

Comp/25

**COLLEGE OF ENGINEERING, PUNE**  
**(An Autonomous Institute Of Government Of Maharashtra)**  
**F.Y.B.TECH (Semester II) 2012-13**  
**Fundamentals of Computer Programming**  
**End-Semester Examination**

**Total Marks: 50**

**Instructions: All questions are compulsory.**  
**Attempt all questions in given sequence.**

- Q.1) A) What will be output of following program? (2)
- a) 

```
main()
{ int arr[] = {10,20,30,40,50,60,70};
  int *i, *j;
  i= &arr[1];
  j=&arr[5];
  printf(“%d %d”,j-i,*j-*i);}
```
- b) List different operations which are cannot be performed on pointer variables. (1)
- c) Define a structure called link\_list which has two members: a member called data of type integer and another member called next which is a pointer to another structure of type link\_list. (1)
- d) Consider a structure given in Q.1) A) c) and complete the following function: (3)
- Functions prints the complete link\_list  
Input: Pointer to 1<sup>st</sup> node in link\_list  
Output: Void
- ```
void print(struct link_list *ptr)
{
  while(ptr->next != NULL)
  {
    _____
    _____
  }
}
```
- e) Consider a structure given in Q.1) A) c) and write a function called 'insert' to insert node in beginning of link\_list which is already created. (3)
- Input: Pointer to first node in link\_list.  
Output: Pointer to first node in link\_list after insertion of new node in link\_list.
- Q.2) A) a) Define a structure called point which has 2 members x and y of type float. (1)
- b) Define another structure called circle which has the following 2 members: (1)
- A member called center which is of type point as in Q.2) A) a) above.  
Another member called radius which is of type float.
- c) Now declare a variable mycircle which is of type circle as in Q.2) A) b) and write a statement in C programming language which will print the radius and the center of mycircle. (1)
- d) Now declare a pointer p to a variable of type circle as in Q.2) A) b) and write a statement in C programming which will print the radius and the center of that circle using this pointer p. (1)

- e) Define a self referential structure called graph containing the following 3 members:  
 A 40 element character array called name  
 A structure named vertex of type point as defined in part (a) above. (2)  
 A pointer to another structure of the type graph, called next

- B) a) Write the output of the following program:
- ```
#include<stdio.h>
typedef struct {
    char *a; char *b; char *c;
} colors;
void funct(colors sample);
main() {
    colors sample = {"red", "green", "blue"};
    printf("%s %s %s\n", sample.a, sample.b, sample.c);
    funct(sample);
    printf("%s %s %s\n", sample.a, sample.b, sample.c);
    void funct(colors sample) {
        sample.a = "cyan";
        sample.b = "magenta";
        sample.c = "yellow";
        printf("%s %s %s\n", sample.a, sample.b, sample.c);
        return;}
}
```
- (2)

- C) Write the output of the following program:
- ```
#include<stdio.h>
main() {
    struct s1 { char *z; int i; struct s1 *p; };
    struct s1 a[] = { {"Maths", 1, a+1}, {"Physics", 2, a+2}, {"Chemistry", 3, a} };
    struct s1 *ptr = a;
    printf("%s %s %s\n", a[0].z, ptr->z, a[2].p->z);
}
```
- (2)

- Q 3) A) Write a program to copy contents of a file in another file. (3)

- B) What will be the output of the following program if n=3 and p=4 ? What will be the result if we declare 'r' as 'auto' ?

```
#include<stdio.h>
int power1(int, int);
void main()
{
    int n, p, result;
    printf("Enter the number.");
    scanf("%d", &n);
    printf("Enter the power.");
    scanf("%d", &p);
    result=power1(n, p);
    printf("The result of %d to the power %d is %d\n", n, p, result);
}
int power1(int x, int y)
{
    static int r=1;
    if(y==0)
        return 1;
    else
    {
        r=r*x;
        power1(x, y-1);
    }
    return r;}

```

(2)

- C) Which are the differences in operations performed by the file modes?  
 a. r and r+      b. w and w+      c. a and a+ (3)
- D) Explain the following features of object oriented programming with example.  
 a. Object   b. Class   c. Inheritance   d. Polymorphism (2)

Q.4) A) a) What will be the output of the program assuming that the array begins at the location 1002 and size of an integer is 4 bytes?

```
#include<stdio.h>
int main(void)
{ int a[3][4] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 };
  printf("%u %u %u \n", a[0]+1, *(a[0]+1), (*(a+0)+1));
  return 0; }
```

 (2)

b) What is the output of following program?

```
#include <stdio.h>
int main (void)
{ char str [] = {'C', 'O', 'L', 'L', 'E', 'G', 'E', '\0'};
  abcd(str, 'E');
  printf("%s", str);
  return 0; }
```

 (2)

```
void abcd(char s[], int c)
{ int i, j;
  for (i = j = 0; s[i] != '\0'; i++)
    if (s[i] != c)
      s[j++] = s[i];
  s[j] = '\0'; }
```

c) Consider the following function:

```
void pqr(char s[], char t[])
{ int i, j;
  i = j = 0;
  while (s[i] != '\0')
    i++;
  while ((s[i++] = t[j++]) != '\0'); }
```

 (2)

Let the function be called with following character arrays:

```
char s[50] = "Fundamental";
char t[50] = "Programming";
```

What will be the contents of 's' array after the function execution?

d) Let 's' be a character array with initial value as "COMPUTER". What will be its contents if it is passed as input parameter to the function abcd given above?

```
void abcd(char s[])
{ int c, i, j;
  for (i = 0, j = strlen(s)-1; i < j; i++, j--) {
    c = s[i]; s[i] = s[j]; s[j] = c; } }
```

 (2)

e) The function test is coded as follows:

```
int test(int number)
{
  int m,n=0;
  while (number)
  { m = number % 10;
```

 (2)

```

if (m %2)
    n = n+1;
number = number /10;}
return (n); }

```

What will be the values of x and y when the following statements are executed

i) `int x = test(135);`      ii) `int y = test(246);`

Q.5) A) What will be output of the following program? (6)

|                                                                                                                                              |                                                                                                                                  |                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>a)</p> <pre> #include&lt;stdio.h&gt; int main(){     int i=1;     i=2+2*i++;     printf("%d",i);     return 0; } </pre>                   | <p>b)</p> <pre> #include&lt;stdio.h&gt; int main(){     int a=2,b=7,c=10;     c=a==b;     printf("%d",c);     return 0; } </pre> | <p>c)</p> <pre> #include&lt;stdio.h&gt; void main(){     int a=5,b=10;     clrscr();     if(a&lt;++a  b&lt;++b)         printf("%d %d",a,b);     else         printf("John Terry"); } </pre>                                                                                                            |
| <p>d)</p> <pre> #include&lt;stdio.h&gt; int main(){     int i;     for(i=0;i&lt;=5;i++){         printf("%d",i)     }     return 0; } </pre> | <p>e)</p> <pre> #include&lt;stdio.h&gt; int main(){     for(;;) {         printf("%d ",10);     }     return 0; } </pre>         | <p>f)</p> <pre> #include&lt;stdio.h&gt; int main(){     int i;     for(i=10;i&lt;=15;i++){         while(i){             do{                 printf("%d ",1);                 if(i&gt;1)                     continue;             }while(0);             break;         }     }     return 0; } </pre> |

B) State weather following statements true or false

- `5 > 10 || 10 < 20 && 3 < 5`
- `10 ! 15 && !(10 < 20 ) || 15 > 30`
- Associativity of `sizeof` operator is left to right
- The "default" case is necessary in SWITCH -CASE statement

C) Determine the value of the each of the following expressions if `a = 5` , `b = 10` and `c = -6`

- `R1 = b > 15 && c < 0 || a > 0`
- `R2 = ( a/2.0 == 0.0 && b/2.0 != 0.0 ) || c < 0.0`
- `R3 = (a == 5) ? (b != 10 ? (c*a) : (c*b)) : c*c`
- `R4 = (a = a + 5, b = b + 10, a + b + c)`