CBCS SCHEME

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15MT35

Third Semester B.E. Degree Examination, July/August 2021
Analog and Digital Electronics

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions.***

1 a. With a neat circuit diagram analyze the operation of full wave rectifier with a C filter and also evaluate the expression for ripple factor. **(10 Marks)**

b. Explain the following terms with respect to PN junction model:
i) Reverse recovery time
ii) Transition capacitance. **(06 Marks)**

2 a. Draw the VI characteristics of a semiconductor diode and explain it. **(08 Marks)**

b. Construct a double ended clipper circuit to clip the output waveform at +2V and -3V from 10V (p-p) supply voltage. **(08 Marks)**

3 a. With a neat sketch, explain the operation of first order low pass Butterworth filter. Also derive the expression for gain. **(10 Marks)**

b. Design a RC phase shift oscillator with frequency $f_0 = 200Hz$. **(06 Marks)**

4 a. With a neat sketch, explain the operation of notch filter. **(08 Marks)**

b. Design a wide band pass filter with $f_L = 200Hz$ and $f_H = 1kHz$, pass band gain = 4 calculate the value of quality factor. **(08 Marks)**

5 a. Explain the working of astable multivibrator with a neat circuit, necessary waveform and relevant expressions. **(10 Marks)**

b. Design a divide by 2 network using monostable multivibrator for the input trigger signal 2kHz with value of $e = 0.01\mu F$. **(06 Marks)**

6 a. With a neat sketch, explain the operation Schmitt trigger circuit. **(10 Marks)**

b. With a neat sketch demonstrate how astable multivibrator can be used as square wave generator. **(06 Marks)**

7 a. With a neat sketch, explain TTL logic. **(10 Marks)**

b. Implement NAND and NOR gate using CMOS logic. **(06 Marks)**

8 a. Implement the following using universal gates (NAND and NOR):
i) NOT ii) AND iii) OR iv) EX-OR. **(10 Marks)**

b. With a neat circuit implement 3 bit synchronous upcounter. **(06 Marks)**

9 a. Define multiplexer. Implement a 4 × 1 MUX using logic gates. **(08 Marks)**

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

10 a. Design a 3 × 8 decoder using 2 × 4 decoder. **(08 Marks)**

b. Explain the operation of R-2R DAC with neat sketch. **(08 Marks)**

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