EL-MOASSER

April Tests

2026

هدية مجانية



PHYSICS

2nd SEC.

SECOND TERM

Test 1 Answered

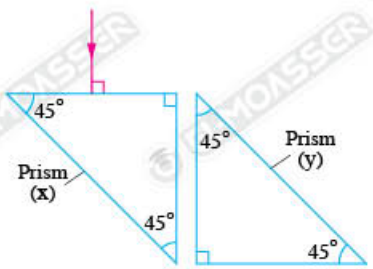
Choose the correct answer (1 : 12):

1 Which of the following colors of visible light when passing through an aperture with dimensions of 10^{-5} m has the most noticeable diffraction?

(a) Red (b) Yellow (c) Green (d) Blue

2 In the opposite figure, there are two reflecting prisms (x) and (y). When the light ray emerges from prism (y), its path will change by an angle of ..... .

(a) 180° (b) 45°
(c) 90° (d) 0°



3 A body undergoes a uniform circular motion along a circular path with a constant radius. Which of the following graphs represents the relationship between the centripetal force (F_c) acting on the body and its tangential velocity (v)?



(a) (b) (c) (d)

4 The wavelengths of a light ray in two media x and y are 5500 Å and 4000 Å respectively, then the critical angle between the two media equals ..... .

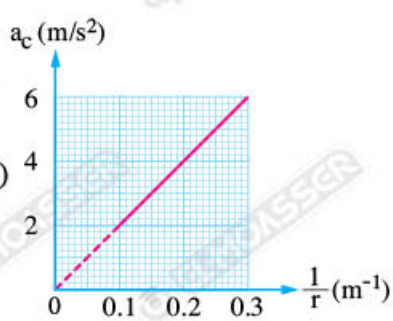
(a) 11.43° (b) 43.11° (c) 46.66° (d) 89.46°

5 If the distance between the center of the first bright fringe and the center of the central fringe in Young's experiment is 2 mm, so the distance of the center of the third dark fringe from the center of the central fringe is equal to ..... .

(a) 2 mm (b) 5 mm (c) 6 mm (d) 7 mm

6 A body moves with the same speed in several horizontal circular paths of different radii and the opposite graph shows the relationship between the centripetal acceleration (a_c) and the reciprocal of path radius $\left(\frac{1}{r}\right)$, so the tangential velocity (v) with which the body moves is equal to ..... .

(a) 4.47 m/s (b) 5.58 m/s
(c) 3.13 m/s (d) 9.8 m/s



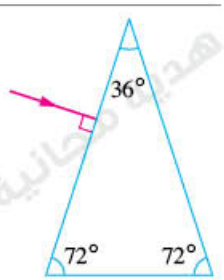
7 A light ray falls with an angle of incidence ϕ on one of the faces of a triangular prism whose apex angle is 75° and its refractive index is $\sqrt{2}$, and emerges tangent to the opposite face, so the value of ϕ is ..... .

(a) 0° (b) 30°
(c) 45° (d) 60°

8 Two bodies with masses 8 kg and 20 kg, and the distance between their centers is 0.2 m. If you know that the universal gravitational constant is G, then the gravitational force between them in newtons equals ..... .

(a) 800 G (b) 4000 G
(c) 400 G (d) 8000 G

9 The opposite figure represents a light ray falling on one of the faces of a triangular prism whose material has a refractive index of 1.8, so the number of total internal reflections inside the prism is ..... .



(a) 1 (b) 2
(c) 3 (d) 4

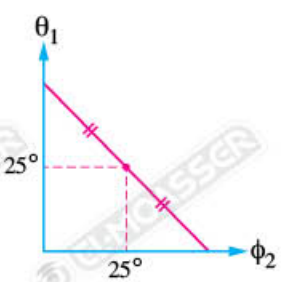
10 In Young's double-slit experiment, when increasing the intensity of the used light, the distance between the center of the central fringe and that of the first dark fringe ..... .

(a) increases (b) decreases
(c) vanishes (d) doesn't change

11 An object with a mass of 6 kg moves around the center of a circle with a circumference of 10π m at a uniform speed of 10 m/s, so the centripetal force acting on the object is ..... .

(a) 50 N (b) 20 N (c) 120 N (d) 100 N

12 The opposite graph represents the relationship between the first angle of refraction (θ_1) and the second angle of incidence (ϕ_2) for a light ray passing through a glass triangular prism, so the apex angle of the prism equals ..... .



(a) 25° (b) 45°
(c) 50° (d) 60°

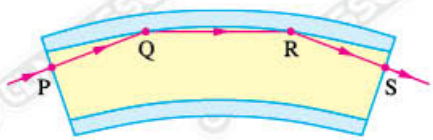
Answer the following questions (13 : 15):

13 **What happens when** a beam of parallel rays of white light falls on a triangular prism adjusted in the minimum deviation position?.

.....

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14 A light ray travels through an optical fiber as shown in the opposite figure,



explain why:

(a) The direction of the beam does not change at each of points S and P.

(b) There is total reflection at each of points Q and R.

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15 A body weighs 45 N at the Earth's surface. **Calculate** its weight at a height above the Earth's surface equal to a quarter of Earth's diameter.

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Test 2 Answered

Choose the correct answer (1 : 12):

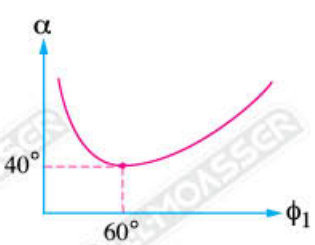
1 As the differences in temperature between air layers near the Earth's surface decrease, the probability of the mirage phenomenon occurring ..... .

(a) decreases (b) increases
(c) does not change (d) cannot be determined

2 The fringe adjacent to the central fringe in Young's double-slit experiment ..... .

(a) is always bright
(b) is always dark
(c) has a type depending on the medium
(d) has a type depending on the wavelength of the used light

3 The opposite graph represents the relationship between the angle of deviation (α) of a light ray passing through a triangular prism and the angle of incidence (ϕ_1) of this ray on one of the prism faces, so the apex angle of the prism and the refractive index of its material for the incident light, respectively, are ..... .

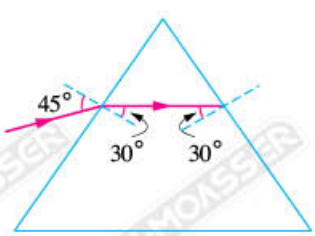


(a) 60°, 1.5 (b) 80°, 1.45 (c) 75°, 1.5 (d) 80°, 1.35

4 At what approximate height above the Earth's surface does the strength of the Earth's gravitational field decrease by 1% compared to its value at the Earth's surface? (Given that: R = 6400 km)

(a) 60 km (b) 64 km (c) 30 km (d) 32 km

5 The opposite figure represents a light ray passing through an equilateral triangular prism whose refractive index is $\sqrt{2}$, so the value of the angle of deviation for the light ray is ..... .

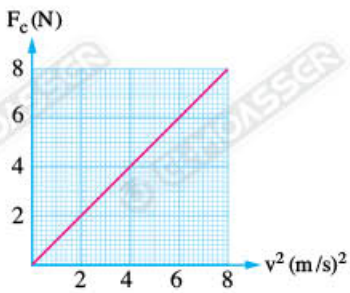


(a) 30° (b) 45°
(c) 55° (d) 60°

6 If you know that the acceleration due to gravity on the surface of the Moon is one-sixth of the acceleration due to gravity on the surface of the Earth, then the ratio between the universal gravitational constant on the Earth's surface and the universal gravitational constant on the Moon's surface, respectively, equals ..... .

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) 1 (d) 6

7 The opposite graph represents the relationship between the centripetal force (F_c) acting on a body of mass 2 kg moving in uniform circular motion and the square of the linear velocity (v^2) with which the body moves, so the radius of the circular path in which the body moves equals ..... .



(a) 0.2 m (b) 0.5 m (c) 2 m (d) 4 m

8 If the speed of light in air is 3×10^8 m/s and in another medium is 1.33×10^8 m/s, the critical angle of that medium with air equals ..... .

(a) 26.32° (b) 32.26° (c) 63.68° (d) 68.63°

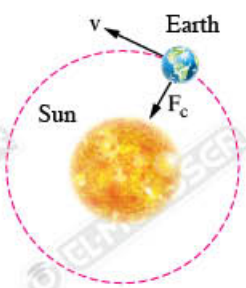
9 The ratio between the first angle of refraction and the angle of emergence in a triangular prism in the position of minimum deviation $\left(\frac{\theta_1}{\theta_2}\right)$ is ..... .

(a) greater than one (b) less than one (c) equal to one (d) not determinable

10 In a double-slit experiment, a student used a laser beam with a wavelength of 632.8 nm and placed the screen for receiving the interference fringes at a distance of 1 m from the double-slit barrier, so he found that the distance between the center of the first bright fringe and the center of the central fringe was 3.2 mm, hence the distance separating the two slits is approximately ..... .

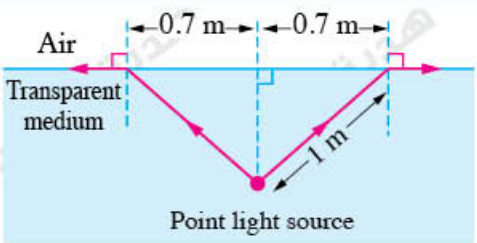
(a) 19.8 mm (b) 198 μm (c) 50.6 mm (d) 506 μm

11 The opposite figure expresses the motion of the Earth around the Sun in a circular path, so the angle between the directions of the centripetal acceleration and the centripetal force (F_c) is equal to..... .



(a) 0° (b) 90°
(c) 180° (d) 270°

12 The opposite figure shows some light rays emitted from a point light source placed inside a transparent medium, so the refractive index of this medium is ..... .



(a) 1.4 (b) 1.7

(c) 1.8 (d) 2

Answer the following questions (13 : 15):

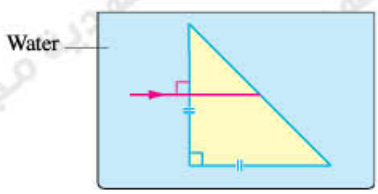
13 **Explain:** there is no essential difference between the phenomena of interference and diffraction of light.

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14 In the opposite figure:

Trace the path of the incident light ray till it emerges from the prism, where the critical angle of the prism's material with air is 42° and the absolute refractive index of water is 1.33.



.....

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15 When whirling a stone attached to the end of a string in a horizontal circular path at constant speed. **What** is the direction of the force acting on it that keeps it moving in its circular path? **What** is the direction of the stone's motion at the instant the string breaks?

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Answers of April Tests

Answers of Test 1

Question no.	1	2	3	4	5	6	7	8
Answer	a	d	a	c	b	a	c	b

Question no.	9	10	11	12
Answer	c	d	c	c

13 Light emerges dispersed into the seven colors of the spectrum.

14 **(a)** Because the light ray is incident perpendicular to the interface.

(b) Because the ray is incident from a medium with higher optical density onto the interface between the two layers at an angle of incidence greater than the critical angle.

15 $r_2 = r_1 + h = R + \left(\frac{1}{4} \times 2R\right) = \frac{3}{2} R$

$\because w = mg$

$\because g = G\frac{M}{r^2}$ $\quad\therefore w = G\frac{mM}{r^2}$

$\therefore \frac{w_1}{w_2} = \frac{r_2^2}{r_1^2}$, $\frac{45}{w_2} = \frac{\frac{9}{4}R^2}{R^2}$

$\therefore w_2 = 20$ N

Answers of Test 2

Question no.	1	2	3	4	5	6	7	8
Answer	a	b	d	d	a	c	c	a

Question no.	9	10	11	12
Answer	b	b	a	a

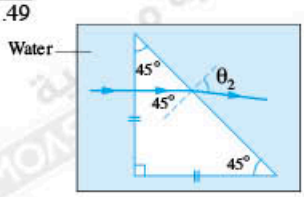
13 Because both of them are wave phenomena resulting from the superposition of waves.

14 The refractive index of the prism:

$n_1 = \frac{1}{\sin \phi_c} = \frac{1}{\sin 42} = 1.49$

In water : $\sin \phi_c = \frac{n_2}{n_1} = \frac{1.33}{1.49}$

$\phi_c = 63.2°$



$A = \theta_1 + \phi_2$

$45 = 0 + \phi_2$

$\phi_2 = 45°$

By comparing the second angle of incidence (ϕ_2) to the critical angle between the prism material and water (ϕ_c) we find that:

$\phi_2 < \phi_c$

$\therefore$ The ray gets refracted and emerges from the prism by an angle θ_2

Applying Snell's law:

$\because n_1 \sin \phi_2 = n_2 \sin \theta_2$

$\therefore 1.49 \times \sin 45 = 1.33 \times \sin \theta_2$

$\theta_2 = 52.39°$

15 • The force that keeps the stone in its circular path acts in a direction perpendicular to the direction of its motion, toward the center of the circular path.

• At the moment the string breaks, the stone moves tangentially to the circular path at the point where the break occurred.