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**Question Paper Code : 91399**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Third Semester

Electronics and Communication Engineering

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

(Common to Medical Electronics Engineering)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Determine the value of  $R_B$  and  $R_C$  for a collector to base bias circuit for the specified condition:  $V_{CC} = 15V$ ,  $V_{CE} = 5V$ ,  $I_C = 5ma$  and  $\beta = 100$ .
2. What are the factors against which an amplifier needs to be stabilized?
3. List out the advantages of h parameters.
4. State the various methods of improving CMRR.
5. Define beta cut off frequency.
6. Define rise time. Give the relation between bandwidth and rise time.
7. Show that the even harmonics are cancelled at the output of a push pull class B ideal amplifier.
8. What is class S operation?
9. What is the output frequency of HWR and FWR when the input frequency is 60Hz?
10. A power supply has 4% voltage regulation and an open circuit voltage of 48V DC. Calculate the full-load voltage.

PART B — (5 × 16 = 80 marks)

11. (a) Design a voltage divider bias circuit for a silicon transistor for the specified conditions.  $V_{CC} = 12V$ ,  $V_{CE} = 6V$ ,  $I_C = 1mA$ ,  $S = 20$ ,  $\beta = 100$  and  $V_E = 1V$ . Determine the values of  $R_1$ ,  $R_2$ ,  $R_E$  and  $R_C$ . (16)

Or

- (b) (i) Draw the circuit of self biased CE amplifier using diode compensation for  $V_{BE}$  and  $I_{CO}$ . Also describe how bias compensation is achieved. (10)
- (ii) With neat diagram, explain the biasing circuit for an enhancement type MOSFET. (6)

12. (a) Draw the small signal equivalent circuit of CE configuration and determine its voltage gain, current gain, input impedance, output admittance, voltage gain with source, current gain with source and power gain. (16)

Or

- (b) (i) Draw and explain the emitter coupled differential amplifier circuit and obtain its dc analysis. (8)
- (ii) Draw the equivalent circuit of Darlington pair and determine the input impedance. Show that the input impedance of Darlington pair is more than the common collector amplifier. (8)
13. (a) Draw the high frequency pi model for a CE configuration and determine the high frequency current gain with short circuit and resistivity load. (16)

Or

- (b) (i) Derive the expression for overall lower and higher cut off frequency of multistage amplifier. (8)
- (ii) Explain the high frequency analysis of FET. (8)
14. (a) Draw and explain the working of class A transformer coupled audio power amplifier. Also derive its maximum efficiency. List the advantages and disadvantages. (16)

Or

- (b) (i) Explain in detail, the working of complementary symmetry class B type power amplifier with necessary diagram. (12)
- (ii) Write short notes on heat sink. (4)
15. (a) Draw the circuit diagram and explain the working of centre tapped FWR with LC filter. Derive expression for DC current and voltage, RMS current and voltage, efficiency and ripple factor without and with LC filter. (16)

Or

- (b) (i) Draw a neat diagram of a series regulator with foldback protection and explain its working. (8)
- (ii) Explain how AC power is controlled using SCR. (8)