

D 4511

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

Annual Pattern — First Year

Mechatronics Engineering

EC 1X12 — ELECTRONIC DEVICES AND CIRCUITS

(Regulation 2004)

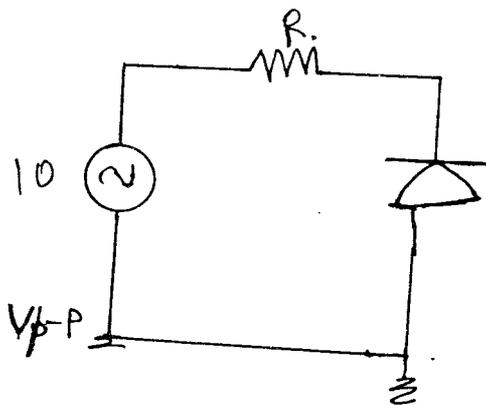
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Thevenin's theorem.
2. Draw a h -parameter model for a two-port network.
3. Distinguish between Zener breakdown and avalanche breakdown.
4. Draw the output characteristics of a MOSFET and mark its regions of operation.
5. Draw the input and output waveforms of the circuit shown.



6. Define Peak inverse voltage of a rectifier.
7. What are the advantages of Feedback amplifier (any three)?

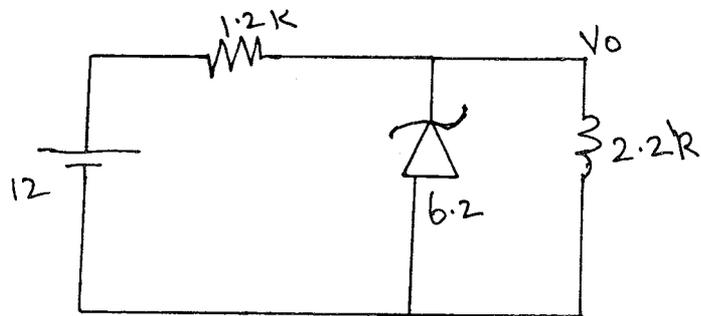
8. Draw the frequency response of CE amplifier.
9. Define Monostable operation of a multivibrator.
10. Mention ideal characteristics of operational amplifier.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Give the energy band diagram of conductors, insulators and semiconductors. (6)
- (ii) Explain the output characteristics of BJT in CE configuration. (10)

Or

- (b) (i) Why biasing is needed for Amplifiers? (4)
 - (ii) With circuit diagrams explain fixed Bias collector feedback bias and self bias used in BJT Amplifiers. (12)
12. (a) (i) Compare HWR and FWR with respect to PIV, ripple factor and ripple frequency. (6)
 - (ii) Explain the action of clipper circuit and a clamper circuit with an example. (6)
 - (iii) Find out the zener current. (4)



Or

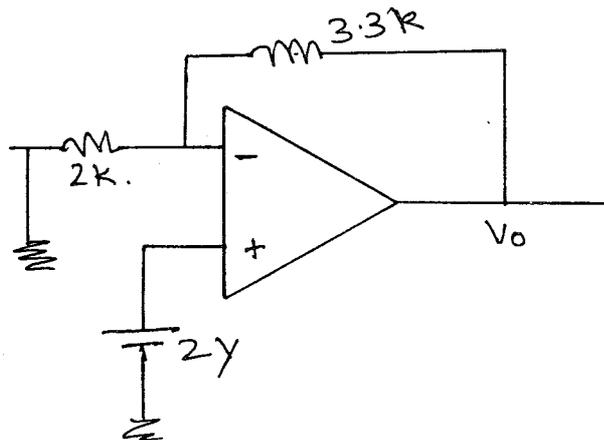
- (b) (i) Describe regulation of output voltage with respect to load and line variations in a voltage regulator. (10)
- (ii) Illustrate voltage multiplication with a circuit. (6)

- (a) (i) Draw a CE amplifier circuit and explain the significance of each component in the circuit. (12)
- (ii) Draw the frequency response of CE amplifier and explain why gain drops at high frequency. (4)

Or

- (b) (i) What are the different types of negative feedback topologies? (4)
- (ii) What are Barkhausen conditions in oscillators? (4)
- (iii) Draw a colpitt oscillator and explain its working. Also write the need of every component in the circuit. Write the expression for frequency of oscillation. (8)

14. (a) (i) Determine the output voltage of the circuit. (4)



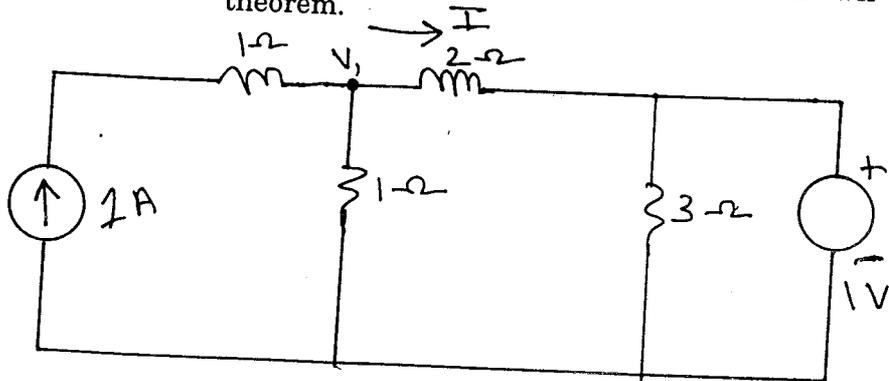
- (ii) Describe the working of the comparator and Schmitt trigger using OP-Amp with circuit diagram. (8)
- (iii) Derive the gain of inverting Amplifier using OP-Amp. (4)

Or

- (b) (i) Draw an Astable Multivibrator circuit and explain its working. Draw its output waveforms. (8)
- (ii) With the circuit of Weinbridge oscillator explain its working. Draw its output waveform. How the conditions for oscillation are satisfied? (8)

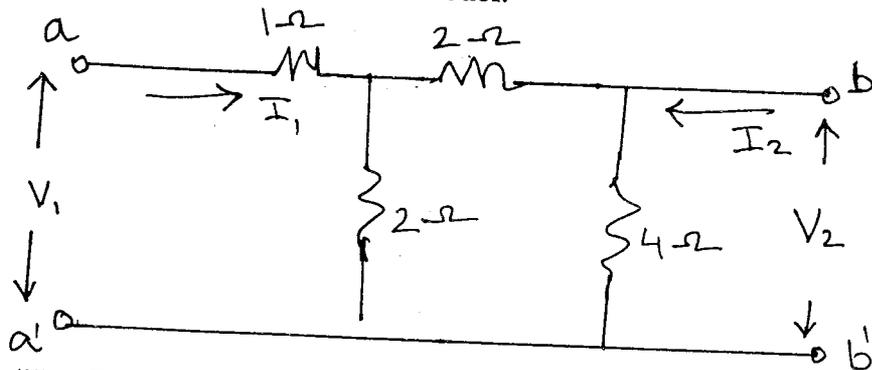
15. (a) (i) Define Superposition theorem. List the steps for solving a network using the principle of superposition. (6)

(ii) Find the current I and V_1 in the circuit shown using superposition theorem. (10)



Or

(b) (i) Find the Y parameters for the network shown in the figure. Also draw the Y parameter model. (10)



(ii) Find the transmission circuit parameters for the circuit shown. (6)

