CBCS SCHEME

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

17MT35

Third Semester B.E. Degree Examination, June/July 2023
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. Design a second order lowpass Butterworth filter at a higher cutoff frequency of 1KHz and draw the frequency response. **(10 Marks)**

b. Design a highpass filter at a cutoff frequency of 1KHz with a passband gain of 2 and plot the frequency response. **(10 Marks)**

OR

2 a. Design a wide bandpass filter with f_c = 200H and f_H = 1 KHz and passband gain = 4 and draw the frequency response. **(10 Marks)**

b. With neat diagram, explain all pass filter and derive the expression for gain and phase angle. **(10 Marks)**

Module-2

3 a. Derive the equations that explain the two criteria required to be fulfilled for oscillator. **(10 Marks)**

b. With a neat circuit diagram, explain phase shift RC oscillator. **(05 Marks)**

c. Design the phase shift oscillator for frequency of oscillation f_0 = 300Hz. **(05 Marks)**

OR

4 a. With the help of I/P and O/P waveforms explain the working of zero crossing detector. **(10 Marks)**

b. For Schmitt trigger circuit, explain the following :
i) Upper Trigger Point (UTP)
ii) Lower Trigger Point (LTP)
iii) Plot of Hysteresis Voltage. **(10 Marks)**

Module-3

5 a. With neat diagrams, explain the pin diagram and architecture of 555 Timer. **(10 Marks)**

b. Explain the operation of 555 Timer as a monostable multi-vibration with necessary diagrams. **(10 Marks)**

OR

6 a. Explain the operation of 555 Timer as an Astable multivibrator with necessary diagram. **(10 Marks)**

b. With neat circuit diagrams, explain the applications of astable multivibrator. **(10 Marks)**

Module-4

7 a. Explain the full adder circuit with the following : i) Truth table ii) Logic Diagram. **(10 Marks)**

b. Explain the working of 4 × 1 MUX with operation table, select lines and logic diagram. **(10 Marks)**

OR

8 a. Map the following fucntion on K' map F(A, B, C, D) = Σ1, 5, 6, 9, 14, 15. **(06 Marks)**

b. Impliment the following function using 4 × 1 MUX. F(A, B, C) = Σ1, 3, 5, 7. **(10 Marks)**

c. Draw the K'map for three variables. **(04 Marks)**

Module-5

9 a. With neat circuit analyze the operation of clocked JK Flip Flop. Also derive the characteristic equation from truth table. **(10 Marks)**

b. Design a synchronous 3 bit binary upcounter using the excitation table. **(10 Marks)**

OR

10 a. Design BCD Ripple counter. **(10 Marks)**

b. With a neat circuit analyze the operation of clocked SR flip flop using NOR latch. Also derive the characteristic equation from truth table. **(10 Marks)**

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