Krishnagar Academy

Pre-Annual Examination 2021-22

Class: X

Subject: Physics

FM 70

I. Choose the correct option [10]

Q1. A light ray does not bend at the boundary in passing from one medium to the other medium if the angle of incidence is

a. 0•

b. 45•

c. 60•

d. 90•

Q2. The highest refractive index is of

a. Glass

b. Water

c. Diamond

d. Ruby

Q3. A ray of light suffers refraction through an equilateral prism. The deviation produced by the prism does not depend on the

a. Angle of incidence

b. Colour of light

c. Material of prism

d. Size of prism

Q4. An object in a denser medium when viewed from a rarer medium appears to be raised. The shift is maximum for

a. Red light

b. Violet light

c. Yellow light

d. Green light

Q5. A total reflecting right angled isosceles prism can be used to deviate a Ray of light through

a. 30•

b. 60•

c. 75•

d. 90•

Q6. A Ray of light after refraction through a lens emerges parallel to the principal axis of the lens. The incident ray passes through

a.its optical centre

b. its first focus

c. its second focus

d. centre of curvature of the first surface

Q7. For the object placed between the optical centre and focus of a convex lens the image is

a. Real and enlarged

b. Real and diminished

c. Virtual and enlarged

d. Virtual and diminished

Q8. If the magnification produced by a lens is - 0.5 the correct statement is

a. The lens is concave

b. The image is virtual

c. The image is magnified

d. The image is real and diminished formed by a convex lens

Q9. The minimum distance between the source and the reflector in air to hear an echo is approximately

a. 10m

b. 17m

c. 34m

d. 50m

Q10. In the white light of Sun maximum scattering by the air molecules present in the earth's atmosphere is for

a. Red colour

b. Yellow colour

c. Green colour

d. Blue colour

II. Answer the following [60]

Q1. a.State two differences between light and sound waves. 2

b. State two factors on which the speed of a wave travelling in a medium depends.2.

c.State two applications of echo. 2

d. Name the waves used for sound ranging. State one reason for their use. 2

e. A person standing between the two vertical cliffs and 640 away from the nearest cliff produces sound .He hears the first Eco after 4 second and the second Eco 3 second letter.

i. calculate the speed of sound in air

ii. the distance between the cliffs. 2

Q2. a.Write down two differences between the image formed by a convex and a concave lens. 2

b. Aconverging lens forms the image of an object placed in front of it beyond 2F2 of the lens.

i. Where is the object placed?

ii. Draw a ray diagram to show the formation of image .

iii. State three characteristics of the image. (1+2+3)

c. A convex lens forms An erect and three times magnified image of an object placed at a distance 10cm in front of it. Find

i. the position of image

ii. the focal length of the lens . 2

Q3. a. Explain briefly with the help of a neat labelled diagram how does white light get dispersed by a Prism.

On which surface of prism there is both the dispersion and deviation of light and on which surface of prism there is only the division of light .(2+1+1)

b. Name two sources each of infrared radiation and ultraviolet radiation. 2

c. Name three properties of ultraviolet radiations which are similar to the visible light. 2

d. The danger signal is red .Why ? 2

Q4. a. Name two factors on which the refractive index of a medium depends. State how does it depend on the factors stated by you . (1+2)

b. What is lateral displacement ?Draw a ray diagram showing the lateral displacement of a Ray of light when it passes through a parallel sided glass slab.(1+2)

c. the refractive index of water with respect to air is 4/ 3 .What is the refractive index of air with

respect to water ? 2

d. Show the dependence of angle of deviation on the angle of incidence . 2

Q5.a.A Ray of light is normally incident on one face of an equilateral glass prism .Answer the following

i. what is the angle of incidence on the first face of the prism?

ii. what is the angle of refraction from the first face of the prism?

iii.what will be the angle of incidence at the second face of the prism ?

iv. will the light ray suffer minimum deviation by the prism ? 4

b. Acoin kept inside water (refractive index=4/3)when viewed from air in a vertical direction appears to be raised by 2mm .Find the depth of coin in water. 2

c. An object placed in one medium when seen from the other medium appears to be vertically shifted .Name two factors on which the magnitude of shift depends and state how does it depend on them . 2

d. Write down the essential conditions for the total internal reflection. 2

Q6.a. Write three differences between total internal reflection and reflection from a plane mirror . 3

b. Show with the aid of a ray diagram how a right angled isosceles prism can be used to invert the rays.

i. How should the rays fall on the prism?

ii.Which phenomenon is responsible for this action of prism ?

iii. what is the nature of the image in relation to the object? (2+1+1+1)

c.Draw a neat labelled diagram to show the total internal reflection of a ray of light normally incident on one face of a 30•, 90•, 60• prism. 2