

**B.E. COMPUTER SCIENCE AND ENGINEERING FIRST YEAR SECOND SEMESTER -2017**Subject: **BASIC ELECTRONICS**

Time: 3hrs.

Full Marks: 100

Answer any five questions

1. How a p-n junction diode can act as a switch? Draw the circuit of a bridge rectifier and explain its operation. Calculate the efficiency and ripple factor of a bridge rectifier. Also make a comparison between different rectifier circuits.

[2+2+2+5+5+4]

2. (a) Explain with proper circuit that how clipping can be done at two independent level of a sinusoidal wave. Explain the role of the reference voltage source and the series resistance in the circuit.

(b) Draw a neat circuit to explain the operation of a diode clamping circuit. What happens at the output of the circuit when amplitude of input voltage suddenly increases? Draw its input output waveforms.

[(8+4)+8]

3. (a) Draw the circuit of a two stage R-C coupled amplifier and explain its operation. Draw its gain frequency response. Explain why gain falls at low and high frequency range of operation.

(b) Explain with a neat circuit the operation of a class B push pull amplifier. Mention its advantage and disadvantages. How drawbacks can be overcome in complementary symmetry class B push pull amplifier

[6+4)+(6+2+2)]

4. Write down the condition for oscillation in an oscillator. How oscillator circuits can be classified? Draw the circuit of Colpitt oscillator and explain its operation. Mention drawbacks of Colpitt oscillator and how it can be overcome in Hartley oscillator

[2+3+8+2+5]

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

[5+8+2+5]

6. Define the term line regulation and load regulation of a dc 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.

[4+12+4]

7. (a) Explain with a neat schematic the operation of an Bistable Multivibrator.
- (b) How feedback circuits can be classified? How negative feedback increases stability, increase input impedance and decreases the noise in an amplifier circuit.

[6+(2+4+4+4)]

8. Write short notes on the following:

[4 × 5 = 20]

- (a) R-C phase shift oscillator,
- (b) CMOS as an inverter
- (c) SCR and its turn-off mechanisms
- (d) Enhancement type of MOSFET and its operation