[This question paper contains 6 printed pages.]

B.Sc. (G) / I   **C**

COMPUTER SCIENCE – Paper I

(Programming Fundamentals and Data Structures)

(Admissions of 1999 and onwards)

Time : 3 hours   *Maximum Marks : 38*

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

All *questions are compulsory.
Parts of a question must be answered together.*

1. Give output that will be produced on execution of the
    following program :   (2 each)

    (a) # include <stdio.h>

    ```
    void main ( )
    {
        int i. j. k, x = 0;
        for (i=0; i<5; ++i)
        for (j=0; j<i; ++j)
        {
            switch (i+j-1)
            {
    ```

```
                        case  -1:
                        case   0:
                            x += 1:
                            break;
                        case  1:
                        case  2:
                        case  3:
                            x += 2:
                            break;
                        default:
                            x += 3:
                }
        printf("%d",x);
        }
        printf("\nx = %d".x);
    }

(b) #include <stdio.h>
    void main ( )
    {
        int a =0, b=1, count:
        int funct1(int a):
        int funct2(int a):
            for (count = 1; count <=5; ++count)
        {
            b+= funct1(a) + funct2 (b):
```

```
        printf("%d".b):
    }
}
int functl(int a)
{
    int b:
    int funct2(int a):
    b=funct2(a):
    return(b):
:
int funct2(int a)
{
    static int b = 1;
    b+=1;
    return (b+a):
}
```

(c) #include<stdio.h>

```
void main()
{
    int m. j=1, k=3;
    m=2*j + k;
    j=2 * m +j /3:
    k/=2:
    m=j+k+m:
    printf("\n j=%d\tk=%d\tm=%d\n",j,k,m);
}
```

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2. (a) Explain the use of exit() function with example.
(2)

(b) A C program contains the following declaration :

static int x[8] = {100, 200, 300, 400, 500, 600, 700, 800};

(i) What does (x+2) indicate ?

(ii) What is the value of *x ?

(iii) What is the value of (*x+2) ?

(iv) What is the value of *(x+2) ?   (4)

(c) What is the value displayed by the printf statement in the following code :   (2)

```
#include<stdio.h>
  void main()
  {
      char   a='X';
      char  b='Y';
      int j;
      int funct1(char *pa, char *pb);
      j=funct1(&a, &b);
      printf("a=%c   b=%c", a, b);
  }
```

```
int functl(char *p. char *q)
{
        *p = 'P':
        *q = 'Q':
        if(*p == *q)
             return(*p):
        else
             return(*q):
}
```

(d) Give the difference between break and continue with example. (2)

3. (a) Write a C function to concatenate two singly link lists. (3)

(b) Write the action of the functions getchar() and putchar(). Give examples. (2)

(c) Determine the value of the following expression:

$8/5 + 4\%2$ (2)

4. (a) Write a C function to calculate $y=x^n$. (3)

(b) What do you understand by recursion ? Write a recursive function to compute

$1 + 2 + 3 + \ldots + n$ (3)

(c) Define a structure to store information about employees consisting of the following data elements :

Data item	Type	Length
code	char	4
name	char	25
department	char	20
joining_date	date	---

where date is structure consisting of elements day, month and year of type int. Assume that there are not more than 100 employees.   (3)

5. (a) Transform the following expression to prefix and postfix :

(A+B) * (C–D) $ E * F   (3)

(b) Give preorder, inorder and postorder traversal for the following binary tree :   (3)