18CSS201J - ANALOG AND DIGITAL ELECTRONICS

Assignment 1

Set 1

1. Explain the operation of PNP transistor
2. Calculate I_C and I_E for a transistor that has α_{dc}=0.98 and I_B=100μA. Find the value of β_{dc} of the transistor.
3. What is the various method used for transistor biasing. State their advantage and disadvantage.
4. Explain the operation of crystal oscillator with neat diagram
5. Explain the ideal operational amplifier.

Set 2

1. Explain the operation of NPN transistor
2. The current gain of a transistor in CE mode (β) is 49. Calculate its CB current gain (α). Also find the collector current when the emitter current is 3mA.
3. Explain the input and output characteristics of CB connection. What do you infer from the characteristics.
4. Explain the Class A amplifier with neat diagram.
5. Explain the UJT Relaxation Oscillator

Set 3

1. In a transistor, I_B = 68μA, I_E = 30mA and β = 440. Find the value of α. Hence the determine the value of I_C
2. Draw the symbols of NPN and PNP transistors and mention different transistor currents and voltages indicating the polarity.
3. Differentiate FET and BJT
4. Explain the op amp parameters.
5. Draw the neat diagram explain the CE configuration operating as an amplifier circuit.

Set 4

1. In a BJT, the emitter current is 12 mA and the emitter current is 1.02 times the collector current. Find the base current.
2. Define α , β and γ of a transistor and derive the relation between them.
3. What do you understand by transistor biasing? What is its need?
4. Explain the Class B amplifier with circuit diagram and waveform
5. Explain the inverting and non-inverting input of differential amplifier with neat circuit diagram.

Set 5

1. Why is collector region wider than emitter region in BJT?
2. The maximum collector current that a transistor can carry is 500mA. If $\beta = 300$ what is the maximum allowable base current for the device?
3. A non-inverting amplifier has an R_i of 1 kΩ and R_f of 100 kΩ. Determine V_f , feed-back factor if $V_{out} = 5V$
4. Explain the two application of operation amplifier.
5. Discuss the principles of negative voltage feedback in amplifier with a neat diagram