

(3 Hours)

[Total Marks: 80]



- N.B.: (1) Question No. 1 is compulsory.
 (2) Solve any three questions from the remaining five.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data if necessary and mention the same in answer sheet.

Q.1 Attempt any 4 questions:

- (a) How precision rectifiers are different than simple diode rectifiers? [05]
 (b) Compare ideal op-amp with practical op-amp. [05]
 (c) Find v_N , v_P , and v_O in the circuit of Fig. 1(c) if v_S is 9 V. [05]

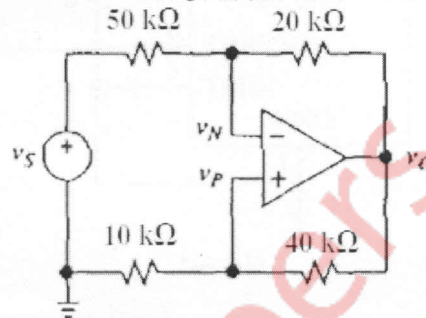


Fig. 1(c)

- (d) Design a circuit for $V_O = 2V_1 - 3V_2$ using single op-amp and few resistors. [05]
 (e) Explain how a resistor can be simulated by a switch capacitor circuit. [05]
- Q.2 (a) Design a voltage regulator using IC 723 to give $V_o = 4$ V to 32 V and output current of 2 A. [10]
 (b) Explain R-2R ladder type digital to analog convertor. [10]
- Q.3 (a) Explain analog to digital conversion using successive approximation method. [10]
 (b) Draw a neat circuit diagram of a RC phase shift oscillator using op-amp. Derive its frequency of oscillation. What are the values of R and C for frequency of oscillation to be 1 kHz? [10]
- Q.4 (a) What is an instrumentation amplifier? Draw a neat circuit of an instrumentation amplifier using 3 op-amps. Derive its output voltage equation. [10]
 (b) With the help of a neat diagram and voltage transfer characteristics explain the working of an inverting Schmitt trigger. Derive the expressions for its threshold levels. [10]
- Q.5 (a) Draw the circuit diagram of a square and triangular waveform generator using op-amp and explain its working with the help of waveforms. [10]

- (b) Analyze the circuit given in Fig. 5(b). Draw the waveforms at output terminal v_O and across the capacitor C . Comment on the duty cycle of output waveform. Take diode D as an ideal diode and assume R_A is equal to R_B . [10]

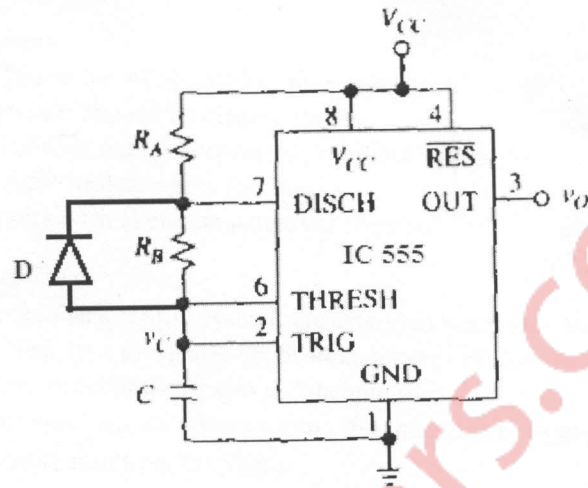


Fig. 5(b)

Q.6

Short notes on: (Attempt any four)

- Sample and hold circuit.
- Three terminal fixed voltage regulator.
- Monolithic switching regulator.
- XR2206 waveform generator.
- Wilson current source.

[05]
[05]
[05]
[05]
[05]
