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Question Paper Code : 21355

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Third Semester

Electronics and Communication Engineering

EC 2205/080290011/EC 36 — 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. Define the term biasing.

2. Write the conditions of thermal stability.

3. Draw the circuit diagram of Darlington type amplifier.

4. Give reason for the improvement of CMRR in the amplifiers.

5. What is meant by Miller effect?

6. How do you calculate the bandwidth of a signal?

7. Mention the significance of heat sink in power devices.

8. Define class-D amplifier.

9. Define ripple factor.

10. Draw the block diagram of a power supply.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive the stability factor for voltage divider bias. (8)

(ii) For the circuit in Figure–1, draw the AC load line and determine the maximum output swing without distortion. (8)

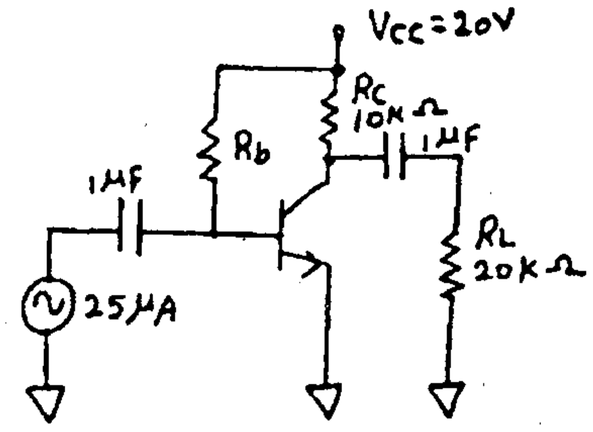

Figure –1

Or

(b) (i) Discuss the various stabilization techniques of Q – point in a transistor. (8)

(ii) Discuss in detail about the various bias compensation techniques.(8)

12. (a) (i) Compute the parameters of the circuit shown in Figure –2 with $\beta = 100$. (10)

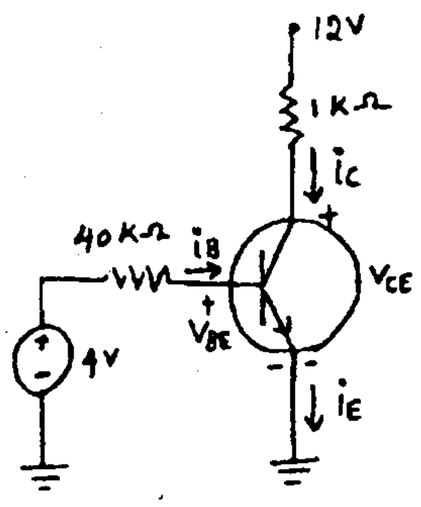

Figure –2

(ii) Explain in detail about the Miller's theorem. (6)

Or

(b) Compare CE, CB and CC transistor configurations.

(i) In terms of input impedance, output impedance, current gain and voltage gain. (10)

(ii) Draw the output characteristics of CE configuration and mark its regions of operation. (6)

13. (a) Determine the bandwidth of the amplifier shown in Figure –3. (16)

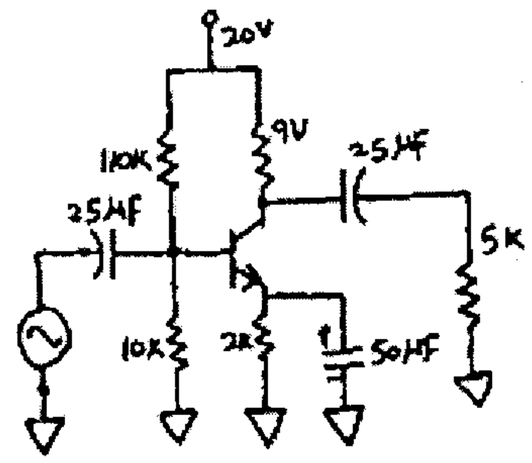

Figure -3

Or

(b) (i) Explain in detail about the calculation of overall upper and lower cutoff frequencies of multistage amplifiers. (8)

(ii) Draw the high frequency equivalent circuit of FETs and analyze in detail. (8)

14. (a) A class-B push-pull amplifier supplies power to a resistive load of 12 Ω. The output transformer has a turns of 3:1 and efficiency of 78.5% (16)

(i) Maximum power output

(ii) Maximum power dissipation in each transistor

(iii) Maximum base and collector current for each transistor Assume $h_{fe} = 25$ and $V_{cc} = 20$ V.

Or

(b) Explain in detail about the transformer – coupled class –A audio power amplifier and analyze its efficiency. (16)

15. (a) How is regulation of output voltage obtained against line and load variation in SMPS? (16)

Or

(b) (i) Explain the working of FWR with π filter. Derive its ripple factor. (8)

(ii) Describe in detail about the voltage multipliers. (8)