B.E. CONSTRUCTION ENGINEERING FIRST YEAR FIRST SEMESTER - 2018

Sub: Numerical Methods and Computer Programming

Time: 3 Hours

Full Marks: 100

Answer any 5 questions

Answer all parts of a question in contiguous location.

1. If you try to compile and run the following code what will happen? Explain.(Answer any five from following) 5*4=20

a.
```
void main()
{
  int a=10,i=0;
for( ; i<a; i--)
  printf("Say Hello");
}
```

b.
```
void main()
{
  int m = 1, n = 1;
  if(m = 0 || n > 1)
    printf("Check it.");
  else
    printf("Will it be in else?");
}
```

c.
```
void main()
{
  int a=1,b,c;
b=a++;
c=a;
printf("%d %d %d", a, b ,c);
}
```

d.
```
void main()
{
int a=1;
while(a=1)
  a=a-1;
printf("%d", a);
```

e.
```
void main()
{
    int a=1,b=0,c ;

if(a&&b)
    c=0;
   else
    c=1;
     printf("%d %d %d", a, b ,c);
}
```

f.
```
#define f(x) x + x

 void main()

{

   int i=3, j;

   j=f(i)*f(i);

   printf("%d", j);

}
```

2. Write short notes on (Any five) :: 5*4=20

i. Functions in C
ii. Different control statements in C
iii. Advantages of using if else over switch case
iv. Call by value and call by reference
v. Data types in C
vi. Array
vii. Operators in C

3. Solve following problems 2*10=20

a. Solve the following equation using Gauss Elimination method

$$2x-y+2z = 10$$
$$x-2y+z = 8$$
$$3x-y+2z = 11$$

b. Find root of the equation $x^3-3x+1=0$ by Newton Raphson method. Correct upto 4 decimal places.

4. Write any two program from following in C 2*10=20

i. Write a program using function to calculate factorial of a number.
ii. Write a program using switch case to implement calculator with addition, subtraction, multiplication and division.
iii. Write a program using function to check whether a number given by user and its reverse is same or not.

5. a. Write a program to add elements of two 1D array and store result in another 1D array. 18

b. Find the solution of the problem using hierarchy of operations 2

2*3/4+4/4+8-2+5/8

6. Solve following problems ::

2*10=20

i. Find the value of tan 0.12 using Newton Forward method

x	0.10	0.15	0.20	0.25	0.30
tan x	0.1003	0.1511	0.2027	0.2553	0.3093

ii. Use the 4th order Runge-Kutta method with h = 0.1 to find the approximate solution for y(1.1), working to 4 decimal places, for the initial value problem:

$dy/dx = 2xy, \quad y(1) = 1$