B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2001.

Third Semester

Electronics and Communication Engineering

EC 234 — ELECTRONIC CIRCUITS — I

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Draw the circuit of collector to base feedback biasing circuit.

2. Why is it necessary to stabilize the operating point of transistor?

3. Draw the small signal low frequency model for FET.

4. Mention any two applications of Boot-strapped amplifier.

5. What are the advantages of differential amplifier?

6. Which power amplifier gives minimum distortion and why?

7. Give the significance of coupling and bypass capacitor on band width of amplifiers.

8. How rise time and band width are inter-related?

9. Define ripple factor and transformer utilization factor.

10. Distinguish between shunt and series voltage regulator.

11. (i) Draw the circuit diagram of voltage divider bias using CE configuration and explain how it stabilizes the operating point. Derive the stability factor for it. (10)

(ii) Explain bias compensation using sensistors. (6)

12. (a) (i) Obtain an expression for current gain of CE amplifier with bypassed emitter resistor making use of exact hybrid model. (10)

(ii) Derive input and output impedances of FET amplifier with the help of small signal model. (6)

Or

(b) (i) What are the significances of cascode connection with the help of its equivalent circuit, derive A_I, A_V, R_i and R_o. (10)

(ii) Explain the method of measuring CMRR. (6)

13. (a) Describe with a neat circuit diagram, the working of push pull amplifier. Prove that its maximum theoretical efficiency is around 78.5%. (16)

Or

(b) (i) Draw the circuit of complementary/symmetry amplifier and explain its operation. Compare and contrast it with ordinary amplifier. (12)

(ii) How thermal stability is established in power amplifiers. (4)

14. (a) Discuss the frequency response characteristics of CE amplifier. Derive the general expression for gain at low, middle and high frequencies. Draw Bode plots for low and high frequency regions. (16)

Or

(b) Using Hybrid π model derive an expression for short circuit current gain. Define f_T. Draw Bode diagram for short circuit current gain as a function of frequency. (16)

15. (a) (i) With necessary circuit diagram, describe the working of full wave rectifier. (8)

(ii) For the circuit shown, calculate the efficiency of rectification, transformer utilization factor and ripple factor. (8)
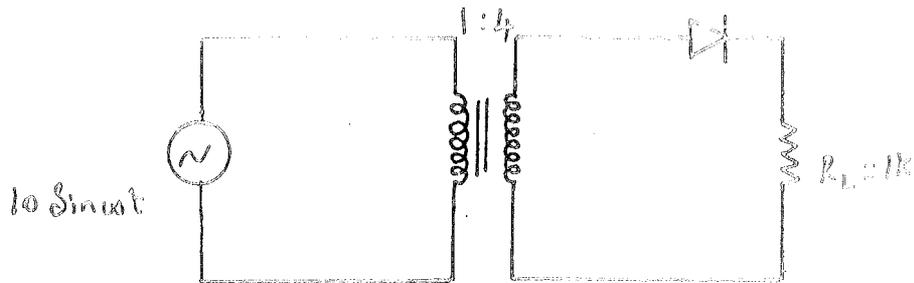
Or

(b) (i) Describe the design features to get regulated DC voltage from unregulated AC supply. (10)

(ii) Explain the following terms : (6)

(1) Input regulation factor

(2) Output resistance

(3) Temperature coefficient.