CBCS SCHEME

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18MT35

Third Semester B.E. Degree Examination, June/July 2024
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. With a neat circuit diagram and waveform, explain Double ended shunt clippers. **(07 Marks)**

b. Explain the working of positive clampers with neat circuit diagram and waveforms. **(05 Marks)**

c. Explain with a neat diagram the working of RC coupled BJT amplifier and also sketch the frequency response curve. **(08 Marks)**

OR

2 a. Explain first order low pass Butterworth filter and derive the gain and phase angle equations. **(08 Marks)**

b. Design a low pass filter at a cutoff frequency of 1KHz with a passband gain of 2. Using frequency scaling technique converts 1KHz cutoff frequency of LPF to cutoff frequency of 1.6KHz. Assume C = 0.01μfarad. **(06 Marks)**

c. With neat diagram and waveform, explain working of Narrow band reject filter. **(06 Marks)**

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 Non inverting comparator with a neat circuit diagram and waveform. **(06 Marks)**

Module-3

5 a. In detail explain pin diagram and internal architecture of 555 timer. **(10 Marks)**

b. Explain the operation of 555 timer as monostable multivibrator with help of circuit diagram and waveform. **(10 Marks)**

OR

6 a. Explain the operation of 555 timer as Astable multivibrator with the help of circuit diagram and waveform. **(10 Marks)**

b. With neat diagram explain any two applications of astable multivibrator. **(10 Marks)**

Module-4

7 a. Using K-map solve

i) $V = f(w, x, y, z) = \Sigma(1, 5, 7, 8, 9, 10, 11, 13, 15)$

ii) $T = f(w, x, y, z) = \pi(1, 3, 8, 10, 12, 13, 14, 15)$.. **(08 Marks)**

b. Design a full Adder from two half adder. **(06 Marks)**

c. Using 8:1 MUX realize $f(A\ B\ C\ D) = \Sigma(0, 1, 3, 4, 8, 9, 15)$. **(06 Marks)**

OR

8 a. What is Multiplexer? Explain with logic diagram quadruple 2 to 1 line multiplexer. **(10 Marks)**

b. Design BCD to decimal decoder circuit. **(10 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)**

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