N 1155

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2004.

Fourth Semester

Electrical and Electronics Engineering

EC 254 — ELECTRONIC CIRCUITS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention typical values of all the four parameters of a CE amplifier.

2. Mention the two main advantages of Darlington pair.

3. What is the need for differential amplifier?

4. Draw the circuit diagram of a chopper stabilized amplifier.

5. Compare the impedance levels of a voltage series feedback amplifier before and after feedback.

6. What is Piezoelectric effect?

7. Draw one circuit for each of the biased clippers.

8. Compare the trigger requirements of the three types of multivibrators.

9. What are the advantages of bridge rectifier over its center tapped counterpart?

10. Define Line regulation and Load regulation.

PART B — (5 × 16 = 80 marks)

11. (i) A system needs to be powered with a 9 V DC source of maximum load current 100 mA. Design a circuit to supply power with the available domestic AC line. Assume any data required, but reasonably. Provide Short Circuit Protection. (10)

(ii) Design a SIMPLE zener regulator to give a DC fixed output of 5 V upto a load current of 50 mA. Draw its line and load regulation curves. (6)

12. (a) Derive the expression for the voltage gain of

    (i) Common Source amplifier

    (8)

    (ii) Common Drain amplifier configurations

    (8)

    under small signal low frequency conditions.

Or

(b) Draw the frequency response curve of a single stage RC coupled amplifier and explain the reasons for its different slopes. What is the curve of an ideal response?

    (16)

13. (a) Draw the circuit diagram of a basic differential amplifier. Explain its operation. What modification is carried out to increase its CMRR?

Draw the transfer characteristics of a differential amplifier with a differential voltage of 100. On the same graph draw the curve for a gain of 10,000. Comment.

    (16)

Or

(b) Draw the circuit diagram of a single tuned amplifier and explain its operation. What other tunings are practically applied and draw circuit for each one of them? What improvements are achieved as a result? (16)

14. (a) Draw one practical circuit each for

    (i) voltage series feedback

    (ii) voltage shunt feedback

    (4)

    and justify

    (4)

Explain how do the impedance levels get modify.

    (8)

Or

(b) Draw the circuit diagram of an oscillator which produces audio frequencies using a two stage amplifier. Explain its operation. Derive expression for its frequency of oscillations.

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(a) Explain the behaviour of a passive :

    (i)   integrator   (6)

    (ii) differentiator   (6)

    for a square input and show the output waveforms.   (4)

Or

(b) (i) Draw the circuit diagram of a Bipolar Junction Transistor based monostable multivibrator.   (4)

    (ii) Explain its operation.   (7)

    (iii) Derive the expression for its time period.   (5)

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