CBCS SCHEME

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

17MT35

Third Semester B.E. Degree Examination, Aug./Sept. 2020
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. With neat circuit diagram, explain the operation of phase shift oscillator. **(08 Marks)**

b. Design a phase shift oscillator so that f_0 = 200Hz. **(04 Marks)**

c. With a neat circuit diagram, explain the operation of wien bridge oscillator. **(08 Marks)**

OR

4 a. Explain zero crossing detectors with input and output waveforms. **(10 Marks)**

b. Explain the operation of Schmitt trigger with all necessary diagrams. **(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. Simplify the Boolean functions using K-maps

i) $F(w, x, y, z) = \sum(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$

ii) $F(ABCD) = A'B'C' + B'CD' + A'BCD' + AB'C'$

iii) $F = A'C + A'B + AB'C + BC$ **(10 Marks)**

b. Explain full adder and full subtractor with the help of truth table, derive the expression for sum, carry, borrow and difference. **(10 Marks)**

OR

8 a. Implement the following function with a multiplexer $F(ABCD) = \sum(0, 1, 3, 4, 8, 9, 15)$. By taking A as input and remaining as selection lines. **(08Marks)**

b. With neat logic diagram and truth table explain octal-to-binary encoder. **(06 Marks)**

c. Design a BCD to decimal decoder. **(06 Marks)**

Module-5

9 a. Explain the following flip flops with logic diagram and truth table.

i) RS Flip flop

ii) D flip flop

iii) T flip flop. **(10 Marks)**

b. Explain J–K flip-flop with truth table and how race around condition will be over comed by master slave. **(10 Marks)**

OR

10 a. Explain BCD ripple counter operation with the help of state diagram, logic diagram and timing diagram. **(10 Marks)**

b. Design a Binary up counters using T-flip flops. **(10 Marks)**

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