C 3174

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Second Semester

Mechatronics Engineering

EC 1161 — ELECTRONIC DEVICES AND CIRCUITS

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Superposition theorem.

2. Convert Y parameters to ABCD parameters.

3. What is a Zener diode?

4. Name different types of biasing circuits.

5. What are the advantages of bridge rectifier as compared to full wave centre tapped rectifier?

6. What are the disadvantages of zener shunt regulator?

7. Discuss the merits and limitations of common base amplifier.

8. Mention the factors upon which the *h* parameters depend.

9. State the ideal op-amp characteristics.

10. Mention the conditions for sustained oscillations.

PART B — (5 × 16 = 80 marks)

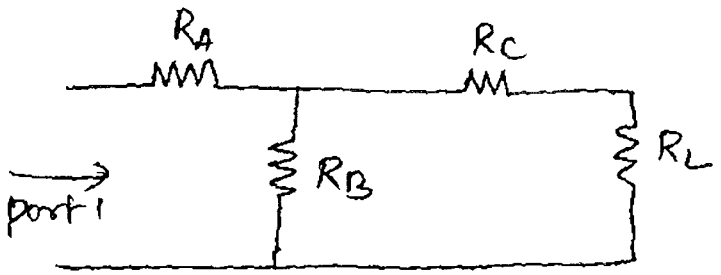
11. (a) State and explain the following network theorems.

(i) Thevenin's theorem (8)

(ii) Norton's theorem. (8)

Or

(b) (i) Find the Z parameters for the two port network given. (10)



(ii) State Super position theorem. (6)

12. (a) Explain the following terms : (16)

(i) Static resistance

(ii) Bulk resistance

(iii) Junction resistance

(iv) a.c. (or) dynamic resistance

(v) Reverse resistance of a diode.

Or

(b) (i) Explain the working of a JFET (junction field-transistor). (7)

(ii) Draw the V-I characteristics of an N-channel JFET. (5)

(iii) Define dynamic drain resistance (r_d) and amplification factor (μ) for a JFET. (4)

13. (a) (i) Draw circuit diagram of transistor shunt regulator. Explain it briefly. (11)

(ii) What are the disadvantages of Zener shunt regulator? (5)

Or

(b) Explain the working of positive and negative clipper. (16)

14. (a) (i) Explain briefly how the oscillations are maintained in a Hartley oscillator. (12)

(ii) Give the two Barkhausen conditions required for sinusoidal oscillations to be sustained. (4)

Or

(b) Draw the equivalent circuit of a common emitter amplifier in terms of h parameters and obtain the expression for voltage gain. (16)

15. (a) (i) List the ideal characteristics of op-amp. (6)

(ii) Explain the operation of a Wienbridge oscillator. (10)

Or

(b) Explain the operation of monostable multivibrator using 741 C. (16)
