CLASS: 10+2
TERM II (2021 -2022)
SUBJECT: PHYSICS

Time Allowed: 2 Hrs **M.M.:35**

NOTE:

1. Question paper has total 17 questions.
2. All questions are compulsory.
3. Q.1 to 5 will carry 1 mark each.
4. Q.6 to 13 will be of 2 marks each. There will be internal choice in two questions.
5. Q.14 to 16 will be of 3 marks. There will be internal choice in two questions
6. Q.17 will be of 5 marks. There will be internal choice in it.

1. One Dioptre is power of a lens of focal length _____.

2. What is the phase difference between any two points on a wave front?

3. If the intensity of radiations incident on a photosensitive plate is doubled, how does the stopping potential will change?

4. Name the series of hydrogen atom which lie in UV region.

5. Name the type of material which has energy gap between conduction band and valence band of the order of 0.07 eV.

6. What is dispersion of light? Also describe the cause of dispersion of light.

   OR

   An object is placed 2 m in front of concave mirror of radius of curvature 40 cm. Find the position of the image.

7. What is photoelectric effect? State its laws?

8. State de Broglie hypothesis for matter waves and write the expression for de-Broglie wavelength.

   OR

   A photon of energy 8 eV is incident on a metal surface of threshold frequency 1.6×10^{15} Hz. What will be the kinetic energy of emitted photoelectrons? (Take $h = 6 \times 10^{-34}$ Js)

9. Natural radioactive nuclei are nuclei of high mass number. Why?

10. All the protons in an atom remain packed in a small nucleus in spite of the electrostatic repulsive force among them. Explain how.

11. Select the pairs of isobars and isotones from the following:

    $_{11}Na^{23}$, $_{12}Mg^{24}$, $_{12}Na^{24}$, $_{10}Ne^{23}$

12. Give any two points of difference between n-type and p-type semiconductor?

13. State the reason, why GaAs is most commonly used in making of a solar cell.

14. The refractive index of the material of an equi-double convex lens is 1.5. What is its focal length? (Radius of curvature = R)

OR

By using Huygens' Principle, prove the laws of refraction of light.

15. State radioactive decay law. Prove that radioactive decay is exponential in nature.

OR

On the basis of Bohr's atomic model, find and expression for the wave number of a wave emitted by an electron when it jumps from an outer orbit to inner orbit.

16. What is a rectifier? With the help of labelled circuit diagram explain the working of full wave rectifier.

17. With the help of labelled ray diagram, explain the formation of final image which is formed at least distance of distinct vision in case of astronomic telescope. Define its magnifying power and derive an expression for its magnifying power.

OR

(i) Which type of waves show the property of polarization?

(ii) State two conditions for two light sources to be coherent. Derive an expression for the fringe width in Young's double slit experiment for interference of light waves with suitable diagram.