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Reg. No. : | | | | | | |

T 3205

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Third Semester

(Regulation 2004)

Electronics and communication Engineering

EC 1203 — ELECTRONIC CIRCUITS — I

Ec 2005

(Common to B.E. (Part-Time) Second Semester, Regulation 2005)

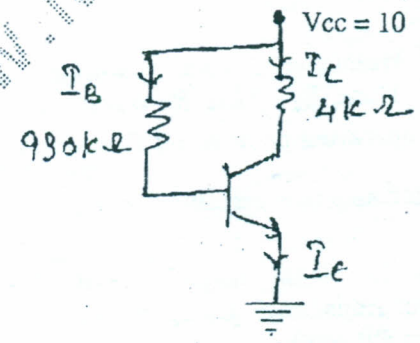
Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define three stability factors.

2. For the circuit shown in the figure, determine the operating point with $\beta = 100$.



3. State Millers theorem.

4. How does input impedance increase due to Darlington connection?

5. What is meant by Gain-Bandwidth product?

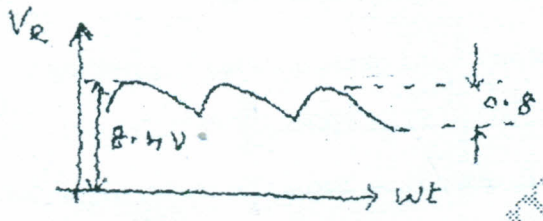
6. Give the equation of overall upper and lower cut off frequencies of multistage amplifier.

7. A class A CE amplifier operates from V_{cc} = 20 V draws a current I_{CQ} = 5 A and feeds a load of 40Ω through a step up transformer of $n_2/n_1 = 3.16$. Find the efficiency of the amplifier when it is properly matched for maximum power supply.

8. Define Heat sink.

9. What is a voltage multiplier.

10. Find the ripple factor for a FWR with capacitor filter with the output waveform as shown in the figure. Assume $R_L = 100\Omega$ with capacitor C = 1000 μF.



PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw and explain voltage divider bias using FET and derive for its stability factor. (10)

(ii) Determine the bias resistor R_B for fixed bias and collector to base bias and compare the stability factor S for both of them. Given V_{CC} = 12 V, R_L = 330Ω, I_B = 0.3 m A, β = 100 V_{CEQ} = 6V. (6)

Or

(b) (i) A silicon transistor uses voltage divider biasing $V_{cc} = 12V$, $R_1 = 10k\Omega$, $R_2 = 5k\Omega$, $R_L = 1k\Omega$ and $R_E = 3k\Omega$. Determine the operating point using Thevenin's theorem. (10)

(ii) Explain how FET acts as a variable resistor. (6)

12. (a) Draw the hybrid model of CE amplifier and obtain its gain, input impedance and output impedance. Compare the performance of this CE amplifier with CC and CB configuration. (16)

Or

(b) (i) Explain the operation of basic emitter coupled differential amplifier and derive its CMRR. (10)

(ii) How does the constant current source increase the gain and hence CMRR in a differential amplifier. (6)

13. (a) Derive for the upper and lower cut-off frequencies of a RC coupled BJT amplifier. (16)

Or

(b) Draw the high frequency equivalent circuit for a FET amplifier and derive the values of all the parameters. (16)

14. (a) (i) Discuss the complementary symmetry class B amplifier and obtain its efficiency (10)

(ii) Describe the operation of class AB amplifier to avoid cross over distortion. (6)

Or

(b) Explain the operation of Class C amplifier and derive its efficiency and figure of merit. (16)

15. (a) (i) Explain how zener diode acts as a regulator. (6)

(ii) Derive the ripple factor for FWR with capacitor filter. (10)

Or

(b) Draw and explain the working principle of a SMPS circuit with its output waveforms. (16)