UNIT 4: ANALOG ELECTRONICS

Two-Mark Questions:

1. **What is the working principle of a diode?**

2. **Explain the function of a Zener diode.**

3. **What are the applications of a diode in electronic circuits?**

4. **Explain the working of a Half-Wave Rectifier.**

5. **What is the difference between a half-wave and full-wave rectifier?**

6. **Explain the operation of a BJT (Bipolar Junction Transistor).**

7. **What is the application of a Zener diode as a voltage regulator?**

8. **What is the working of a MOSFET?**

9. **What is the principle of a voltage regulator circuit?**

10. **State the applications of a UPS (Uninterruptible Power Supply).**

11. **What are the advantages of a full-wave rectifier over a half-wave rectifier?**

12. **Explain the input and output characteristics of a BJT.**

13. **What is the significance of the threshold voltage in a MOSFET?**

14. **What are the advantages of using a Zener diode for voltage regulation?**

15. **How does a capacitor filter work in a rectifier circuit?**

16. **What are the key parameters of a diode?**

17. **What is the principle of operation of a rectifier?**

18. **What is a rectified signal, and how does it relate to the input AC signal?**

19. **Explain the working principle of a UPS system.**

20. **What is the role of a diode in a half-wave rectifier?**

21. **Explain the difference between an ideal diode and a real diode.**

22. **What is the function of the load resistor in a rectifier circuit?**

23. **What is the significance of the cut-in voltage of a diode?**

24. **How does a BJT amplify a small signal?**

25. **What are the advantages of a voltage regulator in electronic circuits?**

Problems:

1. **Problem 1:**
   Design a full-wave bridge rectifier circuit. Calculate the DC output voltage if the AC input is 10 V RMS.

2. **Problem 2:**
   Calculate the efficiency of a half-wave rectifier with a resistive load of 100 Ω and an input voltage of 120 V RMS.

3. **Problem 3:**
   A diode has a forward voltage of 0.7 V and a current of 20 mA. Calculate the power dissipated in the diode.

4. **Problem 4:**
   Design a voltage regulator using a Zener diode for a 12 V output with a 15 V input.

5. **Problem 5:**
   Calculate the current flowing through a 10 Ω resistor connected to a 12 V battery with a forward-biased silicon diode in series.