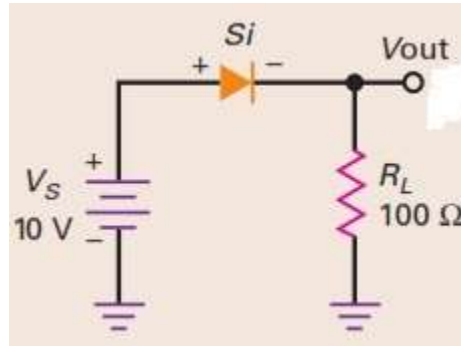


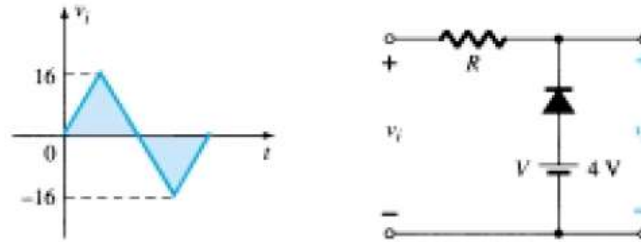
ASSIGNMENT-1
Subject Name: Basic Electronics
Subject Code: 303107151
Chapter 1

1. What is doping? Why it is required? List types of doping materials.
2. Explain the formation of PN Junction Diode. Also explain the Forward bias and reverse bias operation of PN junction diode with V-I characteristics.
3. If the surface-leakage current is 2 nA for a reverse voltage of 25 V, what is the surface leakage current for a reverse voltage of 35V?
4. Draw the diode equivalent circuit in forward bias and reverse bias for first, second and third approximation along with their curves.
5. Explain the energy band diagram in PN Junction Diode before diffusion and after equilibrium. Also explain energy hill.
6. Diode is linear device or non-linear device? Why? Explain the forward and reverse resistance of diode.
7. What is the output voltage as per first, second and third approximation in the following figure. Consider bulk resistance of diode is 0.23Ω



8. Explain the operation of Half Wave rectifier & Full Wave rectifier with circuit diagram and waveforms. Also derived the formula for V_{DC} , V_{RMS} , ripple factor & efficiency.
9. Explain the operation of the Bridge rectifier with circuit diagram & waveforms.
10. For the half wave rectifier circuit, AC supply given to the primary of the transformer is 240 V AC RMS with 50Hz. The resistance of the transformer secondary is 5Ω , forward resistance of the diode $R_f = 50\Omega$, load resistance is $1k\Omega$. Also note transformer primary to secondary turn ratio is 4:1. Calculate the following.
 - a. Average load current & average load voltage
 - b. RMS load current & RMS load voltage
 - c. DC load power & AC input power
 - d. Rectification Efficiency
11. A full wave rectifier circuit is fed from center tap transformer. The RMS voltage from the end of secondary to center tap is 30V. If the diode forward resistance is 2Ω and that of the half secondary is 8Ω . Calculate the following for the $1k\Omega$ load resistance.
 - a. Average load current & average load voltage
 - b. RMS load current & rms load voltage
 - c. DC load power & AC input power
 - d. Rectification Efficiency

12. Determine the output waveform for the network shown in below figure (Consider ideal Diode).



13. What is clamper circuit? Explain the positive and negative clamper circuit with waveforms and circuit diagrams.
14. Explain the difference between clipper and clamper circuit.
15. Why filter circuit is required? What are components can be used as filter elements? Explain the operation of half wave & Bridge Rectifiers with shunt capacitor filters with circuit diagram & waveforms.
16. What is the importance of the voltage multiplier circuit? Explain the Half wave and Full wave voltage double circuit with neat waver form and circuit diagram.
17. Define the following terms.
1. Free electrons
 2. Holes
 3. Covalent Bonds
 4. Core of atom
 5. Valance saturation
 6. Recombination
 7. Carrier Life time
 8. PN Junction Diode
 9. Depletion Region
 10. Potential Barrier
 11. Reverse saturation current
 12. Knee Voltage
 13. Break down voltage
 14. Surface Leakage current
 15. Peak Inverse Voltage
 16. Surge current