



- A) 40 %      B) 50 %      C) 75 %      D) 81 %
- 8) Ripple factor of a half wave rectifier is \_\_\_\_\_  
 A) 100 %      B) 50 %      C) 121 %      D) 0 %
- 9) In an enhancement type MOSFET, channel permanently exists.  
 A) True      B) False
- 10) In a transistor lightly doped part is \_\_\_\_\_  
 A) Base B) Collector C) Emitter      D) None of the above
- 11) In a P-N-P transistor, base is made of N type material.  
 A) True      B) False
- 12) If the base emitter junction and base collector junction of BJT both are forward biased, BJT operates in \_\_\_\_\_ region.  
 A) Active      B) Cut-off      C) Saturation region      D) None of the above
- 13) List the characteristics of laser.
- 14) Give any two difference between stimulated emission and spontaneous emission.

**Attempt any four questions from Q-2 to Q-8**

- Q-2      Attempt all questions      (14)**
- (a) Explain the formation of P- type semiconductors.      **07**
- (b) Classify the conductors, insulators and semiconductors with the help of energy band theory.      **07**
- Q-3      Attempt all questions      (14)**
- (a) Draw the V-I characteristics of diode and explain how diode works in forward bias condition.      **07**
- (b) Draw the symbol and V-I characteristics of zener diode and discuss various regions of the characteristics.      **07**
- Q-4      Attempt all questions      (14)**
- (a) Draw the circuit diagram and waveforms of full wave bridge rectifier and explain its operation.      **07**
- (b) Draw the circuit diagram, input and output voltage waveforms for below circuits.      **07**



- i) Series Positive Clipper Circuit
- ii) Negative Clamper Circuit

**Q-5**      **Attempt all questions**      **(14)**

- (a) Draw the circuit of common base configuration for BJT. Draw its output characteristics and explain regions of output characteristics.      **07**
- (b) A full wave rectifier circuit is fed from a transformer having a centre-tapped secondary winding. The *rms* voltage from a either end of secondary to centre tap is 30 V. If the diode forward resistance is 20 Ω and that of the half secondary is 8Ω, for a load of 1 k Ω. Calculate,      **07**
  - i) Maximum value of load current
  - ii) Average value of load current
  - iii) RMS value of load current

**Q-6**      **Attempt all questions**      **(14)**

- (a) Explain the transistor action with the help of an NPN transistor and show that  $I_E = I_B + I_C$ . Where  $I_B$  = Base Current,  $I_E$  = Emitter Current,  $I_C$  = Collector Current      **07**
- (b) Determine the following parameters for the below network.      **07**
  - i) Base Current  $I_B$  ii) Collector current  $I_C$  iii) Collector Emitter Voltage  $V_{CE}$



