



EASTERN UNIVERSITY, SRILANKA

DEPARTMENT OF MATHEMATICS

THIRD EXAMINATION IN SCIENCE –2007/2008

FIRST SEMESTER (Feb./Mar. 2010)

CS 351 – PRACTICAL WORK ON CS301

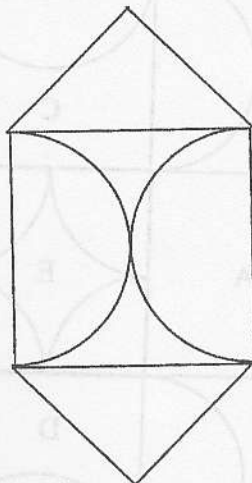
(Proper and Repeat)

Answer all questions

Time allowed: 02 hours

1.

- (i) Write a C++ function called **lineDDA** (int x0,int y0,int x1,int y1) to implement the **Digital differential analyzer (DDA)** line drawing algorithm, where (x0,y0) and (x1,y1) are end points of the line.
- (ii) Write a C++ function called **midCIR** (int xc, int yc, int r) to implement the **bresenham** midpoint circle drawing algorithm, where (xc, yc) is the center point of the circle and r is the radius of the circle.
- (iii) Create the picture as given below using the above line drawing and circle drawing functions.



- (iv) Fill the picture with any background color.

2.

- (i) Create a class called *pixel* to represent (x y) pixel position in display screen with some attributes and implement the methods given below to perform the following task.

**Public attributes:**

Int x,y; // To store the x,y coordinates,

**Public methods:**

Pixel(); //A default constructor to initialize x,y to default values.

Pixel (int x1,int y1); // A user defined constructor to initialize x,y.

Setx() //set the x coordinate.

Sety() //set the y coordinate.

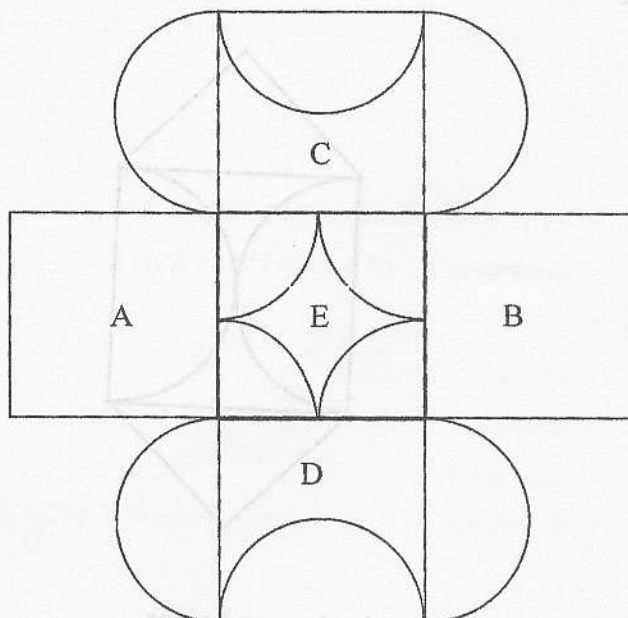
Getx() //return the x coordinate.

Gety() //return the y coordinate.

Void plot (int cl); //plot the (x,y) coordinates.

Void rotate (float theta, pixel pivot); //rotate this pixel through theta degree with respect to the pivot.

- (ii) Using midpoint circle algorithm and DDA line algorithm construct a *mypicture* class and create the picture as given below.



- (iii) Display them in the center of your screen.
- (iv) Translate the squares C, D and E, pixel co-ordinate is  $x=10, y=0$ .
- (v) Rotate Center square (E) by  $45^{\circ}$  and Rotate squares A and B by  $60^{\circ}$  when you are press any key on the keyboard.
- (vi) Enlarge and tiny the given squares from the origin using scaling algorithm.

1. "Fishes are successfully living in different aquatic systems". Briefly discuss this statement with reference to osmoregulatory mechanisms.

2. Comment on the type of migration in fishes.

3. Write notes on all of the following:

(a) Adaptive radiation among bony fishes

(b) Fecundity in fishes

(c) Morphometry in determination of feeding habits of fish.