

END-TERM PRACTICAL EXAM

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COURSE - BCA - 6B

UNIVERSITY ROLL NO - 1121093

CLASS ROLL NO - 13

SUBJECT - COMPUTER GRAPHICS AND
ANIMATIONS (PRACTICAL)

SUBJECT CODE - PRC-602

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P3: Write an algorithm and Program to implement Bresenham Circle Drawing Algorithm.
Algorithm:

Steps: Start

Step 2: Declare p, q, x, y, r, d variables
 p, q are coordinates of the center of the circle.
 r is the radius of the circle.

Step 3: Enter the value of r

Step 4: Calculate $d = 3 - 2r$

Step 5: Initialize $x = 0$
 $\text{Ansy} = r$

Step 6: Check if the whole circle is scan converted.
if $x \geq y$
Stop.

Step 7: Plot eight points by using concepts of eight-way symmetry. The center is at (p, q) . Current active pixel is (x, y) .

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putpixel ($x+p, y+q$)

putpixel ($y+p, x+q$)

putpixel ($-y+p, x+q$)

putpixel ($-x+p, y+q$)

putpixel ($x+p, -y+q$)

putpixel ($-y+p, -x+q$)

putpixel ($y+p, -x+q$)

putpixel ($x+p, -y-q$)

Step 8: Find location of next pixel to be scanned

if $d < 0$

then $d = d + 4x + 6$

increment $x = x + 1$

if $d \geq 0$

then $d = d + 4(x - y) + 10$

increment $x = x + 1$

decrement $y = y - 1$

Step 9: Go to step 6

Step 10: Stop.

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Program :

```
#include <graphics.h>
#include <stdlib.h>
#include <stdio.h>
#include <conio.h>
#include <math.h>
```

void EightWaySymmetricPlot(int xc, int yc, int x, int y)

```
{
    putpixel(x+xc, y+yc, RED);
    putpixel(x+xc, -y+yc, YELLOW);
    putpixel(-x+xc, -y+yc, GREEN);
    putpixel(-x+xc, y+yc, YELLOW);
    putpixel(y+xc, x+yc, 12);
    putpixel(y+xc, -x+yc, 14);
    putpixel(-y+xc, -x+yc, 15);
    putpixel(-y+xc, x+yc, 6);
}
```

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void BresenhamCircle(int xc, int yc, int r)

{

int x = 0, y = r, d = 3 - (2 * r);

EightWaySymmetricPlot(xc, yc, x, y);

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```
while (x <= y)
```

```
{
```

```
    if (d <= 0)
```

```
    {  
        d = d + (4 * x) + 6;
```

```
    }
```

```
    else
```

```
    {  
        d = d + (4 * x) - (4 * y) + 10;
```

```
        y = y + 1;
```

```
    }
```

```
    x = x + 1;
```

```
    EightWaySymmetricPlot(xc, yc, x, y);
```

```
}
```

```
}
```

```
int main(void)
```

```
{
```

```
    int xc, yc, r, gdriver = DETECT, gmode, errorcode;
```

```
    initgraph(&gdriver, &gmode, "C:\\TURBOC3\\BG1");
```

```
    errorcode = graphresult();
```

```
    if (errorcode != GR_OK)
```

```
    {
```

```
        printf("Graph's error: %s\n", grapherrormsg(errorcode));
```

```
        printf("Press any key to halt:");
```

```
        getch();
```

```
        exit(1);
```

```
}
```


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```
printf ("Enter the value of xc and yc");  
scanf ("%d %d", &xc, &yc);  
printf ("Enter the value of radius:");  
scanf ("%d", &r);  
BresenhamCircle (xc, yc, r);  
getch();  
closegraph();  
return 0;
```

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