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G 1203

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Second Semester

Mechatronics Engineering

EC 153 — ELECTRONIC DEVICES AND CIRCUITS

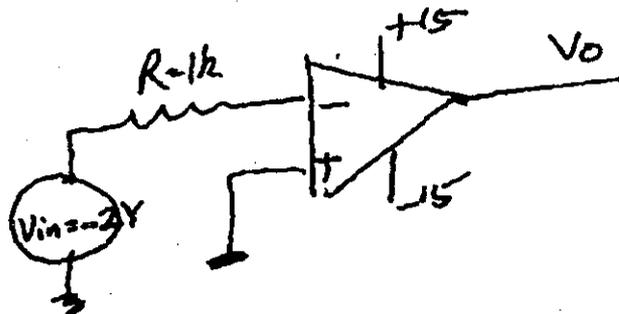
Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Drift current.
2. What is meant by Intrinsic semiconductor?
3. Why is biasing needed in Transistor?
4. What are the different types of feed back employed in amplifier.
5. Define CMRR.
6. What is the output of the circuit shown



7. How are oscillators classified?

8. Draw h-parameter model of a Bipolar transistor.
9. What is meant by Monostable mode of operation?
10. Draw the circuit of complementary collector coupled astable multivibrator.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat block diagram explain 555 Timer in astable mode of operation. Draw the output waveform.

Or

- (b) (i) Describe the function of Schmitt trigger circuit. (10)
- (ii) Define rise time, storage time and recovery time. (6)
12. (a) (i) How is Op-Amp used as Integrator? Derive expression for its output. (8)
- (ii) Explain the application of Op-Amp as differentiation amplifier and derive expression for its output. (8)

Or

- (b) (i) How can Op-Amp be used as instrumentation amplifier? (12)
- (ii) Mention the ideal characteristics of Op-Amp. (4)
13. (a) Define Barkhausen criterion for oscillation. Describe any one type of oscillator with circuit diagram.

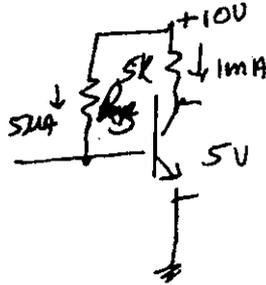
Or

- (b) (i) What are the advantages of negative feedback in amplifiers. (6)
- (ii) How is gain of amplifier stabilised in feedback amplifiers? (4)
- (iii) Draw topological diagram for four types of feedback. (6)
14. (a) Draw a CE amplifier and its small signal model. Derive expressions for voltage gain, current gain, Input gain and output impedances.

Or

(b) (i) Why bandwidth of CB amplifier is larger than that of CE amplifier. (5)

(ii) For the Circuit shown, draw the dc load line. (5)



(iii) How will you bias the transistor to work as

(1) Amplifier

(2) Switch. (6)

15. (a) (i) Define and write expression for diffusion current. (6)

(ii) Draw the structural diagram of BST and explain its output characteristics. Mark all three regions of operations in it. (10)

Or

(b) (i) Define Conductor, Semiconductor and Insulator with energy diagram. (6)

(ii) Explain the operation of PN junction diode under forward bias and reverse bias condition. (10)
