IFoS-2018 → paper II

5)(c) write a program in BASIC to multiply two matrices (checking for consistency for multiplication is required).

⇒
```
# include <stdio.h>
# include <conio.h>
# include <math.h>
void main()
{
int a[10][10], b[10][10], c[10][10];
int i, j, k, m, n, o, p;
clrscr();
Printf("\n Enter the number of rows and columns of
                                    1st matrix : ");
scanf("%d%d", &m, &n);
for (i=0; i<m; i++)
for (j=0; j<n; j++)
scanf("%d", &a[i][j]);
printf("\n Enter the number of rows and columns of
                                    2nd matrix : ");
scanf("%d%d", &o, &p);
for (i=0; i<o; i++)
for (j=0; j<p; j++)
scanf("%d", &b[i][j]);
if (n==o)
{
for (i=0; i<m; i++)
```

```
for (j=0; j<P; j++)
{
c[i][j]=0;
for(k=0; k<n; k++)
c[i][j]=c[i][j] + (a[i][k] * b[k][j]);
}
}
else
{
printf("\n matrices not conformable for multiplication");
exit(0);
}
Printf("\n The resultant matrix is: \n");
for (i=0; i<m; i++)
{
 for (j=0; j<P; j++)
 Printf("%4d", c[i][j]);
 Printf("\n");
}
 getch();
}
```

6)(d) write a program in BASIC to implement trapezoidal rule to compute $\int_0^{10} e^{-x^2} dx$ with 10 subdivisions.

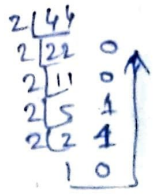
=>
```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
float a,b,h,x,y,y0,yn,xn,s,r;
int i,n;
float f(float);
clrscr();
Printf("\n Enter the lower limit: ");
scanf("%f",&a);
```

```
printf ("\n Enter the upper limit: ");
scanf ("%f", &b);
printf ("\n Enter the interval: ");
scanf ("%d", &n);
h = (b-a)/n;
y0 = f(a);
yn = f(b);
x = a+h;
s = 0
for (i=1; i<=(n-1); i++)
{
  y = f(x);
  s = s+y;
  x = x+h;
}
r = (h/2) * ((y0+yn) + (2*s));
printf ("\n The result is: %f ", r);
getch();
}
float f (float x)
{
return (exp(-x*x));
}
```

7) (e) Assuming a 16-bit Computer representation of signed integers, represent (-44) in 2's Complement representation

⇒ 16 bit representation of 44 is,

$44 \equiv 00000000\ 00101100$



1's complement of 44 is,

11111111 11010011

So, the 2's Complement representation is,

$(-44) \equiv 11111111\ 11010011 + 1$

$= 11111111\ 11010100$