) Find output.
		``c
		#include<stdio.h>
		int main() {
		int s=1;
		while(s++<10)
		{if(s<2&&s<9)
		continue;
		printf("%d\t",s);}
		return 0; }
		``	

	(v) Find output.
	``c
	#include<stdio.h>
	int r();
	int main() {
	 for(r();r();r()) {
	  printf("%d ",r()); }
	return 0; }
	
	int r() {
	 int static num=7;
	 return num--; }
	``
		(vi) Find output.
		``c
		#include<stdio.h>
		int main() {
		   int i;
		   for(i=10;i<=15;i++) {
		      while(i) {
		         do {
		            printf("%d ",1);
		            if(i>>1)
		               continue;
		         } while(0);
		         break; } }
		   return 0; }
		``	

Q.2	Solve the following.		
A.	If you want a variable to retain its value even after the function completes its execution the function should be declared as a)auto b)extern c)static global d)static local	B. Array passed as an argument to a function is interpreted as a)Address of the array b)Values of the first elements of the array c)Address of the first element of the array d)Number of elements of the array	[2]
C.	What is array? How to declare and initialize two dimensional array?		[2]
D.	Write a program to find factorial of a number using recursion.		[2]

E.	Find the output of following program.
	``c
	#include<stdio.h>
	 main() {
	auto int i=10;
	register int j=20;
	printf("main i and j are %d %d \n",i,j);
	change();
	i+=10;
	j+=10;
	printf("main i and j are %d %d" ,i,j); }
	``
		``c
		change() {
		auto int i=100;
		register int j=200;
		i=i+j;
		j=j*2;
		printf("Change i and j are %d %d\n",i,j);
		}
		``
			[3]

F.	Find the output of following program.
	``c
	#include<stdio.h>
	 main() {
	char str[20]="welcome";
	int i=0;
	while(str[i]!='\0') {
	if(str[i]>='a'&& str[i]<='z')
	str[i]=str[i]-32;
	i++; }
	printf("String is %s",str); }
	``
		G. Explain the automatic and extern storage classes.	[1]
			+
			[2]

Q.3	Solve the following.		
A.	What do calloc() and malloc() functions do? Write their proper syntax and also the difference between the two.		[2.5]
B.	Write a function in C called create_int_space() which takes as argument the number of integers and returns an integer pointer. The function will dynamically allocate memory for the number of integers specified in the argument and return the pointer to the memory allocated. If memory is not allocated successfully, it will print an appropriate error message.		[2.5]
C.	What is a memory leak? What are problems encountered because of memory leaks?		[2]
D.	A program contains the following declaration: int x[8] = {10,20,30,40,50,60,70,80}; (a) What is the meaning of x? (b) What is the meaning of x+2? (c) What is the value of *x +2? (d) what is the value of *(x+2)?		[2]

E.	The skeletal structure of a C program to compute the average of a list of numbers is given. Complete the program using pointer notation and print the average of the numbers.
	
	``c
	#include<stdio.h>
	main() {
	int a[10] = {10,20,30,40,50,60,70,80,90,100};
	int *ptr, avg,i;
	---------------- 	
	------------- }
	``
		F. Find the output of the following program:
		
		``c
		#include<stdio.h>
		void main() {
		float a[] = {13.24,24.56,78.90,2.9,6.09};
		float *j, *k;
		j = a;
		k = a+4;
		*j = *j/2;
		*k = *k/2;
		printf("\n%d\n%d",*j,*k); }
		``
			[2]
			+
			[1]

Q.4	Solve the following.		
A.	Define a structure called f_details having 2 members named no and name of type integer and character array of size 10 respectively.		[1]
B.	Define a structure called s_details having 3 members named basic, hra and da as integer type.		[1]
C.	Define a structure called all_details having 2 members named faculty of type struct f_details and salary of type struct s_details defined in (A) and (B) respectively.		[1]
D.	Declare a variable called info and info1 of type struct all_details.		[1]
E.	Write a function compare to check whether both varaibles info and info1 have same data. Two arguments to compare are of type struct all_details and compare will return 1 if both are same and 0 otherwise.		[3]

F.	Compare array and structure.	[2]

G.	Write output of following:
	
	``c
	#include<stdio.h>
	
	main() {
	
	struct city {int no; char *name;};
	
	struct city c[3] = {{1,"Pune"},{2,"Mumbai"},{3,"Delhi"}};
	
	struct city *ptr,*ptr1;
	
	printf("%d %s\n",c[0].no, c[0].name);
	
	ptr=c;
	
	for(ptr1=ptr+1; ptr1< c+3;ptr1++)
	
	printf("%d %s\n",ptr1->no, ptr1->name);
	
	}
	``
		[3]

Q.5	Solve the following.	

A.	Consider following structure and function prototype.
	``c
	struct num1
	{
	  int x;
	 struct num1 *next;
	}*header, *first, *rear;
	
	void add_at_location(struct *header, int location, int value);
	``
	ss
	 Write a function which will insert a node with value in a singly link list at specified location.
		[4]

B.	Draw a pictorial representation of singly link list and specify the possible operations that can be performed on link list.	[2]
C.	List the different modes of opening a file. State the differences in 'r' & 'r+', 'w' & 'w+'.	[2]
D.	Write a program that will copy contents of one file to another.	[4]