Question Bank for Introduction to Electronics Engineering (BESCK104C/204C)

Module – 1 Power Supplies

1. What is a regulated power supply? With neat block diagram, summarize the working of DC power supply. Also mention the principal components used in each block. ( 6M)

2. With a neat block diagram, explain the working of a DC power supply. Also mention the principal components used in each block. (7M)

3. Draw the block diagram of DC power supply and explain the individual blocks. ( 8M)

4. What is a rectifier? What are the different types of rectifiers?

5. With a neat circuit diagram, explain the working of a half-wave rectifier along with relevant waveforms.

6. A mains transformer having a turns ratio of 44:1 is connected to a 220 V r.m.s. mains supply. If the secondary output is applied to a half-wave rectifier, determine the peak voltage that will appear across a load.

7. What is the need for reservoir and smoothing circuits? Explain.

8. Explain the working of a half-wave rectifier with reservoir capacitor along with relevant waveforms.

9. The R-C smoothing filter in a 50 Hz mains operated half-wave rectifier circuit consists of R1=100 Ω and C1=1,000 μF. If 1 V of ripple appears at the input of the circuit, determine the amount of ripple appearing at the output.

10. A half-wave rectifier is fitted with an R-C smoothing filter comprising R=200 Ω and C= 50 μF. If 2 V of 400 Hz ripple appear at the input of the circuit, determine the amount of ripple appearing at the output.

11. Explain the working of bi-phase full wave rectifier circuit with neat diagram and waveforms. (8M)

12. With a neat circuit diagram, explain the working of a bi-phase rectifier along with relevant waveforms. Also explain how the output changes when a reservoir capacitor is used.

13. With neat circuit diagram and waveforms explain the working of a full wave bridge rectifier. (8M)

14. With a neat circuit diagram and waveforms, explain the working of bridge rectifier without filter. (8M)

15. With a neat circuit diagram, explain the working of a bridge rectifier along with relevant waveforms. Also explain how the output changes when a reservoir capacitor is used.

16. Discuss the need of filter circuit. With circuit diagram and waveforms, brief out the operation of smoothing filter for full wave rectifiers. (7M)

17. What is a voltage regulator?

18. Draw the circuit diagram of voltage regulation and explain the operation. (6M)

19. Explain the operation of a simple shunt Zener voltage regulator. ( 7M)

20. A 5 V zener diode has a maximum rated power dissipation of 500 mW. If the diode is to be used in a simple regulator circuit to supply a regulated 5 V to a load having a resistance of 400 Ω, determine a suitable value of series resistor for operation in conjunction with a supply of 9 V. (7M)

21. A 6 V zener diode has a maximum rated power dissipation of 500 mW. If the diode is to be used in a simple regulator circuit to supply a regulated 6 V to a load of 500 Ω, determine a suitable value of series resistor for a supply of 12 V. (6M)

22. If a 9 V zener diode is to be used in a simple shunt regulator circuit to supply a load having a nominal resistance of 300 Ω, determine the maximum value of series resistor for operation in conjunction with a supply of 15 V.

23. Explain the terms output resistance and voltage regulation with respect to voltage regulator.

24. The following data were obtained during a test carried out on a d.c. power supply: (i) Load test Output voltage (no-load) = 12 V Output voltage (2 A load current) = 11.5 V (ii) Regulation test Output voltage (mains input, 220 V) = 12 V Output voltage (mains input, 200 V) = 11.9 V Determine (a) the equivalent output resistance of the power supply and (b) the regulation of the power supply

25. The following data were obtained during a load test carried out on a d.c. power supply: Output voltage (no-load) = 8.5 V Output voltage (800 mA load) = 8.1 V Determine the output resistance of the power supply and estimate the output voltage at a load current of 400 mA

26. The following data were obtained during a regulation test on a d.c. power supply: Output voltage (a.c. input: 230 V) = 15 V Output voltage (a.c. input: 190 V) = 14.6 V Determine the regulation of the power supply and estimate the output voltage when the input voltage is 245 V.

27. What is a voltage multiplier?

28. With circuit diagram explain the following: Voltage Doubler, Voltage Tripler (5M)

29.Draw the circuit diagram of voltage doubler and the working operation. (6M)

30. What is voltage multiplier and mention its applications? With circuit diagram brief out the operation of voltage tripler circuit. (7M)