V.P. & R.P.T.P. SCIENCE COLLEGE
VALLABH VIDYANAGAR

Third Semester B.Sc. Internal Examination

Subject: **Physics** Course: **USO3CPHY02**

Date: 05 -10-2017, Thursday Time: 3:00pm to 4:30 pm Total Marks:25

Q: 1 Answer the following MCQs with correct option. Each of 1 mark. [3]

1. With a fixed bias circuit if collector current is more than collector saturation current then the operating point will be in ..... region.
   (a) cut-off (b) saturation (c) active (d) near cut-off.
2. Which of the following h-parameter represents 'feedback' of the output voltage to the input of a transistor?
   (a) h_{re} (b) h_{ie} (c) h_{fe} (d) h_{oe} .
3. For positive feedback, the phase difference between the feedback signal and input signal must be of ..... radian.
   (a) zero (b) π (c) 3π (d) $\pi/2$.

Q-2 Answer any Two in short. (Each of 2 Marks) [4]

1. Why operating point shifts? Explain thermal run away of the transistor.
2. For a transistor at a certain fixed collector voltage there is a change in collector current of 0.5 mA corresponding to a change in base current of 5 μA. Determine current amplification factor.
3. Draw block diagrams of systems using (i) series voltage feedback and (ii) shunt current feedback. State their features.

Q.3 What is an operating point? Explain selection of a proper operating point. [6]

OR

Q.3 What is Voltage divider biasing circuit? Explain determination of operating point of such circuit using approximate analysis with suitable example. [6]

Q.4 What are small signal amplifiers? Draw the circuit of such amplifier and discuss function of each component. Define gain of such amplifier. [6]

OR

Q.4 What are h parameters? Explain development of h-parameter equivalent circuit of a CE transistor. [6]

Q.5 What is a feedback? Explain various types of feedback and derive expression for voltage gain of a series voltage negative feedback amplifier. [6]

OR

Q.5 Compare negative feedback with positive feedback? Explain effect of negative feedback on (i) voltage gain and (ii) distortion of an amplifier. [6]

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