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December, 2019

B.Tech. (Fashion & Apparel Engg. / Civil Engg.)

III SEMESTER

Basic Electronics (ESC201)

Time : 3 Hours] [Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) What is an ideal diode? Draw the voltage-current characteristics of ideal diode. (1.5)

(b) What is the need of output filters for rectifiers? Discuss. (1.5)

(c) What is IC regulator? Explain the 7805 voltage regulator. (1.5)

(d) What is Wein bridge oscillator? Discuss. (1.5)

(e) Give the difference between analog and digital signals. (1.5)

(f) What are universal gate? Design all basic gates with universals gates. (1.5)

(g) Design full adder using half adders. (1.5)

(h) What is a Flip-Flop? Design D flips-flop using SR flip-flop. (1.5)

(i) What is the difference between microprocessor and microcontroller? Discuss. (1.5)

(j) What is Barkhausen's criteria for oscillation? Discuss. (1.5)

PART - B

2. (a) What is a zener diode? How it works as voltage regulator? Explain. (7.5)

(b) Draw the circuit diagram of Full wave bridge rectifier and derive the expression to find out the ripple factor and efficiency. (7.5)

3. (a) Draw the input and output characteristic for NPN transistor in Common emitter configuration. (7.5)

(b) Draw the frequency response of CE configuration and discuss why gain falls at lower and higher frequency regions. (7.5)

4. (a) What is an ideal Operational amplifier? Explain the characteristics of an ideal Op-Amp. (7.5)

(b) Explain the operation of Op-Amp based integrator? What is practical integrator? (7.5)

5. (a) Discuss the operation of 555 timer as mono stable multi vibrator with circuit diagram. (7.5)

(b) Derive the relation to find closed loop gain in case on inverting feedback operational amplifier. (7.5)

6. (a) Draw the circuit diagram of RC phase shift oscillator and explain the operation. (7.5)

(b) Simplify the Expression

$Y = \Sigma_m (7, 9, 10, 11, 12, 13, 14, 15)$

using the K-maps. (7.5)

7. (a) What is the need of modulation? Compare AM and FM techniques. (7.5)

(b) What is shift register? Discuss its types and applications. (7.5)
