MM:35 marks | Class XII (Physics) | Time: 1.5 Hour

1. What is unit of focal length? **1 mark**

a. Meter b. Diopter

c. Degree d. None of these

2. Which is Lens maker formula? **1 mark**

a. $\frac{1}{f} = \frac{n_1}{n_2 - n_1}\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$

b. $\frac{1}{f} = \frac{1}{u} - \frac{1}{v}$

c. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

d. $\frac{1}{f} = \frac{n_2 - n_1}{n_1}\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$

3. What is the wavelength of De-Broglie wave associated with an electron moving under potential difference of 100V? **1 mark**

a. 1.227 nm b. 0.1227 nm

c. 12.27 nm d. 1 nm

4. For which of following stopping potential is maximum. **1 mark**

a. Blue b. Red

c. Violet d. Yellow

5. For total internal reflection light must travel …… to……. **1 mark**

6. Air bubble in water behave like …… **1 mark**

7. Name any one effect of light which does not show its Particle nature …… **1 mark**

8. Which phenomenon illustrates the nature of light waves ……. **1 mark**

9. **Assertion**: when a narrow beam of white light passes through a glass Prism, it undergoes dispersion.

Reason: The refractive index of medium for different color is different. **1 mark**

1. Both assertion and reason are true and the reason is the correct explanation of assertion
2. Both assertion and reason are true but the reason is not the correct explanation of assertion
3. Assertion is true and the reason is false
4. Assertion is false and the reason is true

10. What is the de-Broglie wavelength of a bullet of mass 0.040 kg travelling at a speed of 1.0 km/s? **2 marks**

11. In Young's double slit experiment, the ratio of width of two slits is 4:1. Find the ratio of maximum or minimum intensities in the interference pattern. **2 marks**

12. Explain the Malus law in polarization. **2 marks**

13. What is the interference of light? Write two essential conditions for sustained interference of light. **3 marks**

14. Explain the effect of potential on the Photoelectric current by drawing a graph. **3 marks**

15. **Case Study Question** **4 marks**

According to wave picture of light is an EM- wave consisting of electric and magnetic fields with continuous distribution of energy over the region of space of wave. This wave nature did not explain the photoelectric effect. The e^-needs to be supplied with more energy than work function of material. We know Photoelectric emission is an instantaneous process. Photon is called quanta of energy.

Answer the following question based on the above passage:

a. The kinetic energy of the e^-emitted depends on which parameter?

b. Does the matter wave picture elegantly in corporated the Heisenberg's uncertainty principle.

c. How does amplitude of electric and magnetic field vary with intensity of radiation?

d. Is there any specific region of absorption of e^- on wavefront

or

Does photon get deflected by electric or magnetic fields?

16. Draw a ray diagram for compound microscope and find the expression for its magnifying Power.

Or

What is interference of light? Explain fringe width. How can it be increased? **5 Marks**

17. What are coherent sources of light. Derive mathematically the condition for constructive and destructive interference at an arbitrary point due to two coherent sources in term of phase difference ∅.

Or

What is meant by diffraction? Explain diffraction at a single slit. **5 Marks**