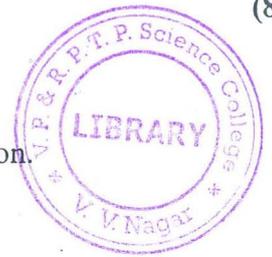


Q.1 Answer with the correct choice (1 Mark Each).**(8)**

- Positive clipping happens if the operating point is
 - near saturation region
 - near cut-off region
 - at middle of active region
 - in cut-off region.
- A good biasing circuit establishes the operating point on a load line region.
 - near saturation
 - near cut-off
 - at middle of active
 - outside active
- Which of the following h-parameter defines input impedance of a CE transistor?
 - h_{re}
 - h_{ie}
 - h_{fe}
 - h_{oe} .
- Which of the following h-parameter represents 'feedback' of the output voltage to the input of a transistor?
 - h_{re}
 - h_{ie}
 - h_{fe}
 - h_{oe} .
- Due to negative feedback, the bandwidth of an amplifier
 - increases
 - decreases
 - remains same
 - none of above.
- For negative feedback, phase difference between feedback signal and input signal must be ...
 - zero
 - π
 - 3π
 - $\pi/2$.
- For generating a signal of 400KHz, the most suitable circuit is Oscillator.
 - Hartley
 - Colpitts
 - tuned-collector
 - Wein-Bridge
- The crystal oscillator is more used because
 - it gives high output voltage
 - it works at high output voltage
 - the frequency of oscillations remains sustainly constant
 - it requires low dc supply.

**Q.2 Answer ANY FIVE of the following in short (2 Mark Each).****(10)**

- What is biasing circuit? State requirements of a good biasing circuit
- Why operating point shifts? Explain thermal run away of the transistor.
- Draw the labeled circuit of small signal amplifier.
- 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 μ A. Determine current amplification factor.
- Draw block diagram of system that uses series voltage and shunt current feedback. State their features.
- An amplifier with $Z_i = 1k\Omega$ has a voltage gain $A=1000$ and feedback factor $\beta = 1/10$. Calculate the input impedance of the feedback amplifier.
- Explain how a feedback network generates sustained oscillations?
- For a Colpitts oscillator with $L = 10$ mH and $C_1 = 10$ pF, $C_2 = 100$ pF, determine the frequency of oscillations.

Answer the following in detail.

- Q.3** Explain determination of operating point for fixed bias circuit with suitable example. State its limitations. **(8)**

OR

- Q.3** Explain determination of operating point of voltage divider biasing circuit using approximate analysis with proper example. **(8)**

- Q.4** State quantities that determine performance of voltage amplifier and explain Graphical method for amplifier analysis. **(8)**

OR

- Q.4** Explain h parameters and develop complete h-parameter (hybrid) equivalent circuit of transistor. **(8)**

- Q.5** State advantages of negative feedback and explain its effect on (a) gain and (b) input impedance. **(8)**

OR

- Q.5** Discuss types of feedback and derive expression for voltage gain of a feedback amplifier in terms of internal gain of the amplifier. **(8)**

- Q.6** Write note on: (i) Harley Oscillator and (ii) Colpitts Oscillator **(8)**

OR

- Q.6** Explain basic principle and working of a Wein bridge Oscillator with necessary diagrams. **(8)**