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Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2009

Computer Science Engineering

CS/IT 2K 304/PTCS 2K 107—BASICS ELECTRONICS ENGINEERING

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

1. (a) What is the difference between energy level and energy band ? Explain.

   (b) Why are diodes not operated in break-down region in rectifier service ? Discuss.

   (c) Why is the collector current slightly less than emitter current in the transistor ? Give its importance.

   (d) Mention the essentials of a biasing circuit. Write its significance.

   (e) Define the terms distortion and power dissipation capability in power amplifiers.

   (f) What is an oscillator ? What is its need ? Give its applications.

   (g) Draw the ideal voltage transfer characteristics of an Op-Amp and explain.

   (h) How an Op-Amp can be used as a comparator ? Explain.

   (8 × 5 = 40 marks)

2. (a) Explain the formation of potential barrier in a *p-n* junction, also discuss the behaviour of a *p-n* junction under forward and reverse biasing.

   Or

   (b) Draw and explain the input and output characteristics of CE connection and derive the expression $\beta = \frac{\alpha}{1-\alpha}$.

3. (a) Describe the potential divider method in detail. Explain how stabilization of operating point is achieved by this method.

   Or

   (b) Show that the output voltage of a single-stage common emitter transistor amplifier 180° out of phase with the input voltage.

4. (a) (i) Show that maximum collector efficiency of class A transformer coupled power amplifier is 50 %.

   (ii) A power transistor dissipates 4 W. If $T_{jmax} = 90°$ C., find the maximum ambient temperature at which it can be operated. Given θ = 10°C/W.

   Or

   (b) Explain with neat diagram the tuned collector oscillator.

5. (a) Draw and explain the working of Op-Amp circuit as integrator and differentiator.

Or

(b) Write short notes on :

(i) Precision diode. (8 marks)

(ii) Active filters. (7 marks)

[4 × 15 = 60 marks]