Roll No. ☐☐☐☐☐☐☐☐☐

S. No. of Question Paper : 6717

Unique Paper Code : 32371502   HC

Name of the Paper : **Statistical Computing using C/C++ Programming**

Name of the Course : **B.Sc (H) Statistics**

Semester : **V**

Duration : **3 Hours**

               Maximum Marks : **75**

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

All questions are compulsory.

1. Attempt any *ten* parts :

                     10 × 3 = 30

(*i*) State whether the following statements are true *or* false :

     (*a*) The **do-while** statement first executes the loop body and then evaluates the loop control expression.

     (*b*) The **default** case is required in the **switch** statement.

     (*c*) The return type of a function is int by default.

     (*d*) Parentheses can be used to change the order of evaluating expressions.

                         P.T.O.

(e)   The underscore can be used anywhere in an identifier.

(f)   An integer can be added to a pointer.

(ii)   Fill in the blanks :

(a)   A program start execution from............function.

(b)   The.............statement when executed in a switch statement causes immediate exit from the structure.

(c)   The.............specification is used to read or write short integer.

(d)   The.............operator returns the number of bytes the operand occupies.

(e)   The keyword.............can be used to create a data type identifier.

(f)   The escape sequence character.............causes the cursor to move to the next line on the screen.

(iii)   float x = -4.2, xmin = 4.7;

if (abs(x) <xmin) x = (x>0) ? xmin : -xmin;

printf("%f", x);

what will be the output of the above code ?

(iv)   What is a structure ? How does a structure differ from an array ?

(v)   Describe two different ways to access an array element.

(vi)   Consider the program segment to answer the following. In this case, assume that the memory addresses of x as 100, y as 300 and u starting from 700

double x=20.5, y=10.5, z;

double *px, *py;

int u[3][3] = {{1, 11, 111}, {2, 22, 222}; {3, 33, 333}};;

int *v;

px =&x;

py =&y;

v =&u[1][1];

z = (*v + 1)*(*px - y)/2;

(a)   What is the value of *px and z ?

(b)   What is the value of *(v-1)* *(v-4) ?

(vii)   Write a loop that will generate every third integer, beginning with $i = 2$ and counting for all integers that are less than 100. Calculate the sum of those integers that are divisible by 5.

(viii)   Write a conditional expression for the following :

If the variable divisor is not zero, divide the variable dividend by divisor and store the result in variable quotient. If the divisor is zero, assign it to the quotient.

(ix)   Given that int $x = 2$, $y = 3$, $z = 2$, $t = -4$; evaluate the following expressions :

(a) $z - (x + z)\%2 + y$

(b) $x! = z\&\&! (y < z) \| x > t$

(x)   What are function prototypes in C ? What is their purpose ? Illustrate with example.

(xi) Define a self-referential structure contacting the following three members :

(a) A 40 element character array called name

(b) An integer quantity called lost

(c) A floating point quantity called percent

Include the tag team within the structure definition.

(xii) Find error(s) in the following program :

```
#include<stdio.h>
main();
    {
            int 9x =2, y;
        scanf("%d",y);
            putchar(\n);
            printf('%c', "A");
            return(0);
    }
```

Write the output of any *two* parts from the following :

2×5=10

(i)
```
#include<stdio.h>
int a = 17;
main()
{
```

```
int a=5, b=12, x = 15, y = .2, z = -32765, t =100;
    float r, s;
        r = x>y ? x/y : x*y;
        s = z + 5;
b +=a;
a = b - a;
b = b - a;
printf("r = %f\n s=%f", r, s);
printf("a = %d \n b=%d", a, b);
printf("%d\n", 10 + ++t);
return (0);
}
```

(ii)
```
#include<stdio.h>
int func1(inta);
int func2(inta);
main()
{
inta=0,b=1, count;
for(count = 1; count <=5; count++)
    {
            b+=func1(a) + func2(a);
            printf("%d", b);
```

```
        }

    }

intfunc1(inta)

{

intb;

b=func2(a);

    return  (b);

    }

int func2(int  a)

    {

    static  int  b;

    b+=1;

    return  (b+a);

    }
```

(iii)   `#include<stdio.h>`

```
main()

    {

    inta, b, *p1, *p2, x, y, z;

    a = 12;

    b = 4;

    p1 = &a;

    p2 = &b;
```

```
    x = *p1 * * p2 - 6;

    y = 4* - *p2 / *p1 + 10;

    printf("a =%d, b =%d\n", a, b);

    pinrtf("x = %d, y = %d\n", x, y);

    *p2 = *p2 + 3;

    *p1 = *p2 - 5;

    z = *p1 * *p2 - 6;

    printf("a = %d, b = %d\n", a, b);

    printf("z = %d\n", z);

    return (0);

    }
```

3.   Attempt any *two* parts :   2×5=10

(i)   What is a pointer ? How can it be initialized ? Also, discuss how initial values can be assigned to two-dimensional arrays with the help of examples.

(ii)   Describe different forms of loop available in C. How would you decide the use of one of the three loops in C for a given problem ?

(iii)   Distinguish between the following with the help of examples :

    (a)   Global and local variables

    (b)   Actual and formal arguments

4.   Attempt any *two* parts : $4\frac{1}{2} \times 2 = 9$

(i)   Write a C-program to calculate the product of two matrices A and B of order $m \times n$ and $n \times p$ respectively.

(ii) Write a C-program to fit Poisson distribution to the following data :

x :	0	1	2	3	4	5
f :	109	65	22	7	3	1

(iii) Write a C program to compute the roots of quadratic equation $ax^2 + bx + c = 0$.

2×8=16

5. Attempt any *two* parts :

(i) In an experiment on immunization of cattle from tuberculosis, the following results were obtained :

	Affected	Unaffected
Inoculated	12	28
Not inoculated	13	7

Write a C-program to test whether vaccine is effective in controlling the incidence of the disease.

(ii) Develop a function to draw a random sample of size n from gamma distribution with parameters k and λ. Also find its mean and variance. Hence write a C-program to perform the above mentioned tasks using files.

(iii) Develop a function to calculate correlation coefficient for the data given on r.v.s X and Y. Hence, using the function, develop a program to compute multiple correlation coefficient of X on r.v.s Y and Z.