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Exam :- Computer Graphics and Animation
End sem Practical Examination

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Subham Singh

Q2
Ans

CODE

```
#include <graphics.h>
#include <stdlib.h>
#include <stdio.h>
#include <conio.h>
#include <math.h>
void main()
{
int gm;
int gd = DETECT;
int x1, x2, x3, y1, y2, y3, nx1, nx2, nx3, ny1, ny2, ny3, c;
int Sx, Sy, xt, yt, x;
float t;
initgraph (&gd, &gm, " ");
Printf ("Program for basic transaction");
Printf ("Enter the point of triangle");
setcolor(1);
Scanf ("%d%d%d%d%d%d", &x1, &y1, &x2, &y2, &x3, &y3);
line(x1, y1, x2, y2);
line(x2, y2, x3, y3);
line(x3, y3, x1, y1);
getch();
Printf ("\n1. Transaction \n2. Rotation \n3. Scaling \n4. exit");
Printf ("\n Enter your choice:");
Scanf ("%d", &c);
switch (c)
{
```

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Case 1:

```
printf("\n Enter the translation factor");
scanf("%d%d", &xt, &yt);
nx1 = x1 + xt;
ny1 = y1 + yt;
nx2 = x2 + xt;
ny2 = y2 + yt;
nx3 = x3 + xt;
ny3 = y3 + yt;
line(nx1, ny1, nx2, ny2);
line(nx2, ny2, nx3, ny3);
line(nx3, ny3, nx1, ny1);
getch();
```

Case 2:

```
printf("\n Enter the angle rotation");
scan("%d", &k);
t = 3.14 * k / 180;
nx1 = abs(x1 * cos(t) - y1 * sin(t));
ny1 = abs(x1 * sin(t) + y1 * cos(t));
nx2 = abs(x2 * cos(t) - y2 * sin(t));
ny2 = abs(x2 * sin(t) + y2 * sin(t));
nx3 = abs(x3 * cos(t) - y3 * sin(t));
ny3 = abs(x3 * sin(t) + y3 * cos(t));
line(nx1, ny1, nx2, ny2);
line(nx2, ny2, nx3, ny3);
line(nx3, ny3, nx1, ny1);
getch();
```

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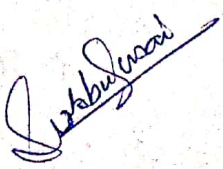
```
case 3:
        printf("\n Enter the scalling factor");
        scanf("%d%d", &sx, &sy);
        nx1 = x1 * sx;
        ny1 = y2 * sy;
        nx2 = x2 * sx;
        ny2 = y2 * sy;
        nx3 = x3 * sx;
        ny3 = y3 * sy;
       line(nx1, ny1, nx2, ny2);
       line(nx2, ny2, nx3, ny3);
       line(nx3, ny3, nx1, ny1);
        getch();

case 4:
        Break;
    default:
        printf("Enter the correct choice");
    }
        closegraph();
}
```



Q3

Ans

Source code:-

```
#include<stdio.h>
#include<graphics.h>
void main()
{
 int gd=DETECT, gm;
 int r, x, y, p, xc=320, yc=240;
 Printf("Enter the radius");
 Scanf("%d", &r);
 initgraph(&gd, &gm, "");
  x=0
  y=r;
 Putpixel(xc+x, yc-y, 1);
 P=3-(2*r);
 for(x=0; x<=y; x++)
 {
      if(P<0)
      {
        y=y;
        P=(p+(4*x)+6);
      }
      else
      {
        y=y-1;
        P=P+((4*(x-y)+10));
      }
```

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```
        putpixel(xc+x, yc-y, 1);
        putpixel(xc-x, yc-y, 2);
        putpixel(xc+x, yc+y, 3);
        putpixel(xc-x, yc+y, 4);
        putpixel(xc+y, yc-x, 5);
        putpixel(xc-y, yc-x, 6);
        putpixel(xc+y, yc+x, 7);
        putpixel(xc-y, yc+x, 8);
    }
    getch();
    closegraph();
}
```

Algorithm :-

Step 1 – Start

Step 2 – Declare integer variables $x, r, y, p, xc = 320$ and $yc = 240$. where r is the radius of the circle.

Step 3 – Enter the value of radius

Step 4 – Initialize $x = 0$ and $y = r$.

Step 5 – Plot putpixel $(xc + x, yc - y, 1)$

Step 6 – Calculate $p = 3 - 2r$

Step 7 – Check if the whole circle is scan converted
if $x >= y$ stop

Step 8 – Plot eight point by using concept of eight way symmetry. Current active pixel is x, y.
Center is at (a, b)
Putpixel $(x+a, y+b)$
Putpixel $(y+a, x+b)$
Putpixel $(-y+a, x+b)$
Putpixel $(-x+a, y+b)$
Putpixel $(-x+a, -y+b)$
Putpixel $(-y+a, -x+b)$
Putpixel $(y+a, -x+b)$
Putpixel $(x+a, -y-b)$

Step 9 – Find location of next pixel to be scanned
if $p < 0$
then $y = y$
$p = p + 4x + 6$

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else

$p = p + 4(x-y) + 10$

decrement $y = y - 1$

Step 10 – Go to step 7.

Step 11 – Stop