ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

WORK SHEET: 37

Subject : PHYSICS

Date : 14.11.2020

CLASS : XII

Chapter- Refraction of light at plane surface.

Topic: Laws of Refraction, Refraction on parallel slab.

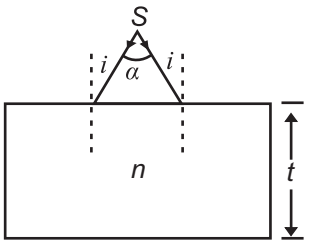
Multiple Choice Questions : **1 x 15 = 15**

1: Incident ray, normal at the point of incidence and refracted ray are always
(a) mutually perpendicular (b) inclined at acute angles (c) parallel (d) coplanar

2: A ray of light strikes an air-glass interface at an angle of incidence (i = 60°) and gets refracted at an angle of refraction r. On increasing the angle of incidence (i > 60°), the angle of refraction r
(a) decreases (b) remains same (s) is equal to 60° (d) increases

3: For the same angle of incidence, the angles of refraction in media *P*. *Q* and *R* are 35^0,$25^0$and 15^0 respectively. Which of the following relation hold true for the velocity of light in medium *P* , *Q* and R ?
(a) $v_p < v_Q < v_N$ (b) $v_p < v_R < v_Q$ (c) $v_p > v_Q > v_N$ (d) $v_p > v_R > v_Q$

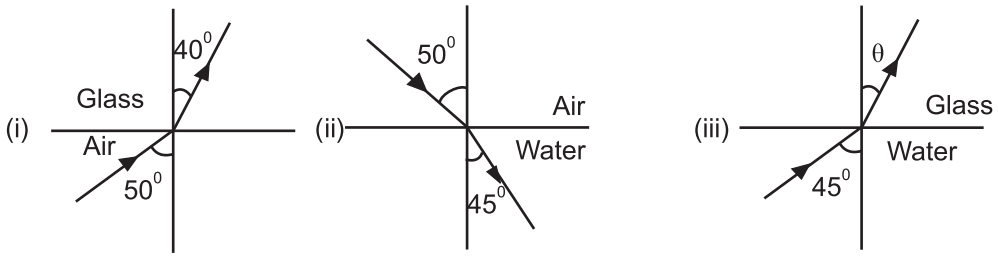
4: A divergent beam of light from a point sources *S* having divergence angle α falls symmetrically on a glass slab as shown in the figure. The angles of incidence of the two extreme rays are equal. If the thickness of the glass slab is *t* and its refractive index is *n*, then the divergence angle of the emergent beam is
(a) zero (b) α (c) $\sin^{-1}(1/n)$ (d) $2\sin^{-1}(1/n)$



5: A ray of light strikes a material's slab at an angle of incidence 60°. If the reflected and retracted rays are perpendicular to each other, then which of the given options is / are correct ?
(a) The angle of refraction is 45° (b) The angle of refraction is 30°
(c) The refractive index of the material is $\sqrt{3}$ (d) Both (b) and (c)

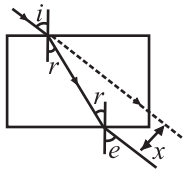
6: A ray of light strikes a transparent rectangular slab of refractive index $\sqrt{2}$ at an angle of incidence of 45° . The angle between the reflected and retracted ray is
(a) 75^0 (b) 90^0 (c) 105^0 (d) 120^0

7: As you can seen from Fig. (i) and (ii) shows refraction of light from air to glass and from air to water. Find out the value of the angle θ in the case of refraction as shown in figure (iii) will be



(a) 30^0 (b) 50^0 (c) 40^0 (d) 45^0

8: For refraction through a plane glass slab, dimension d is called
(a) refraction shift (b) lateral shift (c) emergency shift
(d) incidence shift



9: When an object lying in a denser medium is observe from rare medium, then real depth of object is
(a) more than that observed (b) less than that observed
(c) equal to observed depth (d) depends on angle of vision

10: A beaker contains water upto height h_1 and kerosen of hight h_2 above water so that the total height of (water + kerosene) is $(h_1 + h_2)$. Refractive index of water is μ_1 and that of kerosene is μ_2 .The apparent shift in position of the bottom of the beaker shown viewed from above is
(a) $(1 - 1/\mu_1)\, h_2 + (1 - 1/\mu_2)\, h_1$ (b) $(1 + 1/\mu_1)\, h_1 + (1 + 1/\mu_2)\, h_2$
(c) $(1 - 1/\mu_1)\, h_1 + (1 - 1/\mu_2)\, h_2$ (d) $(1 + 1/\mu_1)\, h_2 + (1 + 1/\mu_2)\, h_1$

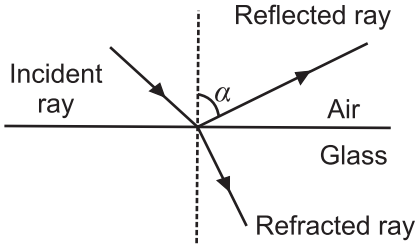
11: The ratio $\dfrac{\text{real depth}}{\text{apparent depth}}$ is equal to
(a) refractive index of denser medium with respect to air
(b) refractive index of denser medium with respect to rare medium
(c) refractive index of rare medium with respect to air
(d) refractive index of rare medium with respect to denser medium

12: A beaker of depth a is half filled with olive oil of refractive index μ_1 and the other half is filled with water of refractive index μ_2. The apparent depth of the beaker when viewed from above is
(a) $\dfrac{a(\mu_1 + \mu_2)}{2\mu_1\mu_2}$ (b) $\dfrac{a\,\mu_1\mu_2}{2(\mu_1 + \mu_2)}$ (c) $\dfrac{a\,\mu_1\mu_2}{(\mu_1 + \mu_2)}$ (d) $\dfrac{2a(\mu_1 + \mu_2)}{(\mu_1 + \mu_2)}$

13: A vessel is filled with water to a height of 13 cm. The apparent depth of a screw lying at the bottom of the vessel is measured by a microscope to be 8.5 cm. If water is replaced by a liquid of refractive index 1.70 upto the same height. Find the distance at which microscope have to be moved to focus on the screw again?
(a) 0.85 cm (b) 0.52 cm (c) 0.65 cm (d) 1.02 cm

14: Early sunrise and delayed sunset are caused due to
(a) bending of light rays towards centre of earth due to gravity
(b) bending of light rays away from centre of earth due to refraction
(c) bending of light rays towards centre of earth due to refraction
(d) scattering of light from molecules of gases and dust particles in atmosphere

15: A ray of light strikes an air-glass interface such that a part of it is reflected into air and the rest enters glass as shown in the figure given below.



If angle of refraction and refractive index of glass with respect to air is r and μ respectively. then value of a is
(a) r (b) $\mu \sin r$ (c) $\sin^{-1}(\mu \sin r)$ (b) $\sin^{-1}(\sin r / \mu)$