

**Q.2** a. Explain with diagrams, the fabrication process of a typical circuit. (12)

**Answer:** Refer pages 13 to 16 of Text Book-II

b. Write the advantages of ICs over discrete circuits. (4)

**Answer:** Refer page 4 of Text Book-II

**Q.3** a. Draw the circuit of transistor common emitter amplifier with coupling and bypass capacitors and draw its h-parameter equivalent circuit and derive the expression for:

- (i) Input Impedance (ii) Output Impedance  
(iii) Voltage gain (iv) Current gain (12)

**Answer:** Refer pages 254 to 257 of Text Book-I

b. Define h-parameters. (4)

**Answer:** Refer pages 249 to 251 of Text Book-I

**Q.4** a. Explain the process of amplification using FET. (8)

**Answer:** Refer pages 364 to 365 of Text Book-I

b. Explain constructional features and working of Enhancement type MOSFET. (8)

**Answer:** Refer pages 367 to 368 of Text Book-I

**Q.5** a. Explain the working of class B amplifier and show that its maximum collector efficiency is 78.5%. (10)

**Answer:** Refer pages 815 to 816 of Text Book-I

b. Explain the working of phototransistor? (6)

**Answer:** Refer pages 967 to 968 of Text Book-I

**Q.6** a. What is slew rate of an op-amp and derive an expression for  $f_{max}$  (maximum input frequency at which undistorted output is obtained) (8)

**Answer:** Refer pages 123 to 125 of Text Book-II

b. Draw the voltage follower circuit and write its use. (4)

**Answer:** Refer page 49 of Text Book-II

c. Design an amplifier with a gain of +5V using one op-amp. (4)

**Answer:** Refer page 49 of Text Book-II

- Q.7** a. Draw the circuit of Non-inverting summing amplifier for 2 inputs using an op-amp and derive the expression for its output voltage. (8)

**Answer:** Refer page 137 of Text Book-II

- b. Draw the circuit of Practical Differentiator and derive the expression for its output voltage. (8)

**Answer:** Refer pages 164 to 165 of Text Book-II

- Q.8** a. Explain the working of Square Wave Generator using op-amp and derive the expression for its time period (T). (8)

**Answer:** Refer pages 216 to 217 of Text Book-II

- b. Draw the functional block diagram of 555 IC and explain. (8)

**Answer:** Refer pages 311 to 312 of Text Book-II

**Q.9** (For Current Scheme students i.e. DE56)

- a. What is meant by a voltage regulator? Draw the block diagram of a regulated power supply and explain the function of its various components. (8)

**Answer:** Refer pages 240 to 241 of Text Book-II

- b. Explain the parallel comparator A to D converter with the help of suitable diagram and give its applications. (8)

**Answer:** Refer pages 358 to 359 of Text Book-II

**Q.9** (For New Scheme students i.e. DE106)

- a. Explain how a solar cell differs from a photodiode. Sketch the typical solar cell characteristics and explain. (8)

**Answer:** Refer pages 964 to 965 of Text Book-I

- b. Draw the functional diagram of the successive approximation A to D converter and explain its operation. (8)

**Answer:** Refer pages 36 to 363 of Text Book-I

### TEXT BOOK

1. Basic Electrical Engineering, D.P. Kothari and I. J. Nagrath, Tata McGraw-Hill Publishing Company Limited, 2nd Edition, 13th Reprint 2006