Objective Type Questions

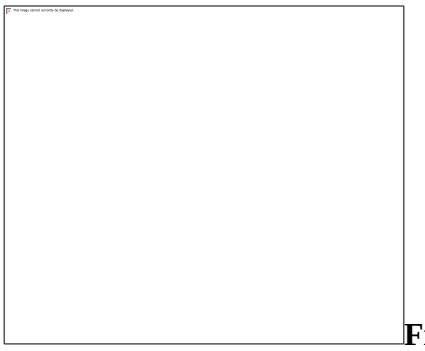
1. Why pure semiconductors are insulators at 0^o K?
2. What is effect of temperature on barrier voltage?
3. What is difference between electron and hole?
4. Why electrons have greater mobility than holes in a semiconductor material?
5. Describe briefly energy bands in solids?
6. Define drift current in good conductor?
7. Distinguish between drift speed and Fermi speed?
8. Explain effect of doping on semiconductor
9. What is the effect of doping level on width of depletion layer?
10. Define Ohm's law and gives name of two non ohmic devices?
11. Do pure semiconductors obey Ohm's law?
12. Express proportional voltage formula for two resistances connected in series?
13. Why Silicon is invariably used in the manufacture of junction photodiodes?
14. What is avalanche Breakdown in reverse biased P-N Junction?
15. Give at least three applications of p-n junction photodiode.
16. What do you know about silver Oxide Cell?
17. Discuss difference between insulator and conductor?
18. Define drift current in a good conductor?
19. Can a transformer operate on DC?
20. Define threshold voltage. Give its value for Si and Ge Junction?
21. What is zero reference level? Why we need it during voltage measurements at different points in electric circuit.
22. Define rectification?
23. Under what condition a transistor can operate in active region.
24. What are the conditions for proper working of a transistor in normal circuits?
25. Draw symbols for NPN and PNP transistor?
26. Draw the circuit diagram of a transistor used as common collector configuration
27. Why Collector-Base Junction is always reverse biased?
28. Which factors control the capacitance of the capacitor?
29. Differentiate transition capacitance and diffusion capacitance?
30. What is the basic principle behind the propagation of light in optical fiber.
31. In an optical fibre why refractive index of core is kept higher than cladding?
32. Why optical fibers are better than metallic wires?
33. Write down two examples of non linear resistor

34. Define Silicon Controlled Rectifier (SCR)?
35. Define Silicon Controlled Rectifier with its symbolical representation?
36. Mention at least five different energy sources
37. Explain, what is the source of magnetism?
38. Explain, what is the source of magnetism?
39. Briefly describe how electrons are multiplied in photomultiplier tube?
40. Write down the significance of inductor, how it respond to a.c?
41. On what facts inductance of an inductor depends?
42. Draw symbols of an air-core and ad iron-core inductor?
43. Why we use series voltage dividers circuits?
44. Why Silicon is invariably used in the manufacture of junction photodiodes?
45. Define Silicon Controlled Rectifier with its symbolical representation?
46. Differentiate Zener break down and avalanche breakdown?
47. What you know about silver Oxide Cell?
48. Why we use cells in series and parallel connection?
49. What are carrier waves?
50. What is Frequency modulation?
51. What is Amplitude modulation?
52. Express proportional voltage formula for two resistances connected in series?
53. Calculate inductive reactance offered by a coil to the passage of direct current?
54. On what facts inductance of an inductor depends?
55. Briefly describe how electrons are multiplied in photomultiplier tube?
56. What is the first ionization energy of an electron in hydrogen atom?
57. Distinguish between drift speed and Fermi speed?
1. Why PIN Photodiodes have faster response than even the P-N Photodiode?
2. Why we need filters in the electronics circuits?
3. What is the principle of LED?
4. The colour of light emitted by LED depends on what?
5. Define Solar cell? Draw its symbol.
6. Briefly describe total internal reflection.
7. If total current drawn from four 1.5V cells connected in series is 1 ampere, how much current each cell supplies?
8. Define ripple factor?
9. What is a filter circuit?
10. What is a filter circuit?
11. What is the basic principle behind the propagation of light in optical fiber.

12. Prove that $\boldsymbol{\beta = \frac{\alpha}{1-\alpha}}$
13. How Ohm's law can be expressed graphically for linear resistors?
14. What is the effect of doping level on width of depletion layer?
15. Why Silicon is invariably used in the manufacture of junction photodiodes?
16. Briefly describe total internal reflection.
17. Can a transformer operate on DC?
18. What is difference between electron and hole?
19. Why we use cells in series and parallel connection?
20. Mention at least five different energy sources
21. Why we need filters in the electronics circuits?
22. What are the conditions for proper working of a transistor in normal circuits?
23. What is voltage divider circuit? Explain its significance.
24. Give two applications of transformers
25. Briefly describe how electrons are multiplied in photomultiplier tube?
26. Why optical fibers are better than metallic wires?
27. Differentiate mobile charge carriers and immobile ions.
28. What is the principle of Transformer?

Subjective Type Questions

1. Discuss Capacitance of a Capacitor in series and parallel connection?
2. Calculate the inductive reactance offered by a coil of inductance 250µH to radio frequency currents of frequencies (i) 1MHz (ii) 10MHz
3. Define Barrier voltage? Write down the steps involved in the formation of P-N Junction.
4. Differentiate mobile charge carriers and immobile ions.
5. What is a parallel circuit? Explain characteristics of a parallel resistive circuit?



6. In the circuit of Fig 1, Find **Fig 1**
    1. Circuit current

2. Voltage of point A with respect to ground

3. Voltage of point B with respect to A

7. Define Ohm law? Explain Graphical Representation of Ohm's law.

Fig II

8. In the circuit of Fig II, Find

(i) Circuit current

(ii) Potential of point B

(iii) Value of Lowest Potential

9. State Ohm law? Explain its graphical representation also differentiate linear resistor and on-linear resistor.

10. In the circuit of fig III, calculate
Fig III

(i) Potential at point A w.r.to ground

(ii) Potential Difference between A and B

11. Explain principle, construction, working and advantages of Bulk type photoconductive cell.

12. Define Optical Fibre? Classify Optical Fibres according to the way they propagate light.

13. Explain construction and working of full wave rectifier usingCentre tapped transformer.

14. A I phase half wave rectifier supplies power to a 1KΩ load. The input supply voltage is 200V rms. neglecting forward resistance of the diode, Calculate

(i) V_{dc} (ii) I_{dc} (iii) ripple voltage (rms value)

15. Draw a NPN Transistor circuit in common collector configuration and discuss its input, output characteristics.

16. What is a Solar cell, give its principle, construction, working and uses?

17. Define magnetic materials. Classify magnetic materials according to their magnetic properties with examples

18. Differentiate Transition capacitance and Diffusion capacitance

19. Mobilities of electrons and holes in a sample of intrinsic Germanium at room temperature are $0.36 m^2/V\text{-}s$ and $0.17 m^2/V\text{-}s$ respectively If the electrons and hole densities are each equal to $2.5 \times 10^{-19}\, m^3$, Calculate Germanium conductivity

20. Explain Construction, working, and applications of Light Emitting diode.

21. What is integrated Circuit? Explain classification of ICs by structure

22. Define filter, Explain Shunt Capacitor Filter

23. Explain important biasing rules for the proper working of a transistor

24. Define inductor. Explain Mutual Inductance in detail.

25. Calculate the inductive reactance offered by a coil of inductance 250µH to radio frequency currents of frequencies (i) 1MHz (ii) 10MHz

26. Define series circuit? Explain characteristics of a series resistive circuit?

27. A 12V battery of negligible internal resistance is connected across a parallel combination of 4K, 6K, and 12K resistors. Compute

    1. Combined circuit resistance
    2. Current supplied by the battery
    3. Power supplied by the battery

28. What is Transformer? Explain principle, construction, working of Transformer

29. A power transformer has 100 primary turns and 600 secondary turns. If primary voltage is 120V and full load primary current is 12A, Find secondary (i) Voltage V_2 (ii) current I_2

30. What is P-N Junction? Explain Forward and Reverse Voltage Current Characteristics of a P-N junction

31. Explain Transistor biasing for the proper working of a PNP and NPN transistor

32. Following readings are obtained in transistor circuit of CB Configuration.

$I_E = 1mA$, $\alpha = 0.95$

Find the values of I_B and I_c

33. Define Modulation? Discuss Frequency modulation in detail.

34. Discuss the 'Opens' and 'shorts' conditions in a parallel resistive circuit?

35. Briefly explain the factors controlling the capacitance of the capacitor

36. what is Junction Breakdown? Which mechanisms are responsible for breakdown under increasing reverse voltage?

37. **Explain** construction, working, and waveforms of full wave bridge rectifier

38. **What** is modulation? Why we use it? Compare the amplitude modulation with frequency modulation

39. Draw a NPN Transistor circuit in common Emitter configuration and discuss its input, output characteristics. Using graphs.

40. What are Fibre optics. Classify briefly fibre optics according to the way light propagates.

41. Compute the velocity and wavelength of light of frequency $f = 0.5 \times 10^{15}$ Hz. When travelling through glass having a refractive index of $n_1 = 1.5$

42. What is voltage multiplier? Draw the circuit diagram of full wave voltage doubler and discuss in detail its working

43. What is capacitor. Explain Capacitance of capacitor for series and parallel connections

44. Explain principle, construction and working of a Transformer with the help of circuit diagram.

45. Analyze series parallel resistive circuit? Also discuss 'Opens' and 'Shorts' in a series parallel resistive circuit.

46. Explain how transistor can act as a switch.

47. What is modulation? Explain Amplitude modulation

48. Explain construction, working and uses of solar cell with the help of circuit diagram

49. Two capacitors of 0.0005μF and 0.0007μF are connected in series. Find their combined capacitance

50. Draw the transistor equivalent model of SCR, with the help of this model, explain the working of SCR also mention its application.

51. Draw and explain the Forward and reverse characteristic curve of PN-junction diode; discuss on this graph V_{br} and I_{Sat}.

52. What is LED, explain its construction and working also draw its symbol

53. Analyze series parallel resistive circuit? Also discuss ‘Opens’ and ‘Shorts’ in a series parallel resistive circuit.