

CBCS SCHEME



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18MT35

Third Semester B.E. Degree Examination, July/August 2022 Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Analyze the clipper circuit given in below Fig.Q1(a) and plot output waveform and transfer characteristics.

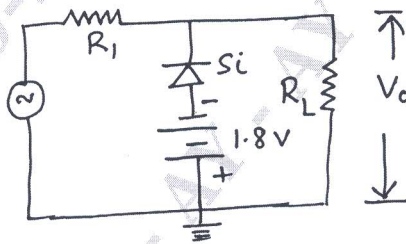


Fig.Q1(a)

The input is a sine wave varying between +10V and -10V and diode used in the circuit is silicon diode. (06 Marks)

- b. Draw circuit of wide band-pass filter and explain its operation. (08 Marks)
 c. Derive the gain magnitude and phase angle equations of lowpass filter (First order). (06 Marks)

OR

- 2 a. Analyze the circuit given below and plot output waveform. Input $V_i = 8 \sin \omega t$ and consider diode as ideal diode. Explain operation of the circuit. [Refer Fig Q2(a)]

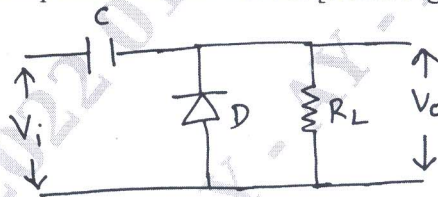


Fig Q2(a)

(06 Marks)

- b. Draw circuit diagram of all pass filter and explain its operation with necessary equations. (08 Marks)
 c. Analyze the circuit and plot output waveform and transfer characteristics. $V_i = V_m \sin \omega t$ and consider diode as ideal diode. [Refer Fig Q2(c)]

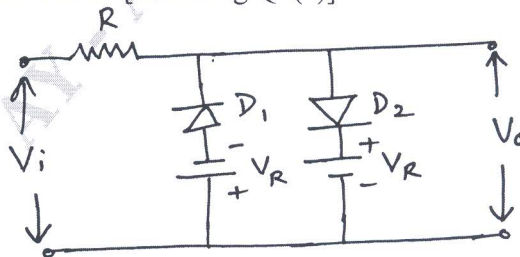


Fig Q2(c)

(06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-2

- 3 a. What is a Oscillator? Explain basic principle of an oscillator. (06 Marks)
 b. Draw Schmitt Trigger circuit using OP-Amp and explain its operation. (08 Marks)
 c. Explain phase shift oscillator with a neat circuit diagram. (06 Marks)

OR

- 4 a. What is frequency stability? Explain its significance. (06 Marks)
 b. Draw a neat circuit diagram of wein bridge oscillator and explain its working. (08 Marks)
 c. Explain noninverting comparator with a neat circuit diagram and waveform. (06 Marks)

Module-3

- 5 a. Draw block diagram of 555 timer and explain various pins of the 555 timer. (10 Marks)
 b. With a neat functional block diagram and waveform, explain the working of astable multivibrator using 555 timers. Derive the expression for output frequency. (10 Marks)

OR

- 6 a. Explain Monostable Multivibrator using 555 timer with a neat block diagram and waveform. (10 Marks)
 b. Explain the following applications of 555 timer Astable multivibrator.
 i) Square wave generator ii) Free – running ramp generator. (10 Marks)

Module-4

- 7 a. Simplify the Boolean function using K map $F(A, B, C) = A'C + A'B + A'BC + BC$ and draw logic diagram using basic gates. (06 Marks)
 b. Derive Boolean expressions for sum and carry of full adder and implement full adder using two half adders. (08 Marks)
 c. Implement Boolean function $F(A, B, C, D) = \Sigma(0, 1, 3, 4, 8, 9, 15)$ using 8×1 multiplexer. (06 Marks)

OR

- 8 a. What is an encoder? Explain octal to binary encoder using truth table and logic diagram. (06 Marks)
 b. Implement Full subtractor using 3×8 decoder. (08 Marks)
 c. Draw logic diagram of Quadruple 2 – to – 1 line multiplexers and explain its functioning. (06 Marks)

Module-5

- 9 a. Draw SR latch circuit using NOR gates and explain its functioning using truth table. (06 Marks)
 b. Explain BCD ripple counter with the help of logic diagram and timing diagram. (08 Marks)
 c. Explain T Flip Flop with the help of logic diagram and obtain its characteristic equation. (06 Marks)

OR

- 10 a. Draw logic diagram of JK Flip Flop and explain its operation. Also obtain its characteristic equation. (06 Marks)
 b. Explain 4-bit up-down binary counter. (08 Marks)
 c. What is Counter? Distinguish between synchronous and ripple counter. Briefly explain 3 bit ripple counter. (06 Marks)
