[This question paper contains 6 printed pages.]

1055   *Your Roll No.* ....

B.Sc. (Hons.) / II   C

STATISTICS -- Paper XVI

B-228 : (Computer Programming in C/FORTRAN-90) .

(Admissions of 1999 and onwards)

Time : 2 Hours   *Maximum Marks : 38*

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

Attempt **all** *questions.*

1. Attempt any **eight** parts :   (2×8)

    (i) State whether the following statements are True or False

        (a) A structure variable can be defined as a member of another structure.

        (b) An array cannot be included as a member of a structure

        (c) A unary expression consists of only one operand with no operator.

P.T.O.

    (d) Function parameters are separated by semicolons.

(ii) Fill in the blanks :

    (a) _____ is used to determine the order in which different operators in a complex expression are evaluated.

    (b) The C library that contains the prototype statements for file operations is _____ .

    (c) A _____ is a sequence of operands and operators that reduces to a single value.

    (d) To tell the compiler to store data at an address use the _____ operator.

(iii) Does *p++ increment p, or what it points to ?

(iv) What is the purpose of a header file ? Is the use of a header file absolutely necessary ?

(v) Rewrite each of the following expressions by replacing indirection operator (*) with the index operator ([...]).

    (a) *(tax + 6)

    (b) *(score + i + j)

    (c) *(num + k)

    (d) *price

(vi) Express each of the following algebraic formulas in a recursive form.

(a) $y = (x_1 * x_2 * \ldots\ldots\ldots * x_n)$

(b) $y = 1 + x + x^2/2 + x^3/6 \ldots\ldots\ldots + x^n/n!$

(vii) Define a self-referential structure containing the following three members

(a) a 40-element character array called name

(b) a integer quantity called lost

(c) a floating point quantity called percent Include the tag team within the structure definition

(viii) Evaluate the following expressions :

int i=8. j=5.k;

float x=0.5. y = −1.5;

(a) $(x > y)$ && $(i > 0)$ && $(j < 5)$

(b) k=(j==5) ? i : j

(ix) Describe two different ways to access an array element ?

2.   Attempt any **two** parts :   (3½×2)

(i) Given the following definitions :

int nuin[26] = {23, 3, 5, 7, 4, −1, 6};

int* n = num, i=2, j=4:

show the value of the following expressions :

(a) *n

(b) *n + 1

(c) *(n + 1)

(d) *n + j

(e) *(n + i) + j

(f) *(n+i+j)
       *(num + i) + *(num+j)

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

(iii) Describe the output generated by the following program :

```
#include <stdio.h>
int funl(int a):
int fun2(int a):
main( )
{     int a=0. b=1, count;
```

```
        for(count=1; count <=5; count++) {

            b += fun1(a) + fun2(a):

            printf("%d", b):

        }


int fun1(int a)

{

        int b:

        b = fun2(a):

        return(b):

}
int fun2(int a)

{

        static int b = 1:

        b += 1:

        return(b + a);

}
```

3. Attempt any **two** parts :   (4×2)

   (i) Write a C program to draw a random sample of
       size n from gamma distribution with parameter
       θ. Also find its mean and variance.

(ii) Write a C program to find the integral using Simpson's one-third rule

$$\int_{0}^{0.8} (\log(x) + \sin(2x) + x^2 dx$$

(iii) Write a C program to calculate the matrix multiplication and addition of two matrices A of order m*m and B of order m*m.

4. Attempt any **one** part :   (7)

(i) Write a C program to draw a random sample of size n from normal distribution with parameters mu and variance σ^2, save this sample in an output file and plot it.

(ii) Write a C program to find an Inverse of a matrix of order n using pointers.

(600)