B.SC. THIRD SEMESTER (HONOURS) EXAMINATIONS, 2021

Subject: Mathematics **Course ID: 32115**

Course Code: SH/MTH/305/SEC-1 **Course Title: Programming using C**

Full Marks: 40 **Time: 2 Hours**

The figures in the margin indicate full marks

Notations and symbols have their usual meaning

1. Answer *any five* of the following questions: $\mathbf{2 \times 5 = 10}$

a) If S and B are two integers, then state the purpose of the following program segment:

B=S+B; S=B-S; B=B-S;

b) State the ASCII values of the C-characters "A" and "a".

c) State the output of the following program segment:

```
int i,j;
for(i=1,j=10; i<6; ++i, --j)
printf("%d,%d,",i,j);
```

d) State the output of the following program segment:

```
int a=9, b=12, c,d;
c=a/b*b; d=a*b/b;
printf("%d,%d",c,d);
```

e) Find the output of the following program segment:

```
int a=2,b=3;
printf("%d",a,b);
```

f) Find the error of the following program segment:

```
Int a,b,c;
scanf("%d%d%d",a,b,c);
```

g) Write the structure of 'For Loop'.

h) What is the difference between Local and Global variable?

2. Answer *any four* of the following questions: $\mathbf{5 \times 4 = 20}$

a) Write a C-program to find the sum of the following series:

$$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \ldots\ldots\ldots\ldots + \frac{1}{99^2} - \frac{1}{100^2}$$

b) Write a C-program to find the factorial of a given non-negative integer.

c) If the lengths of three sides of a triangle is given, then write a program to find the area of the triangle.

d) If the ages of X,Y and Z are given. Write a program to find the youngest of the three.

e) What will be output and why

```
Int i=0;
for(i=0;i<5;i++)
if(i<4)
{
printf("Hello");
break;
}
```

f) Write a C-program to find the trace of a given $n \times n$ square matrix.

3. Answer *any one* of the following questions: $\mathbf{10 \times 1 = 10}$

a) i) State the general structure of a function definition in C. Write a C-program to find the area of a rectangle using function. Your program should contain a function for computing the area of a rectangle.

ii) State the output of the following program segment:

```
for (i=1; i<=25; ++i)
    if (i % 3= = 0)  continue;
    else if (i> 21)  break;
else  printf(" %d ,", i+4);
```

(1+5)+4

b) i) Point out error

```
int x=10,y=15;
if(x%2=y%3)
printf("Captain\n");
```

ii) Any year is given. Write a program to determine whether given year is leap or not.

iii) Three angles of a triangle are given. Write a program to check whether the triangle is valid or not. 3+4+3

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