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16097(D) 20 DEC 2016

B. Tech 3rd Semester Examination

Analog Electronics (CBS)

EC-301

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Attempt five questions in all, select one question from each section A, B, C, D. Section E is compulsory.

(ii) Assume suitable data if necessary.

SECTION - A

1. (a) Explain the phenomena involved in the breakdown of a PN junction under reverse biased conditions. Distinguish between zener breakdown and avalanche breakdown. (5)

   (b) What is schottkey diode? Give its working, characteristics and applications. (5)

2. Why are the h parameters preferred to analyse a circuit using bipolar transistor? Draw a circuit of a CE transistor configuration and give its h parameters model. Also derive the expression for current gain, voltage gain, input impedance and output impedance. (10)

SECTION - B

3. (a) Explain the need for cascading amplifiers. What is its effect on bandwidth? (5)

   (b) Draw the circuit diagram of Darlington amplifier. Give its main characteristics, merits and applications. (5)

4. Draw the hybrid Π model of transistor. Derive an expression for high frequency current gain with resistive load for CE amplifier. (10)

SECTION - C

5. (a) What do you understand class A, class B, and class C power amplifier? (4)

   (b) Discuss transformer coupled class A power amplifier. Explain its working and find an expression for its efficiency. (6)

6. Draw the circuit diagram of single and double tuned amplifiers. Explain its working and discuss their frequency response. (10)

SECTION - D

7. Draw the circuit of voltage shunt feedback amplifier. Derive an expression for (i) gain with feedback (ii) input and output impedance with feedback. (10)

8. (a) Briefly discuss the use of LED and LCD as display device. Comment on their relative merits and demerits. (5)

   (b) Using diagrams explain the operation of optocouplers. Also discuss applications of optocouplers. (5)

SECTION - E

9. (i) What is the effect of temperature on reverse saturation current of a diode? (2)

   (ii) What are the main purpose for which a common collector amplifier may be used? (2)

   (iii) Why R-C coupling is the most widely used coupling between the two stages of a cascaded amplifier? (2)

   (iv) Why does R-C coupling give constant gain over mid frequency range? (2)

   (v) Why power amplifier are called large signal amplifier? (2)

   (vi) Comment on the maximum efficiency of class B operation. (1)

   (vii) What is the difference between tuned voltage amplifier and basic voltage amplifier? (2)

   (viii) What do you mean by feedback? Differentiate between positive feedback and negative feedback. (2)

   (ix) Define transistor transconductance(g_m). (2)

   (x) What is photodiode? (1)

   (xi) Differentiate between LED and OLEDs. (2)