**E.G.S.P.ENGINEERING COLLEGE,NAGAPATTINAM**

**DEPARTMENT OF MCA**

**Week test I ANS KEY**

**Subject Code/Name : MC9234/Computer Graphics Marks : 100**

**Sem/Year : III/II Time : 3hrs**

**Staff Name : S.Selvaganapathy Date : 25-07-2013**

1. What is normalization transformation?

In a 2D viewing, when all coordinate transformations are completed,view-port clipping can be performed in normalized coordinates or in device coordinates.

This allows us to reduce computations by concatenating the various transformation matrices.

This process is called as **normalization transformation.**

1. Define region code. State its use

The region code that identify the location of end point relative to the boundary of the clipping rectangle.

This line that forms the clipping window divides the area into 9 regions.

Each bit position in the region code is used to indicate one of four relative coordinates position of point with respect to clip window.

1. What are the basic kinds of displays used in virtual reality application?

The kinds of display used in virtual reality applications are:

Immersive

Augmented

Text based

Desktop(Window on a world)

Video Mapping

1. Distinguish **between bitmap and pixmap**

0n a Black and white system with one bit per pixel,the frame buffer is commonly called a **bitmap**.For systems with multiple bits per pixel,the frame buffer is referred to as a pixmap.

1. Define viewport

A world-coordinate area selected for display is called a window.An area on a display device to which a window is mapped is called a viewport.

The window defines what is to be viewed;the viewport defines where it is to be displayed.

1. What is meant by clipping?

Any procedure that identifies those portions of a picture that are either inside or outside of a specified region of space is referred to as a clipping algorithm,or simply clipping

The region against which an object is to clipped is called a clip-window

1. What are called homogeneous coordinates?

In order to represent all transformations in the same form,computer scientists have designed a coordinates called homogeneous coordinates.

It is a 3x3 matrix which allows us to express all transformation equations as multiplication.

1. Write any two input modes which specify how the program and input devices interact

The input modes in which the program into the input devices interact are as follows:

In **request mode,** the application program initiates data entry.Input values are requested and processing is suspended until the required values are received.This input mode corresponds to typical into operation in a general programming language.The program and the input devices operate alternately.Devices are put into a wait state until an input request is made;then the program waits until the data are delivered.

In **sample mode,** the application program and input devices operate independently.Input devices may be operating at the same time that the program is processing other data.New input values from the input devices are stored,replacing previously input data values.When the program requires new data,it samples the current values from the input devices.

1. How do you identify a Concave Polygon

*A polygon that has one or more*[*interior angles*](http://www.mathopenref.com/polygoninteriorangles.html)*greater than 180°*

A concave polygon is defined as a polygon with one or more [interior angles](http://www.mathopenref.com/polygoninteriorangles.html) greater than 180°. It looks sort of like a vertex has been 'pushed in' towards the inside of the polygon. Note that a triangle (3-gon) can never be concave.

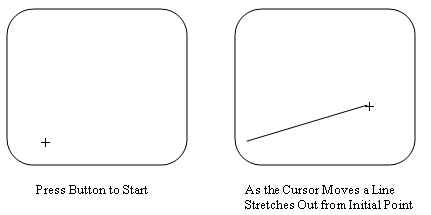
A concave polygon is the opposite of a convex polygon.

1. Explain the Rubber-band method for constructing a line

Straight lines can be constructed and positions using rubber band method, which stretch out a line from a starting position as the screen cursor is moved.

In a rubber band method, first select a screen position for one end point of the line. Then , as the cursor moves around, The line is displayed form the start position to the current position of the cursor.When we finally select a second screen position,The other line end point is set. Rubber band methods of used to construct and position other object besides straight lines.

**Rubber Band Methods used to construct and position straight lines.**



**PART B**

1. a. What is a transformation? Explain its type.(or)

b. Describe the various Interactive Picture Construction Techniques

1. a. Describe Window to View port mapping with suitable diagrams(or)

b. Describe the various Input Functions

1. a. Explain Nicholl-Lee-Nicholl Line Clipping algorithm(or)

b. Describe the various Text Clipping methods with examples

1. a. Explain Cohen-Sutherland Line Clipping Algorithm(or)

**b. Explain about clipping operations**

Clip a picture from either outside or inside a region known as clipping Also called as clipping algorithm

The region against the object is known as clip window

Clipping operations on different types of objects

• Point clipping

• Polygon clipping

• Area clipping

• Line clipping

• Curve clipping

• Text clipping

• Polygon and line clipping are the standard clipping components

1. a. Explain Sutherland Hodgeman polygon clipping(or)

• Clipping polygon which lies inside the clipping window

• Four possible cases

• If the first vertex is outside the window boundary and the second vertex inside

• If the first vertex is inside the window boundary and the second vertex outside

• If both are outside

• If both are inside

• Repeat the process of algorithm

• Convex polygon are correctly clipped using this clipping

• Concave and convex polygon are also used

b. Explain Liang Barsky line clipping

Faster line clipper of the parametric equation of a line segment

• Line parallel to one of the clipping boundaries

• Line intersects the extension of boundary k

• If u1 > u2 line is outside the clipping window

• Else inside the clipping window

• Clipping is done using the reflection in the clip window