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**MMT-001**

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**M.SC. (MATHEMATICS WITH  
APPLICATIONS IN COMPUTER SCIENCE)**

**M.SC. (MACS)**

**Term-End Examination**

**June, 2024**

**MMT-001 : PROGRAMMING AND DATA  
STRUCTURES**

*Time : 1½ Hours*

*Weightage : 20%*

**Note :** Question No. 1 compulsory. Answer any three questions from Question No. 2 to 5. All programs should be written in C language only. Use of calculators is not permitted.

1. Write the output of the following segments of code.  
Justify your answer with short explanations :

(a) into main ( )

```
{ float a = 10.0;
```

```
    a = a% 3;
```

```
    printf("%f", a);
```

```
    }return 0;
```

(b) int main ( )

```
{
```

```
int a = 9;
```

```
if (a = 8)
```

```
{
```

```
    printf("coffee\n");
```

```
}
```

```
    print f("Tea\n");
```

```
return 0;
```

```
}
```

(c) int main ( )

```
{ int sum = 0, i;
```

```
    for (i = 0; i <= 10; i ++)
```

```
        { sum = sum + i ++;
```

```
          sum = sum - i;
```

```
        }
```

```
    print f ("% d", sum);
```

```
return 0;
```

```
}
```

**P.T.O.**

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```
(d) int main ( )
    { int b = 25;
      int *p;
      p = &b;
      printf (“%d, %d”, b++, *p);
      return 0;
    }

(e) void texas (int*, int*);

int main ( )
    {int a = 11, b = 22,
      printf (“Before = %d %d”, a,b);
      texas (&a, &b)
      printf (“After = %d %d”, a, b);
    }return 0;

void texas (int *i, int *j)
    {*i = 55, *j = 65;}
```

2. (a) Write a program in C to find the minimum of a list of integers. Support your code with suitable comments. 3

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- (b) Explain the relation between arrays and pointers in ‘C’, with suitable examples. 2
3. (a) What is a sparse matrix ? Give disadvantages of sparse matrices and also the way to overcome them. 3
- (b) Compare a tree and binary tree. 2
4. (a) Write a program in ‘C’ to create a singly linked list of integers. Support your code with suitable comments. 3
- (b) Explain call by value and call by reference with suitable example for each. 2
5. (a) Write a ‘C’ function to implement the strcpy( ) function of C library. 2
- (b) Write a recursive function in ‘C’ to find the factorial of a number. Use this function to find the factorial of 100 in the main program. 3

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