



Total No. of Questions: 4



Enrollment No. EN 21CS 304058

Faculty of Engineering

Mid Sem I Examination April -2022

EN3ES16 Basic Electronics Engineering

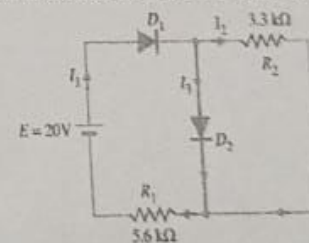
Programme: B.Tech.Branch/Specialisation: All

Duration: 2 Hrs.

Maximum Marks: 40

- Q.1 i. Zener breakdown occurs 1
1. Mostly in germanium junctions
  2. Due to rupture of covalent bonds
  3. In lightly doped junctions
  4. Due to thermally generated minority carriers
- ii. A clipper circuit always 1
1. Needs a DC source
  2. Clips both half cycles of input signal
  3. Clips upper portion of the signal
  4. Clips some part of the input signal
- iii. For the BJT's saturation region of operation, the input and output junctions should be connected as - 1
1. Forward biased & Reverse biased
  2. Forward biased & Forward biased
  3. Reverse biased & Reverse biased
  4. Reverse biased & Forward biased
- iv. Transistor current gain  $\beta$  can be expressed in terms of  $\alpha$  as- 1
1.  $\alpha/(1+\alpha)$
  2.  $\alpha/(1-\alpha)$
  3.  $(1+\alpha)/\alpha$
  4.  $(1-\alpha)/\alpha$
- v. A zener diode 1
1. Has a high forward voltage rating
  2. Has a sharp breakdown at low reverse voltage
  3. Is useful as an amplifier
  4. Has a negative resistance
- vi. The current direction is always shown on which terminal of BJT in its electronic symbol 1
1. Base
  2. Emmitter
  3. Collector
  4. Base and Collector both

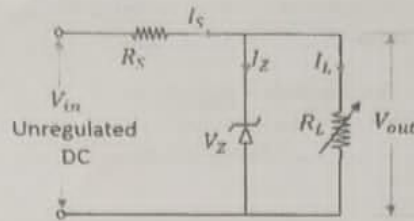
- vii. The depletion region in an open circuited PN junction contains 1
1. Electrons
  2. Holes
  3. Uncovered immobile impurity ions
  4. Neutralized impurity atoms
- viii. JFET is a ..... controlled device. 1
1. Power
  2. Current
  3. Voltage
  4. Energy
- ix. In the term of heavy doping and larger area, which one is correct for the BJT transistor 1
1. Base and Collector
  2. Emitter and Base
  3. Collector and Emitter
  4. Emitter and Collector
- x. Avalanche breakdown is primarily dependent on the phenomenon of 1
1. Collision
  2. Doping
  3. Ionizing
  4. Recombination
- Q.2 i. How Depletion layer forms in PN Junction diode? 2
- ii. Explain half wave rectifier with diagram and input/output waveforms. Write the expression of ripple factor and efficiency. 3
- iii. How current made to flow in n-Channel JFET? Explain full working functionality of JFET along with current equation. 5
- OR iv. Explain Common Base Configurations with input and output V-I characteristic, also explain its Current amplification gain. 5
- Q.3 i. Write any two basic differences between JFET and MOSFET. 2
- ii. 8



For the circuit shown above, Find the value of current  $I_1$ ,  $I_2$  and  $I_3$ . Diodes connected in circuit are silicon diodes and having internal resistances are zero (Simplified model).

OR iii.

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For a Zener shunt regulator shown in figure, if  $V_Z = 20\text{ V}$ ,  $R_S = 20\text{ k}\Omega$ ,  $R_L = 5.5\text{ k}\Omega$  and the input voltage varies from 32 to 48 V, Find the maximum and minimum values of Zener current.

- Q.4 i. Explain diode current equation in both forward and reverse biasing. 3  
ii. What is Bridge Rectifier? Explain with diagram and input/output waveforms. Give expression of ripple factor, efficiency and PIV. 7
- OR iii. For a silicon diode the reverse saturation current is  $2.5\text{ }\mu\text{A}$  at the temperature of 300 K, What could be the forward voltage value if forward current of 10 mA is flowing through the diode? 7

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