This question paper contains 7 printed pages.]

1426 *Your Roll No. .....*

B.Sc. (Hons.) / II **A**

STATISTICS – Paper XVI

(Computer Programming in C/FORTRAN-90)

(For 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 :

(i) State True or False :

(a) One and only one function may be named main.

(b) Only integer values can be used in a constant.

(c) Variables defined within a block have global scope.

(d) Dynamically allocated memory can only be referred to through pointers.

[P.T.O.

(ii) Fill in the blanks :

(a) The _____ function reads data from the keyboard.

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

(c) The _____ logical operator is true only when both operands are true.

(d) _____ is a repetitive process in which a function calls itself.

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

(a) tax [6]

(b) score[i+j]

(c) num[k]

(d) prices[4*i]

(iv) Define a self-referential structure containing 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.

(v) 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

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

(vii) Write the first line of the function definition, including the formal argument declarations for each of the situations described below :

(a) A function called root accepts two integer arguments and returns a pointer to float.

(b) A function called process accepts an integer and two floating point arguments and returns a float.

(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 divisor is zero, assign it to quotient.

(ix) What is the difference between #include<stdio.h> and #include"stdio.h" ?

(x) What would be printed by the following program ?

```
#include<stdio.h>
int main(void)
{
    int list[10]={2, 1, 2, 1, 1, 2, 3, 2, 1, 2};
    printf("%d/n", list[2]);
    printf("%d/n", list[list[3]]);
    printf("%d/n",list[list[0] + list[4]]);
    printf("%d/n", list(list[list[6]]]);
    return 0;
}
```

2×8=16

2. Attempt any **two** parts :

(i) What is meant by looping ? Describe different forms of loop available in C.

(ii) Given the following definitions :

```
int num[26] = {23, 3, 5, 7, 4, -1, 6};
int* n = num. i = 2, j = 4;
```

find the values of the following expressions :

(a) n

(b) *n

(c) *n+1

(d) *(n+1)

(e) *n + j

(f) *&i

(g) *(n + i) + j

(h) *(n + i + j)

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

```
#include<stdio.h>
int a = 100, b = 200;
int fun1(int count);
int fun2(int c);
main( )
{   int count;
    for(count = 1; count < = 5; count ++)
            printf("/n%d", fun1(count));
}
fun 1 (int x)
{
    int c, d;
    c=fun2(x);
    d=(c<100) ? (a+c) : b;
```

```
    return (d);
}
fun2(int x)
{
    static int prod = 1;
    prod * = x;
    return (prod);
}
```

3½, 3½

3. Attempt any **two** parts :

(i) Write a C program to calculate the product of two matrices and of oedees mxn and nxi respectively.

(ii) 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.

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

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

4,4

4. Attempt any **one** part :

(i) Write a C program to find an inverse of a matrix of order **n** using **pointers**.

(ii) Write a C program to draw a random sample of size n from a normal population, using central limit theorem, with specified mean μ and variance σ^2. Calculate the mean and variance of the random sample. Plot these random points on the graphic screen taking x-axis as sample observation number and y-axis as sample observation. Use files to read and print the data.

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