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B 2157

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Fourth Semester

Computer Science and Engineering

EC 250 — ELECTRONIC CIRCUITS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of FET when compare to BJT?
2. In a transistor if $I_c = 4.9\text{mA}$ and $I_e = 5\text{mA}$, what is the value of α ?
3. The voltage gain of an amplifier without feedback is 3000. Calculate the voltage gain of the amplifier if negative voltage feedback is introduced in the circuit. Given that the feedback fraction $m_v = 0.01$
4. Explain how there is a phase reversal in the basic amplifier.
5. Define CMRR of the operational amplifier.
6. What is the advantage of MOS amplifier?
7. Define Barkhausen criteria.
8. What is the limitation of LC and RC oscillator?
9. Give the transfer function for the Butterworth approximation.
10. Draw the sample and hold circuit.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain in detail the steps involved in the process of IC fabrication. (12)
(ii) Differentiate between avalanche and zener breakdown. (4)

Or

- (b) (i) Explain the input and output characteristics of bipolar junction transistors in CE configuration. (8)
(ii) Explain the operation of a JFET. (8)
12. (a) (i) Derive the gain of the negative voltage feedback amplifier and derive its input and output resistance. (8)
(ii) Explain the operation of the emitter follower circuit. (8)

Or

- (b) (i) Explain the operation of class C amplifier and give its application. (8)
(ii) Draw the equivalent DC and AC equivalent of the transistor amplifier and analyze its performance. (8)
13. (a) (i) Using op-amp design a summer circuit and explain its operation. (8)
(ii) Explain the ideal characteristics of basic operational amplifier. (8)

Or

- (b) (i) What are the advantages and characteristics of MOS operational amplifier? (8)
(ii) Draw the block diagram of the BIFET op-amp and explain its ideal characteristics. (8)
14. (a) (i) Explain an astable multivibrator with its timing diagram (8)
(ii) Explain the Colpitts oscillator circuit with its design equation. (8)

Or

- (b) (i) Using IC 555 timers explain the design and working of pulse width modulation. (8)
(ii) Explain the working of Schmitt trigger with its hysteresis curve. (8)

15. (a) (i) Design an R-2R ladder type digital to analog convertor and explain with an example. (8)
- (ii) Explain the working principle of an analog multiplexer. (8)

Or

- (b) (i) Draw the differentiator circuit using op amp and explain its operation. (8)
- (ii) Using Chebyshev approximation design a high pass filter. (8)
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