CBCS SCHEME

USN | | | | | | | | | | |

15MT35

Third Semester B.E. Degree Examination, July/August 2022
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 V-I characteristics of an Ideal diode, silicon diode, Germanium diode and zener diode. **(08 Marks)**

b. Explain junction diode models with necessary equivalent circuits. **(08 Marks)**

OR

2 a. Explain, with diagrams, how a pn-junction diode can be used as a switch. **(06 Marks)**

b. Explain how the capacitor filter reduces the ripple in rectifier circuit. **(06 Marks)**

c. The input voltage of centre tapped full wave rectifier is 10 V (rms). The sum of the dc resistance of the transformer winding and forward dc resistance of the diode is $R_S = 0.2\Omega$, the load resistance $R_L = 10\Omega$ and forward diode drop $V_D = 0.7$ V, Find :

i) Peak load current
ii) DC load current.
iii) Individual diode dc current.
iv) DC output voltage.
v) PIV. **(04 Marks)**

Module-2

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

b. Design a wide band pass filter with $f_L = 200$hz, $f_H = 1$KHz

i) passband gain = 4
ii) draw the frequency response of the filter
iii) calculate the value of Q for the filter. **(08 Marks)**

OR

4 a. Explain second order high pass Butterworth filter with necessary circuit diagram and equations. **(04 Marks)**

b. Design Wein bridge oscillator for the Fig.Q4(b) below so that $f_0 = 965$hz. **(04 Marks)**

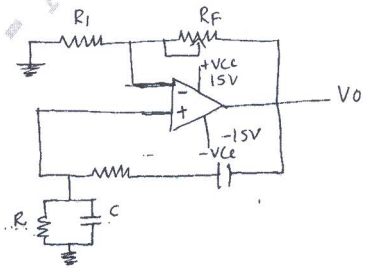

Fig.Q4(b)

c. State Backhausen criterion for sustained oscillations and explain phase shift oscillator with necessary circuit and equations. **(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)**

Module-4

7 a. Draw Rs latch with NAND and NOR gate circuit. **(04 Marks)**

b. Explain clocked master0slave JK flip-flop with necessary logic circuit. **(06 Marks)**

c. Explain bi – directional shift register with parallel load. **(06 Marks)**

OR

8 Explain 3 – bit synchronous – Binary up-down counter. **(08 Marks)**
Explain how read and write information transfer takes place in magnetic core-memory. **(08 Marks)**

Module-5

9 a. What is multiplexer? Realize 4 : 1 multiplexer using basic gates and write its truth table. **(08 Marks)**

b. Explain the operation of R-2R DAC. And also drive the expression of output voltage. **(08 Marks)**

OR

10 a. What is decoder? Realize 2 to 4 line decoder using basic gates and write its truth table. **(08 Marks)**

b. Explain the operation of a successive approximation ADC. **(08 Marks)**

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