	PUNE INSTITUTE OF COMPUTER TECHNOLOGY, PUNE -43		
	Department of Electronics and Telecommunication Engineering		
	ASSESSMENT YEAR: - 2021-22		**CLASS: - TE-V**
	Subject: - Advanced Java Programming		
Expt. No: 1	**LAB Ref: ETC/2021-22/**	**ROLL NO:32147**	**SUBMISION DATE:**

Title: - AWT Frame creation

Problem Statement: -

Write a program to create a frame using AWT.

1) Association method 2) Inheritance Method

Objectives: -

- To learn the concepts of Frame class and its methods

Theory (Write Theory of the new concept demonstrated in this Assignment)

The Abstract Window Toolkit (AWT) supports Graphical User Interface (GUI) programming. AWT features include:

- A set of native user interface components
- A robust event-handling model
- Graphics and imaging tools, including shape, color, and font classes
- Layout managers, for flexible window layouts that do not depend on a particular window size or screen resolution
- Data transfer classes, for cut-and-paste through the native platform clipboard

Frame class:

A Frame is a top-level window with a title and a border.

The size of the frame includes any area designated for the border. The dimensions of the border area may be obtained using the getInsets method, however, since these dimensions are platform-dependent, a valid insets cannot be obtained until the frame is made displayable by either calling pack or show. Since the border area is included in the overall size of the frame, the border effectively obscures a portion of the frame, constraining the area available for rendering and/or displaying subcomponents to the rectangle which has an upper-left corner location of (insets.left, insets.top), and has a size of width - (insets.left + insets.right) by height - (insets.top + insets.bottom).

The default layout for a frame is BorderLayout.

A frame may have its native decorations (i.e. Frame and Titlebar) turned off with setUndecorated. This can only be done while the frame is not displayable.

In a multi-screen environment, you can create a Frame on a different screen device by constructing the Frame with Frame(GraphicsConfiguration) or Frame(String title, GraphicsConfiguration).

The GraphicsConfiguration object is one of the GraphicsConfiguration objects of the target screen device.

Methods of frame class:

1.setTitle(String title)
Sets the title for this frame to the specified string.

2.setBackground(Color bgColor)
Sets the background color of this window.

3. isUndecorated()
Indicates whether this frame is undecorated.

4.setSize(width,heigth)
Sets the size of the frame

5.setLocation(x,y)
Sets the location of the frame to be appear

6.setShape(Shape shape)
Sets the shape of the window.

There are three ways to create a frame:

1. By creating the object of Frame class (association)
2. By extending Frame class (inheritance)
3. Create a frame using Swing inside main()

Way 1: By creating the object of Frame class (association)

In this, we will see how to create a JFrame window by instantiating the JFrame class.

```
// creating instance of JFrame with name "first way"
    frame=new JFrame("first way");
```

Way 2: By extending Frame class (inheritance)

In this example, we will be inheriting JFrame class to create JFrame window and hence it won't be required to create an instance of JFrame class explicitly.

Eg:

```
public class test2 extends JFrame
{
   JFrame frame;
   test2()
   {
      setTitle("this is also a title");

      // setting close operation
      setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

      setSize(400, 500);
      setLayout(null);
      setVisible(true);
   }

}
```

Way 3: Create a frame using Swing inside main()

Eg:

```
public static void main(String[] args)
   {
      // creates instance of JFrame
      JFrame frame1 = new JFrame();
```

```
    // creates instance of JButton
    JButton button1 = new JButton("click");
    JButton button2 = new JButton("again click");

    // x axis, y axis, width, height
    button1.setBounds(160, 150 ,80, 80);
    button2.setBounds(190, 190, 100, 200);

    // adds button1 in Frame1
    frame1.add(button1);

    // adds button2 in Frame1
    frame1.add(button2);

    // 400 width and 500 height of frame1
    frame1.setSize(400, 500) ;

    // uses no layout managers
    frame1.setLayout(null);

    // makes the frame visible
    frame1.setVisible(true);
  }
```

Diagram: -

Learning Outcomes: -		
	1	Studied the AWT its advantages and disadvantages
	2	Understood about frames and different methods in frame class.
	3	Understood different ways of creation of frame.
	4	With studying about different ways we understand that which method can be used more
		efficiently

Continuous Assessment			
RPP (out of 5)	**SPO (out of 5)**	**Total (Out of 10)**	**Sign**
			Date: -

#(RPP – Regularity, Punctuality, Performance), (SPO – Submission, Presentation, Oral)

Important Questions: -
1.What is AWT?
2.What are Frames? Describe the Frame class with its methods included in it
3.What are different ways of creating frames and which method is used frequently?
4.What is mean by creating a frame by inheritance method explain with example?
5.What is difference between Frame and JFrame?