

UNIT-1

SAQ

1. What is a pn junction diode?
2. What are semiconductors?
3. What are conductors? Give examples?
4. What are insulators? Give examples?
5. Give the energy band structure of Insulator, semiconductor and conductor? What are insulators? Give examples?
6. What are Semiconductors? Give examples?
7. Differentiate between intrinsic and extrinsic semiconductor
8. Define the term diffusion current? Give the expression for diffusion current density?

LAQ

1. Explain the operation of P-N Junction Diode with its V-I characteristics.
2. Explain the dependency of temperature on PN junction diode characteristics.
3. Explain Static and Dynamic resistance in PN diode.
4. Explain Diffusion Capacitance and Transition capacitance.
5. Explain the formation of p-type semiconductor?
6. Determine the value of forward current for a pn junction with $I_o = 10 \mu A$, $V_f = 0.8V$, at $T=300K$. Assume silicon diode.
7. Explain the formation of n-type semiconductor?
8. What are the current components in a p-n diode? Explain the diode equation?
9. Draw the diode equivalent circuits and explain them?
10. Find the static and dynamic resistance of PN junction germanium diode if temperature is 27 degrees and reverse saturation current is $1 \mu A$ for an applied voltage of 0.2 V.
11. Give the load line analysis for the diode? Differentiate between ideal and practical diode?
12. Determine the forward resistance of a PN junction diode, when the forward current is 5ma at $T=300K$. Assume silicon diode?

13. Write the characteristic feature to distinguish between n-type and p-type semiconductors.
14. Determine the value of forward current for a pn junction with $I_o = 10 \mu A$, $V_f = 0.8V$, at $T=300K$. Assume silicon diode?
15. Differentiate between conductors, semiconductors and insulators?
16. The voltage across a silicon diode at room temperature (300K) is 0.7volts when 2mA current flows through it. If the voltage increases to 0.75V, calculate the diode current. (Assume $V_t=26mV$)?

UNIT-2

SAQ

1. What is meant by tunneling phenomenon?
2. Write the differences between pn diode and zener diode?
3. What is Zener effect?
4. Write about Avalanche break down mechanism?
5. Draw the V-I characteristics of Tunnel diode?
6. Differentiate between ideal and practical diode
7. Draw V-I characteristics of SCR?
8. Draw the symbol and V-I characteristics of Zener diode?

LAQ

1. Explain the V-I Characteristics of Silicon Controlled Rectifier (SCR).
2. Explain how Zener Diode acts as a Voltage Regulator.
3. Explain different Breakdown Mechanisms?
4. Explain the V-I characteristics of Tunnel diode and list applications of Tunnel diode.
5. Explain the operation of Varactor diode.
6. Compare Zener breakdown and avalanche breakdown.
7. Explain the operation of LED?
8. With the help of energy band diagrams explain the working of Tunnel diode?
9. Explain the working of SCR with a neat diagram.

- 10.Explain V-I characteristics of Zener diode and list out the applications of Zener diode.
- 11.Explain the operation of photo diode?
- 12.Write the applications of LED,LCD and photo diode?
- 13.Explain the operation of Varactor diode.
14. Write the applications of Zener diode,varactor diode,Tunnel diode and SCR?
- 15.compare Zener breakdown and avalanche breakdown.
- 16.Explain the operation of LCD?

UNIT-3

SAQ

- 1.State the advantages of Bridge rectifier?
- 2.Write the difference between HWR and FWR
- 3.Write the advantages and disadvantages of Half Wave Rectifier?
- 4.Write the advantages and disadvantages of Full Wave Rectifier?
- 5.Write the difference between FWR and Bridge Rectifier?
- 6.What are the disadvantages of using center tapped transformer in FWR?
- 7.Write the functions of the capacitor and the inductor and why they connected in parallel and
- 8.How many diodes are used in HWR,FWR and Bridge Rectifier?Draw only the input and output waveforms for the 3 rectifiers?series to R_L ?

LAQ

1. Explain the operation of Full Wave Rectifier with neat sketches.
2. A Full wave Rectifier connected to a 230V, 50Hz through a transformer of turn ratio 10:1. Load resistance value is 900Ω and diode forward resistance is 100Ω . Calculate Efficiency and Ripple factor.
3. A HWR having a load resistance of 1kohms , if the diode resistance is 10ohms, had a signal voltage of peak value of 24V find (a) I_{dc} (b) V_{dc} (c) I_{rms} (d) Ripple factor. (e) Efficiency
- 4.Analyze the ripple factor ,efficiency ,and PIV of Half wave rectifier with neat sketches?

5. Explain how diode works as Rectifier? Define the following terms: i) ripple factor ii) efficiency iii) PIV?
6. Explain the operation of Half wave rectifier with neat sketches?
7. Explain the working of C filter and derive the expression for ripple factor?
8. Explain the working of CLC filter and derive the expression for ripple factor?
9. Derive I_{dc} , V_{dc} , efficiency and ripple factor for Half Wave Rectifier?
10. Derive I_{dc} , V_{dc} , efficiency and ripple factor for Full Wave Rectifier?
11. Draw and explain LC -section filter
12. Explain the working of Inductor filter for FWR and derive the expression for ripple factor?
13. Explain how diode works as Rectifier. Define the following terms: i) ripple factor ii) efficiency iii) PIV
14. Explain the operation of Half wave rectifier with neat sketches
15. Explain the operation of Bridge rectifier ?
16. Determine I_{dc} , I_{rms} , Ripple factor and efficiency of a FWR with diode forward resistance of 20Ω each, $R_L = 1k\Omega$ and $V_{dc} = 55.4v$.

UNIT-4

SAQ

1. What is a Bipolar Junction Transistor (BJT)?
2. Define Early effect?
3. Define stability factor and write the expression for the stability factor?
4. Define Thermal runaway?
5. What is the requirement for transistor biasing?
6. Define operating point by drawing graph in the active region?
7. Compare the width and doping levels for the 3 regions of transistor? What are the BJT configurations?
8. What are the types of transistor? What are the regions of operation of transistor?

LAQ

1. Explain I/P & O/P characteristics of CE configuration with neat circuit diagram.
2. Determine the operating point for a fixed bias circuit whose $V_{cc} = 10V$, $R_c = 2K\Omega$, $R_b = 930K\Omega$, $\beta = 50$ for a Si Transistor?
3. Explain the input and output characteristics of CB configured transistor circuit with a neat circuit diagram.
4. Derive the expression of stability factor for the Emitter feed back circuit?
5. Explain the input and output characteristics of CC configured transistor circuit with a neat circuit diagram.
6. Derive the expression for stability factor of Voltage divider bias ?
7. Derive the expression of stability factor for the Collector to Emitter feed back bias?
8. Explain operating point of a transistor and explain the concept of D.C Load line.
9. Explain the principle of operation of NPN and PNP transistors?
10. How the transistor acts as an amplifier and as a switch?
11. Indicate the operating points near cut-off, active and saturation regions with graphs and explain them?
12. Explain the thermal stability?
13. Explain the transistor biasing and stabilization for the CE configuration?
14. What are the transistor current components?
15. Derive the stability factor for the Fixed bias circuit?

UNIT-5

SAQ

1. What is Boolean algebra?
2. Write the procedure for converting Binary to Decimal?
3. Convert this $(1101)_2$ from binary to decimal?
4. Convert this $(111111)_2$ from binary to decimal?
5. Write the decimal number and corresponding binary number from 1 to 10 numbers?

- 6.Convert this $(10111)_2$ from binary to decimal?
- 7.What are Universal gates and draw their truth tables?
- 8.Write the sum and carry expressions for the Half adder and Full adder?

LAQ

- 1.Explain the operation of NAND and NOR gates with truth table?
2. $(2046.0725)_{10} = (\text{-----})_2$
 $(0.001101101)_2 = (\text{-----})_{10}$
- 3.Explain the procedure for converting Hexadecimal to decimal code with examples?
- 4.Give the logic symbol,electrical equivalent,logical expression and truth table for the following logic gates i)AND ii)OR iii)NOT
- 5.Draw the logic symbol ,electrical equivalent,logical expression and truth table for the following logic gates i)XOR ii)XNOR iii)NOT
- 6.Convert this $(1010100)_2$ from binary to decimal?
- 7.Convert the following decimal in to binary:
i) $(125)_{10}$ ii) $(68)_{10}$ iii) $(256)_{10}$
- 8.What are the number system types?
- 9.Explain the procedure for converting:
i)decimal to binary
ii)octal to decimal conversion
iii)Decimal to octal conversion
- 10.Explain the operation of Half adder with circuit diagram,truth table and derive its expression?
- 11.Explain the operation of Full adder with circuit diagram,truth table and derive its expression?
- 12.Explain the procedure for converting:
i)octal to binary conversion
ii)Binary to octal conversion
- 13.Write the binary,hexadecimal and octal forms for the decimal numbers from 1 to 10?

