

B 313

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

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. In the Collector -- to -- base biasing why is the resistor between the collector and base split into two parts.
2. Draw a circuit that minimizes change in V_{BE} due to temperature variation.
3. What is the need for differential amplifier?
4. Draw the circuit diagram of a chopper stabilized amplifier.
5. Determine the voltage gain of a negative feedback amplifier whose open loop gain is -150 and 7% of the output is 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 is transformer utilization factor? Mention the circuit which has the best value. 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) Prove that self bias is better bias compared to collector to base bias. (8)
- (ii) Design a fixed bias circuit to have operating point of (10 V, 3 mA). The circuit is supplied with 20 V and uses a silicon transistor of h_{fe} 250. (8)

12. (a) Derive the expression for the differential and average voltage gain of a dual input dual output differential amplifier and explain the modification done to improve its CMRR. (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)
13. (a) (i) Draw one practical circuit each for
- (1) Voltage series feedback (4)
 - (2) Voltage shunt feedback. (4)
- and justify.
- (ii) Explain how the impedance levels get modified. (8)

Or

- (b) (i) Draw the circuit diagram of an oscillator which produces audio frequencies using a two stage amplifier. (4)
- (ii) Explain its operation. (4)
- (iii) Derive expression for its frequency of oscillations. (8)
14. (a) Explain the behaviour of a passive
- (i) Integrator (6)
 - (ii) Differentiator. (6)
 - (iii) For a square input and show the output waveforms. (4)

Or

- (b) (i) Draw the circuit diagram of a collector coupled monostable multivibrator. (4)
- (ii) Explain its operation. (7)
- (iii) Derive the expression for its time period. (5)

15. (a) (i) Name the circuit shown in Fig. 15 (a) (i). (2)

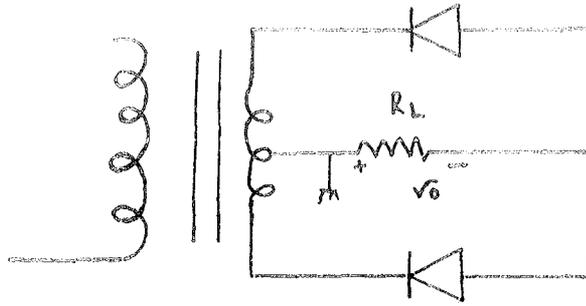


Fig. 15 (a) (i)

- (ii) Draw the output waveform expected across R_L . (2)
- (iii) What are the changes to be carried out to get the output inverted? (1)
- (iv) Is there any other circuit which could be used to get inverted output relatively easily? If so, draw the circuit and explain its operation. Draw the waveform at the output before and after inversion. (11)

Or

- (b) Draw the block diagram of SMPS and explain its operation. What are its advantages? (16)