Ref. No.: Ex/CSE/ET/T/123A/2019(OLD)

B.E. COMPUTER SCIENCE AND ENGINEERING FIRST YEAR SECOND SEMESTER -2019

Subject: **BASIC ELECTRONICS** Time: 3hrs. Full Marks: 100

Answer any five questions

1. Draw and explain the V-I characteristics curve of a p-n junction diode at both forward as well as at reverse biased? Draw the circuit of a half wave rectifier and explain its operation. Calculate the efficiency and ripple factor of a half wave rectifier. Also make a comparison between different rectifier circuits.

[4+5+8+3]

2. (a) Explain with proper circuit that how clipping can be done at any half of a sinusoidal wave. Explain the role of the reference voltage source.

(b) With a neat circuit explain the operation of a diode clamping. Draw its input output waveforms.

[(8+4)+8]

3. (a) Draw the circuit of a two stage RC- coupled amplifier and explain its operation. Draw its gain frequency response and explain it.

(b) Explain with a neat circuit the operation of a class B push-pull amplifier. Mention its advantage and disadvantages.

[(6+6)+(4+4)]

4. How oscillator circuits can be classified?. Draw the circuit of Wien-bridge oscillator and explain its operation. Write down some advantage and disadvantages of Wien-bridge oscillator.

[4+12+4]

5. Make a comparison between Bipolar Junction Transistor (BJT) and a Field Effect Transistor (FET). Draw the structure and explain the operation of a n-channel JFET. Draw its voltage-current characteristics and from it explain how drain resistance (r_d), mutual conductance (g_m) and amplification factor (μ) can find out.

[5+5+4+6]

6. With simple block diagram explain the operation of a dc regulated power supply. Explain with a neat schematic the operation of a series voltage regulator and make a comparison between a series voltage regulator and a shunt voltage regulator.

[6+10+4]

[Turn over

7. (a)With a neat schematic explain the operation of an enhancement type of p-channel MOSFET. Make a comparison between a MOSFET and a JFET. With a neat circuit explain the operation of complementary MOSFET and mention its advantage.

[8+4+8]

8. Write short notes on the following: [4 × 5 = 20]

(a) Hartley oscillator,

(b) Transformer coupled amplifier.

(c) Class A power amplifier.

(d) Bridge Rectifier.