

Section – A

Answer ANY TEN questions

10 x 2 = 20

1. What is dispersion? Which colour gets relatively more dispersed?
2. Define power of a lens. What is its unit?
3. How do you convert a moving coil galvanometer into an ammeter?
4. Magnetic lines form continuous closed loops. Why?
5. A transformer converts a 220V a.c. into a 2000V a.c. Calculate the number of turns in the secondary in if the primary has 10 turns.
6. Microwaves are used in Radars. Why?
7. Write down de-Broglie relation and explain the terms therein.
8. What is a n-type semiconductor? What are the majority charge carriers in it?
9. Define modulation. Why is it necessary?
10. What are the basic blocks of communication system?
11. What is myopia? How can it be corrected?
12. Distinguish between ammeter and voltmeter.
13. Define magnetic declination.
14. Give two uses of infrared rays.
15. What is work function?

Section –B

Answer ANY SIX questions

6 x 4 = 24

16. Define critical angle. Explain total internal reflection using a neat diagram.
17. Explain formation of a mirage.
18. Explain Doppler effect in light. Distinguish between red shift and blue shift.
19. State and explain Coulomb's law in electricity.
20. Derive the equation for the couple acting on a electric dipole in a uniform electric field.
21. Define intensity of electric field at a point. Derive an expression for intensity due to a point charge.

22. Derive an expression for potential due to a point charge
23. Derive an expression for the capacitance of a parallel plate capacitor.
24. Derive the formula for equivalent capacitance in series combination of capacitors.
25. State and explain Biot-Savart law.
26. Describe the ways in which Eddy currents are used to advantage.
27. Explain the different types of spectral lines.
28. What are the limitations of Bohr's theory of hydrogen atom?
29. Describe how a semiconductor diode is used as a half wave rectifier.

Section –C

Answer ANY TWO questions

2 x 8 = 16

30. Explain the formation of stationary waves in an air column enclosed in open pipe. Derive the equation for frequencies of harmonics produced.
31. State Kirchhoff's laws for electrical network.
Using these laws deduce the condition for balance in a Wheatstone bridge.
32. Explain the principle and working of a nuclear reactor with the help of a labeled diagram.
Calculate the energy equivalent of 1g of a substance.
33. How are stationary waves formed in closed pipes?
Explain the modes of vibrations and obtain relations for their frequencies.
A closed organ pipe 70 cm long is sounded. If the velocity of sound is 331 ms^{-1} , what is the fundamental frequency of vibration of the air column?

Note:

- The questions are obtained from internet and from the students from their interaction for paper discussion after the examination.
- The questions are given here only for ready reference for the students for preparation for upcoming examinations