



Third Semester B.E. Degree Examination, Dec.2019/Jan.2020
Analog and Digital Electronics

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the operation of p-n junction diode under different biasing conditions with necessary diagrams. (08 Marks)
- b. Explain Small Signal Diode model and different types of capacitive effects associated with it. (08 Marks)

OR

- 2 a. In the full wave 2-diode rectifier $V_i = 10V$ (rms). The sum of the dc resistance of the transformer winding and the forward dc resistance of the diode is $R_s = 0.2\Omega$. The load resistance $R_L = 10\Omega$. The forward diode drop $V_D = 0.7V$. Find (i) The peak load current (ii) The dc load current (iii) Peak inverse voltage across the diodes (iv) The dc output voltage. (08 Marks)
- b. Explain how zener diode can be used as Voltage Regulator. (08 Marks)

Module-2

- 3 a. Explain the operation of a first order lowpass Butterworth filter and also draw its frequency response. (08 Marks)
- b. Explain the operation of wide Band-pass filter with necessary circuit diagrams and also draw its frequency response. (08 Marks)

OR

- 4 a. Explain the operation of RC phase shift oscillator with necessary diagrams and draw the output waveform. (08 Marks)
- b. Explain Wein bridge oscillator with necessary circuit diagram and design a Wein bridge oscillator for a frequency of $f_0 = 965$ Hz [Use standard values of R and C]. Gain $A_v = 3$. (08 Marks)

Module-3

- 5 a. With the help of circuit diagram explain op-amp as a basic comparator and zero crossing detector. (08 Marks)
- b. Explain the operation of a inverting Schmitt trigger. Draw its input and output waveforms. (08 Marks)

OR

- 6 a. Explain the operation of a monostable multivibrator and its applications. Draw its input output waveforms. (08 Marks)
- b. Explain the operation of 555 timer as a Astable multivibrator with circuit diagram and its applications. (08 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-4

- 7 a. Implement Ex-NOR using NAND and NOR gates. (06 Marks)
b. Draw and explain CMOS NOR and CMOS NAND gate operations. (05 Marks)
c. Explain the Emitter-coupled logic circuits. (05 Marks)

OR

- 8 a. Explain the operation of D-Flip-flop and T-Flip-flop with diagram using truth table. (08 Marks)
b. Explain the operation of J-K Flip-flop and explain how can we overcome race-around condition. (08 Marks)

Module-5

- 9 a. Realize 3 to 8 line decoder using basic gates and write its truth table. (08 Marks)
b. What is multiplexer? Realize 4% multiplexer using basic gates and write its truth tables. (08 Marks)

OR

- 10 a. With a neat explain Counter-Comparator ADC and successive Approximation type ADC. (08 Marks)
b. Explain the operation of R-2R DAC. Also derive the expression of output voltage. (08 Marks)

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