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**Question Paper Code : 60446**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Third Semester

Electronics and Communication Engineering

EC 2205/EC 36/080290011 — ELECTRONIC CIRCUITS – I

(Common to Medical Electronics Engineering)

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the factors affecting the stability of Q point?
2. Define thermal runaway.
3. State Miller's theorem.
4. What is the significance of CMRR for a differential amplifier?
5. Draw a hybrid  $\pi$  common emitter transistor model.
6. The lower 3 dB frequency of an amplifier is 100 Hz and the gain in the mid frequency is 40. Calculate the gain of the amplifier at lower 3 dB frequency.
7. Mention the important features of power amplifier.
8. Justify, "The class C power amplifiers are not used as output stage of an audio frequency amplifier". Why?
9. State the importance of filter in a rectifier circuit.
10. What is the need for protection circuit in a voltage regulator?

PART B — (5 × 16 = 80 marks)

11. (a) Illustrate the effect of Q point close to different operating regions with appropriate diagram. (16)

Or

- (b) Draw and explain the bias circuit which uses diode to compensate for changes (i) in  $V_{BE}$  and (ii) in  $I_{CO}$ . (16)

12. (a) (i) For a common base amplifier with fixed bias, derive the expression for (1) voltage gain and (2) current gain. (12)
- (ii) Compare CB, CE and CC transistor amplifier configuration in terms of input resistance ( $R_i$ ), output resistance ( $R_o$ ), voltage gain ( $A_v$ ) and current gain ( $A_i$ ). (4)

Or

- (b) Discuss the method of Darlington connection to improve the input impedance of the emitter follower. (16)
13. (a) Draw an equivalent circuit of BJT at high frequency and derive the expression for upper cutoff frequency. (16)

Or

- (b) Discuss the high frequency analysis of FET amplifier with a neat diagram. (16)
14. (a) (i) Explain how does complementary symmetry amplifier overcome the drawbacks of class B push pull amplifier? (8)
- (ii) Derive an expression to prove that the maximum efficiency of class B amplifier is 78.5%. (8)

Or

- (b) With diagram and waveforms explain the operation of a transformer coupled class A power amplifier. (16)
15. (a) Discuss the operation of full wave rectifier with a neat circuit diagram and waveforms. Also mention its advantages and disadvantages. (12+4)

Or

- (b) Classify the different types of voltage regulator and explain any one type voltage regulator with a neat diagram. (16)