

# Theory Exercise

## ANS - 1 :

Stateless Widget	Stateful Widget
A widget that never changes its state once built	A widget that can change its state during runtime
Immutable (fixed)	Mutable (can change using <code>setState()</code> )
Static content (e.g., labels, icons)	Dynamic content (e.g., form inputs, counters)
More efficient (since it doesn't rebuild often)	Slightly less efficient (due to frequent rebuilds)
Text, Icon, Image	Checkbox, Slider, TextField
Extends <code>StatelessWidget</code> and overrides <code>build()</code>	Extends <code>StatefulWidget</code> and creates a <code>State</code> class
Rebuilds only when parent widget changes	Rebuilds when <code>setState()</code> is called within the widget

## ANS - 2 :

- **Key Lifecycle Methods:**
  - `createState()` → Creates the mutable state.
  - `initState()` → Called once when the widget is inserted.
  - `build()` → Called every time UI is updated.
  - `setState()` → Triggers UI rebuild with new state.
  - `dispose()` → Called when widget is removed, used to clean resources.
- **State Management:** Use `setState()` inside the `State` class to update UI based on user interaction or data change.

## **ANS - 3 :**

### **1. Stack**

- Allows widgets to be placed on top of each other (overlapping).
- Useful for positioning elements freely.

```
Stack(  
  children: [  
    Container(width: 100, height: 100, color: Colors.red),  
    Positioned(  
      top: 10,  
      left: 10,  
      child: Text('On Top'),  
    ),  
  ],  
)
```

### **2. ListView**

- A scrollable list of widgets arranged vertically.
- Ideal for displaying dynamic or long lists.

```
ListView(  
  children: [  
    ListTile(title: Text('Item 1')),  
    ListTile(title: Text('Item 2')),  
  ],  
)
```

### **3. Padding**

- Adds empty space (padding) around a widget.

```
Padding(  
  padding: EdgeInsets.all(16.0),
```

```
    child: Text('Padded Text'),  
  )
```

#### **4. Align**

- Aligns a child widget within its parent.

```
Align(  
  alignment: Alignment.bottomRight,  
  child: Text('Bottom Right'),  
)
```

#### **5. SizedBox**

- Adds fixed space or size between/around widgets.

```
SizedBox(height: 20) // Adds vertical space
```