XIIKDAR21
5001-C
PHYSICS

Time : 3 Hours]   **[Maximum Marks : 70**

Section–A   1 each

1. What is the order of resistivity of an insulator ?

2. From where does the electrical energy come in a generator ?

3. Which part of the electromagnetic spectrum is suitable for treatment of cancer tumours ?

4. How intensity of incident light effects photoelectric current ?

5. For which diode, the output voltage is a regulated voltage ?

Section–B   2 each

6. When is the force on a moving charage due to magnetic field maximum and when is it minimum ?

Or

Give *two* factors by which the current sensitivity of a moving coil galvanometer can be increased.

7. Distinguish between average value and r.m.s. value of an alternating current.

8. Can an electromagnetic wave be deflected by magnetic or electric field ? Explain.

9. Write the conditions for total internal reflection to take place.

10. (a) What is Communication System ?

    (b) Name the elements of Communication System.

Section—C
3 each

11. Deduce Ohm's law using the concept of drift velocity.

12. State Coulomb's law in electrostatics. Express it in vector form.

Or

Calculate electric field intensity at a point on the axial line of a dipole.

13. Explain how the internal resistance of a primary cell can be determined using a potentiometer ?

14. An electron enters a magnetic field of 5 T intensity with a velocity of 5×10^6 ms^{-1} at an angle of 30° with the field. Find the magnitude of the force acting on the electron.

15. State Ampere's circuital law. Derive an expression for the magnetic field due to a current carrying straight solenoid.

16. In Young's interference experiment, the ratio of intensity at the maxima and minima in the interference pattern is 25 : 9. What will be the ratio of amplitude of two waves ?

17. (a) What do you mean by dual nature of matter waves ?

    (b) Obtain de-Broglie equation for a material particle.

18. What is Radioactivity ? Deduce the relation $N = N_0 \cdot e^{-\lambda t}$.

19. Distinguish between isotopes and isobars. Give examples.

20. What is a Rectifier ? Explain the working of $p-n$ junction diode full wave rectifier.

21. Explain with the help of circuit diagram, the action of PNP or NPN transistor.

22. Explain ground wave propagation of radio waves.

Section–D

23. Rekha and Ruhi were classmates. Rekha found out that Ruhi was not able to see the letters on the board properly and also complained of frequent headaches. Rekha suggested to Ruhi to get her eyes checked. Ruhi followed Rekha's suggestion and thanked her saying she felt comfortable after wearing the spectacles. Now answer the following questions :

    Questions :–

    (i) What was the eye defect that Ruhi had ?

    Questions :–

    (i) What was the eye defect that Ruhi had ?

    (ii) How can it be corrected ?

    (iii) Rekha was a true friend. Justify.

(4)

Section–E   5 each

24. (a) Using Gauss's law, prove that electric field at a point due to a uniformly charged plane sheet is independent of distance from it.

(b) How is the field directed if the sheet is (i) positively charged (ii) negatively charged ?

Or

(a) Define capacitance of a capacitor. Derive an expression for the capacitance of a parallel plate capacitor.

(b) Explain principle of capacitor.

25. Derive an expression for average power of an a.c. circuit. How will you differentiate between average power and virtual power ?

Or

Describe briefly the theory of a transformer. Explain copper loss, iron loss and hysteresis loss in it.

26. Stating the assumptions made and convention of signs used, derive the lens maker's formula for a thin lens.

Or

State Huygens principle. Using this principle, illustrate how a parallel beam of light is reflected from a plane mirror. Prove the laws of reflection.

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B–1–C