

This question paper contains 8+4 printed pages]

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S. No. of Question Paper : 1163

Unique Paper Code : 237405 G

Name of the Paper : Computer Programming in C

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

Semester : IV

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

(i) What are the benefits of using pointers ?

(ii) Write a macro with arguments for selecting the greatest of three numbers using conditional operator.

(iii) How would a computer evaluate the following expressions for  $m = 2$ ,  $n = 5$  ? Give step-by-step sequence of operations by using precedence of operators :

(a)  $++n*n-- + 3*++m$

P.T.O.

- (b)  $m\%(n*6\%4)$
- (c)  $2*++m+3*++n*-$
- (iv) Fill in the blanks :
- (a) for( ; ; ) is an ..... loop.
- (b) The expression  $x[5]$  and  $5[x]$  are .....
- (c) Character array is a .....
- (d) ..... is specified in the place of return type for a function returning no value.
- (e) a pointer value of a variable that refers to a ..... location.
- (f) A file is opened by .....
- (v) Why do we recommend the use of parentheses for formal arguments used in macro definition ? Give an example.

- (vi) Explain what is likely to happen when the following situations are encountered in a program :
- (a) Actual arguments are less than the formal arguments in a function.
- (b) Data type of one of the actual arguments does not match with the type of the corresponding formal arguments.
- (vii) Write a for loop that initializes all diagonal elements of a two-dimensional array 'tmp' to one and others to zero. Assume 5 rows and 5 columns.
- (viii) Rewrite the following without using compound relations :
- ```
if((m1>60 && m2>60)|| t > 200)
    printf("admitted");
else
    printf("not admitted");
```

(ix) Distinguish between the initialization and assignment of variables.

(x) Explain the output of the following program segments :

(a) int a=4, b=5, s, t;

s=(a++)+b;

printf("s=%d",s);

t = --a+b;

s = t;

printf("\ns=%d",s);

(b) int x=10, y=15;

x = (x<y) ? (y+x) : (y-x);

printf("\nx=%d",x);

(xi) Analyse each of the following program segments and determine how many times the body of each loop will be executed :

(a) int i;

for(i=0; i<=5; i=i+2/3)

{

}

(b) int m=10, n=7;

while(m%n>0)

{

m++;

n+=2;

}

2. Attempt any two parts :

2×5

(a) What is meant by the storage class of a variable ?

Explain the four storage class specifications available in C.

(b) What are the different if statements available in C ?

Explain them with examples.

(c) Explain the output of the following program :

```
#include<stdio.h>
```

```
int a=100, b=200;
```

```

int fun1(int c);
main()
{
    int count, c;
    for(count=1; count <=5; count++)
    {
        c=4*count*count;
        printf("\n%d",fun1(c));
    }
}

fun1 (int x)
{
    int c;
    c=(x<50) ? (a+x) : (b-x);
    return(c);
}

```

3. Explain the output of the following programs (Attempt any two parts) :

2-5

(a) #include <stdio.h>

```
int sum (int*, int, int*);
```

```
int main (void)
```

```
{
```

```
int a=4, b=17;
```

```
int c[5]={9,14,3,15,6};
```

```
int* pc=c;
```

```
a=sum(pc, a, &b);
```

```
printf("2. %d %d %d %d %d %d %d %d\n", a, b,
c[0], c[1], c[2], c[3], c[4]);
```

```
return 0;
```

```
}
int sum (int* px, int y, int* pz)
```

```
{
```

```
int i=5;
```

```
int* p;
```

```

printf("1. %d %d %d\n", *px, y, *pz);
for(p=px; p<px+5; p++)
    *p=y+*p
    *px=2*i;
return(*pz+*px+y);
}

```

(b) #include<stdio.h>

```
void main()
```

```
{
```

```
    int i, j, ele, a[20];
```

```
    clrscr();
```

```
    ele=1235;
```

```
    i=0;
```

```
    while(ele>0)
```

```
{
```

```
    a[i]=ele%8;
```

```
    i++;
```

```
    ele=ele/8;
```

```
}
```

```
printf("\n Number is");
```

```
for(j=i-1, j>=0; j--)
```

```
    printf("%d", a[j]);
```

```
}
```

(c) #include<stdio.h>

```
void fib(int n);
```

```
void main()
```

```
{
```

```
    int n;
```

```
    clrscr();
```

```
    n=10;
```

```
    printf("Series is ");
```

```
    fib(n);
```

```
}
```

```
void fib(int n)
```

```
{
```

```
    static int a,b;
```

```
    int c;
```

```
    if(n<2)
```

```

{
    a=0;
    b=1;
}
else
{
    fib(n-1);
    c=b;
    b=a+b;
    a=c;
}
printf("%d ", a);
}

```

4. Attempt any two parts :

2×5

- (a) Write a C program to draw a random sample of size  $n$  from chi-square distribution with  $k$  degrees of freedom. Also find its mean and variance.

- (b) Develop a C program to find median of the given discrete data in the form :

$$\{(x_i, f_i), i = 1, 2, 3, \dots, n \leq 25\}.$$

- (c) Develop a C program to obtain  $C = A \times B$ , where  $A$  is  $m \times n$  and  $B$  is  $n \times p$  matrix and  $m, n, p \leq 5$ .

5. Attempt any two parts :

7/2×2

- (a) Write a C program to calculate the moving average of size  $m$  for a sample of  $n$  observations.
- (b) 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.

- (c) Develop a C program to obtain the value of

$$\int (\log x + \sin(2x) + x^2) dx,$$

for  $h = 0.1$  and  $x$  lying between 0 and 0.8 using

Simpson's  $\frac{3}{8}$ th rule.