5101-Z
PHYSICS

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

Section–A

1 each

1. For what basic purpose the cells are connected in series and in parallel.
2. Is there any difference between light wave and matter waves ?
3. In which region of electromagnetic spectrum does the Lyman series of hydrogen atom lie ?
4. How does the junction width change, when a *p–n* junction is forward biased ?
5. Can two *p–n* junction diodes placed back to back work as *p–n–p* transistor ? Give reason to justify your answer.

Section–B

2 each

6. Explain Self-Induction. Define co-efficient of self-induction.

Or

What is importance of power factor in an a.c. circuit ?

7. An object is placed 10 cm in front of a concave mirror of radius of curvature 15 cm. Find the nature, position and magnification of the image.

8. Draw a curve between mass number and average binding energy.

9. Explain how AND gate is realised.

10. What is communication system ? Name its major components.

Section–C 3 each

11. Define electrical capacitance of a conductor. On what factors does it depend ? Give its unit.

12. In a potentiometer, a cell of e.m.f. 1.25 V gives a balance point at 35.0 cm length of the wire. If the cell is replaced by another cell and the balance point shift to 63.0 cm, what is the emf of the second cell ?

Or

Three identical cells each of e.m.f. 2 V and unknown internal resistance are connected in parallel. This combination is connected to a 5 ohm resistor. If the terminal voltage across the cell is 1.5 volt. What is the internal resistance of each cell ?

13. How will you use potentiometer for comparing the e.m.f's of two given cells ?

14. Derive an expression for magnetic field at a point well inside a solenoid carrying current.

15. State and explain Faraday's law of electromagnetic induction.

16. Calculate the impedance of series LCR circuit.

17. Give two uses of each of the following :

    (a) Gamma rays

    (b) Infrared rays

    (c) Ultraviolet rays