

Reg. No. :

**T 3911**

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

Annual Pattern – First Year

Mechatronics Engineering

EC 1X12 – ELECTRONICS DEVICES AND CIRCUIT

(Regulation 2004)

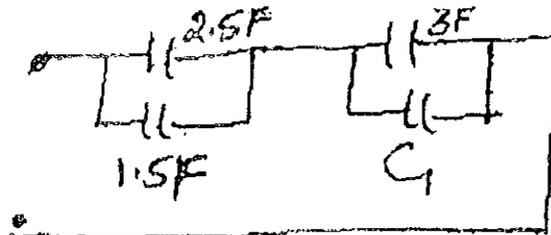
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Kirchoff's current law.
2. Find the value of  $C_1$  so that equivalent capacitance  $C = 2F$  in the following diagram.



3. Draw the energy band diagram of Intrinsic and extrinsic semiconductors.
4. What is the advantage of collector feed back bias over fixed bias?
5. Briefly explain a series clipper circuit.
6. Define barkhausen conditions for oscillation.
7. Write any two advantages of feed back amplifiers.

8. Differentiate between monostable and bistable function of multivibrators.
9. How OP-AMP is used as comparator?
10. What is meant by line and load regulation?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the transfer and output characteristics of MOSFET. (10)
- (ii) Explain selbiasing of a transistor. (6)

Or

- (b) (i) Compare CE, CB and CC configurations of BJT with respect to gain, input and output impedances. (8)
  - (ii) With structural diagram of PN junction, explain the function of the PN junction diode under forward and reverse bias with its V-I characteristics. (8)
12. (a) (i) Briefly describe the operation of FWR with circuit diagram and output waveforms. (8)
  - (ii) Compare FWR and HWR. (8)

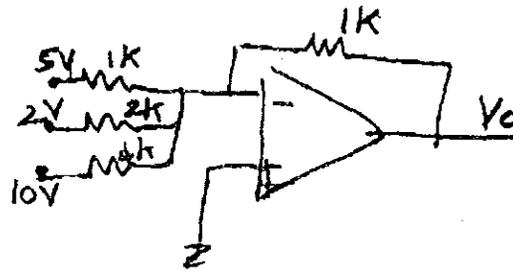
Or

- (b) (i) Describe the line and load regulations of zener regulator. (12)
  - (ii) With circuit diagram of voltage multiplier explain its functions. (4)
13. (a) (i) Draw h parameter model of a transistor in CE configuration. (6)
  - (ii) With circuit of colpitt oscillator explain its working. (10)

Or

- (b) (i) What are the different types of negative feedback and compare them with respect to basic amplifier, Input and Output impedance with feedback. (12)
- (ii) Draw the circuit of CE amplifier. (4)

14. (a) (i) Find the output voltage of circuit shown. (8)



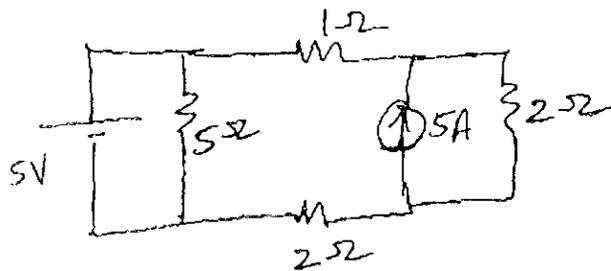
- (ii) Derive the gain of Noninverting Amplifier using OP-AMP. (8)

Or

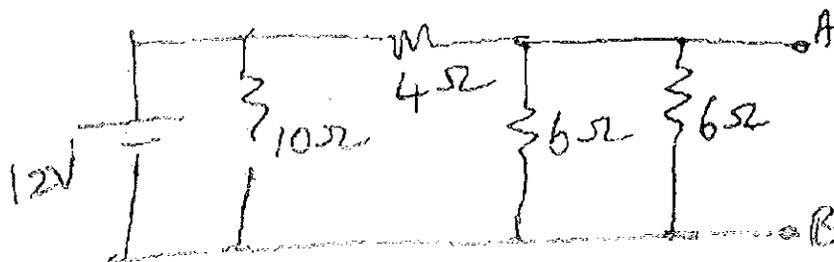
- (b) (i) Explain the function of monostable multivibrator with neat circuit. (10)

- (ii) Design a wein bridge oscillator to produce 5KHz sine wave using OP-AMP. Draw the designed circuit. (6)

15. (a) (i) Find the current through one Ohm resistance using super position theorem in the circuit shown. (8)

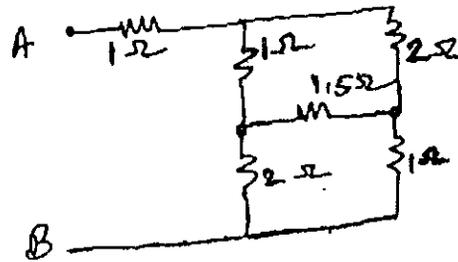


- (ii) Determine the Thevenin's equivalent for the circuit shown at terminals AB. (8)



Or

- (b) (i) Using Star - Delta transformation equation determine the equivalent resistance between points A and B. (10)



- (ii) Calculate the voltage of node 'n' with reference to ground. Deduce the current in 4 Ω resistance. (6)

