



## School of Engineering and Technology

**Subject: BEEE**

**Subject Code: 24BEELY104**

### UNIT 4

#### Sample Questions:

**2 Marks**

- ✓ Define Current gain(  $\alpha$  )
- ✓ Define Current gain(  $\beta$  )
- ✓ In a common base connection,  $I_C = 0.95 \text{ mA}$  and  $I_B = 0.05 \text{ mA}$ . Find the value of  $\alpha$ .
- ✓ Find the value of  $\beta$  if (i)  $\alpha = 0.9$
- ✓ Find the value of  $\beta$  if  $\alpha = 0.98$
- ✓ Find the value of  $\beta$  if  $\alpha = 0.99$
- ✓ Calculate  $I_E$  in a transistor for which  $\beta = 50$  and  $I_B = 20\mu\text{A}$
- ✓ What is the name given to the semiconductor device that has three or more elements?
- ✓ In which direction does the arrow point on an npn transistor?
- ✓ In which direction does the arrow point on an pnp transistor?
- ✓ What is the name of the device that provides an increase in current, voltage, or power of a signal without appreciably altering the original signal?

#### Sample Questions:

**5 Marks**

- ✓ Obtain the relationship between  $\alpha_{dc}$  and  $\beta_{dc}$  in a transistor.
- ✓ Show that a transistor could be used as an amplifier.
- ✓ What is a transistor? Write the circuit symbol of NPN and PNP type of transistor?
- ✓ Explain with a neat sketch the three biasing region of the transistor.
- ✓ Draw the block diagram of an unbiased NPN transistor. Identify each part of the device and show the depletion regions and the barrier voltage.
- ✓ Sketch and explain the current components crossing each junction of a transistor biased in the active region.
- ✓ Obtain the expression for the collector current for a NPN or PNP transistor.
- ✓ Mention the application of a transistor and explain the transistor acts a switch.



## School of Engineering and Technology

### Sample Questions:

**10Marks**

- ✓ Describe in detail the working of a NPN bipolar junction transistor.
- ✓ Describe in detail the working of a PNP bipolar junction transistor.
- ✓ Draw a sketch to show the various current components in a NPN transistor and deduce the relation between various current components.
- ✓ A transistor is capable of providing amplification. Explain the basic transistor amplifier with suitable diagrams.
- ✓ Explain the input and output characteristics for a CE configuration. Discuss each region in detail.
- ✓ If the base current in a transistor is  $20\mu\text{A}$  when the emitter current is  $6.4\text{mA}$ , what are the values of  $\alpha$  and  $\beta$ ? Also calculate the collector current.
- ✓ Calculate  $\alpha_{dc}$  and  $\beta_{dc}$  for the transistor if  $I_c$  is measured as  $1\text{mA}$  and  $I_B$  is  $25\mu\text{A}$ . Also determine the new base current to give  $I_c = 5\text{mA}$ .
- ✓ Explain in detail the four basic feedback topologies. Mention the advantages and disadvantages of a Feedback Amplifier.
- ✓ Define positive and negative feedback? List four basic types of feedback? What are the advantages of negative feedback?
- ✓ Calculate  $I_c$  and  $I_E$  for a transistor that has  $\alpha_{dc} = 0.98$  and  $I_B = 100\mu\text{A}$ . Also determine the value of  $\beta_{dc}$  for the transistor.

**Note: Study only Common Emitter Configuration in transistor.**