PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 49

Physics

1. A dip needle lies initially in the magnetic merdian when it shows an angle of dip θ at a place. The dip circle is rotated through an

angle x in the horizontal plane and then it shows an angle of dip θ'. Then $\frac{\tan\theta'}{\tan\theta}$ is

A. $\frac{1}{\cos x}$

B. $\frac{1}{\sin x}$

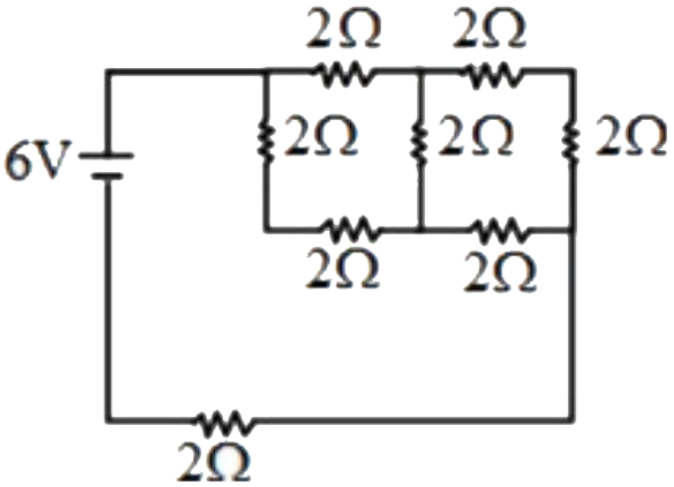
C. $\frac{1}{\tan x}$

D. cos x

Answer: A

Watch Video Solution

2. What is the current drawn from the battery of 6 V ?



A. 125 A

B. 12.5 A

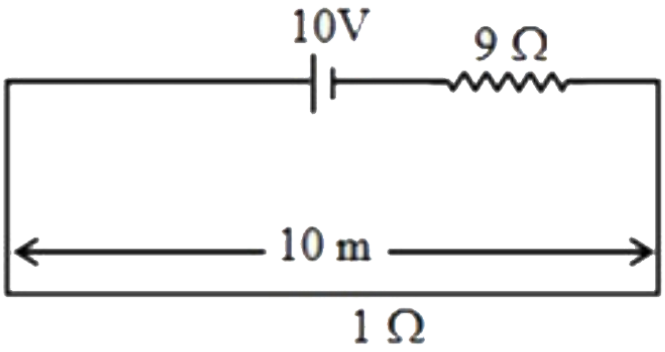
C. 1.25 A

D. 2.5 A

Answer: C

Watch Video Solution

3. If a ideal battery of e.m.f.10 V is connected with external resistance 9Ω and a wire of length 10 m and resistance 1Ω in series as shown in potentiometer wire



A. 1 V/m

B. 0.1 V/m

C. 0.01 V/m

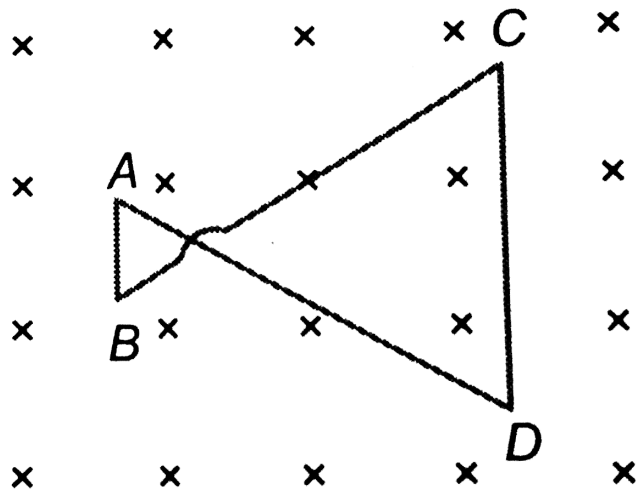
D. 10 V/ m

Answer: B

Watch Video Solution

4. A conducting wire frame is placed in a magnetic field which is directed into the paper. The magnetic field is increasing at a constant

rate. The direction of induced current in wire AB and CD are



A. A to B and C to D

B. B to A and C to D

C. A to B and D to C

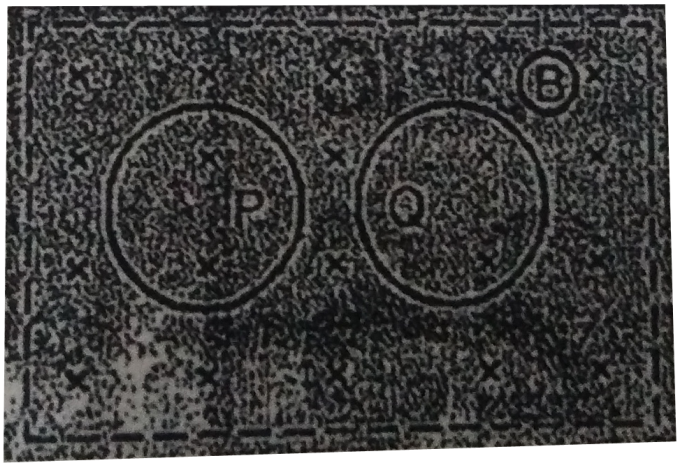
D. B to A and D to C

Answer: D

Watch Video Solution

5. P and Q are two circular thin coils of same radius and subjected to the same rate of change of flux. If coil P is made up of copper and Q is made up of iron, Then the wrong

statement is-



A. emf induced in the two coils is the same

B. the induced current in P is more than that in Q

C. the induced current in P ans Q are in the same direction .

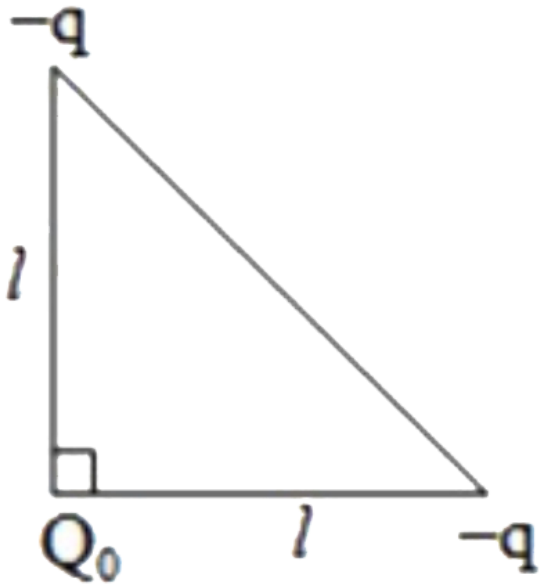
D. the induced currents are the same in both the coils

Answer: D

Watch Video Solution

6. Three charges Q_0 - q and q are placed at the vertices of an isosceles right angle triangle as in the future. The net electrostatic potential

energy is zero if Q_0 is equal to



A. $\frac{q}{4}$

B. $\frac{q}{\sqrt{8}}$

C. $\sqrt{2}q$

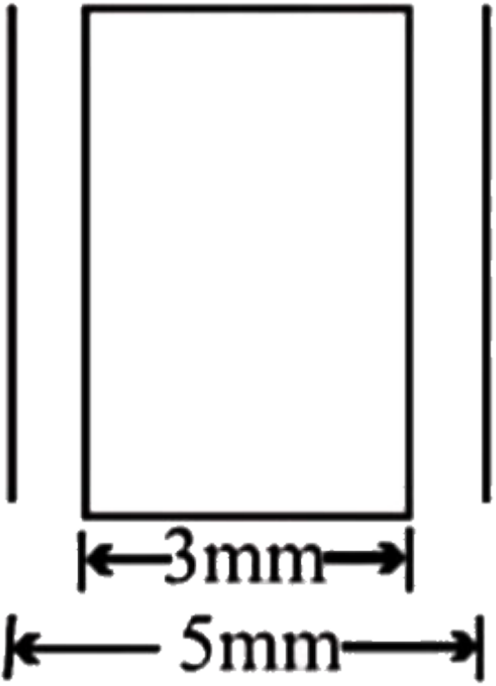
D. q

Answer: B

Watch Video Solution

7. Separation between the plates of parallel plate capacitor is 5 mm. this capacitor, having air as the dielectric medium between the plates, is charged to a potential difference 25 V using a battery. The battery is then disconnected and a dielectric slab of thickness 3mm and dielectric constant K=10 is placed between the plates as shown. potential

difference between the plates after the dielectric slab has been introduced is-



A. 18.5 V

B. 13.5 V

C. 11.5 V

D. 6.5 V

Answer: C

Watch Video Solution

8. When a charged particle moving with velocity $\overrightarrow{V}$ is subjected to a magnetic field of induction $\overrightarrow{B}$ the force on it is non-zero. This implies that:

A. angle between $\vec{v}$ and $\vec{B}$ is either zero or 180°

B. angle between $\vec{v}$ and $\vec{B}$ is necessarily 90°

C. angle between $\vec{v}$ and $\vec{B}$ is can have any value other than 90°

D. angle between $\vec{v}$ and $\vec{B}$ is can have any value other than zero and 180°

Answer: D

Watch Video Solution

9. An electron enters a magnetic field along perpendicular direction. Following quantity will remain constant -

A. momentum

B. kinetic energy

C. velocity

D. all of the above

Answer: B

Watch Video Solution

10. The spectral energy distribution of the sun (temperature = 6050 K) has a maximum at 4753Å The temperature of a star for which this maximum is at 9506Å is

A. 6050 K

B. 3025 K

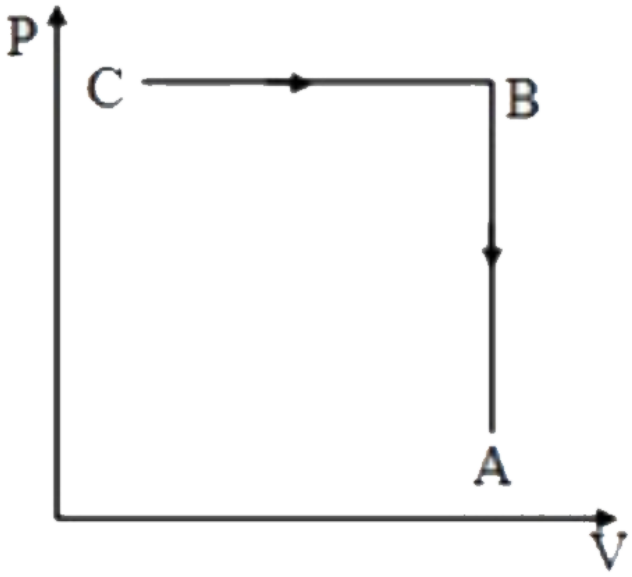
C. 12100 K

D. 24200 K

Answer: B

Watch Video Solution

11. Ideal gas is taken through a process as shown in figure



A. in process AB, work done by system is positive

B. in process AB, heat is rejected out of the system

C. in process AB, internal energy increases

D. all of the above

Answer: B

Watch Video Solution

12. If specific heat of a substance is infinite, it means

A. heat is given out

B. heat is taken in

C. no change in temperature takes place whether heat is taken in or given out

D. all of these

Answer: C

 Watch Video Solution

13. An ideal monatomic gas undergoes process $PV^{1.25}$ = constant .Then

A. upon increase in pressure temperature decreases

B. upon increase in pressure heat is absorbed by gas

C. if heat is given to gas its internal energy increases

D. heat is absorbed by gas if volume increases

Answer: D

Watch Video Solution

14. Two spheres of same metal have the same volume. But one is solid and the other is hollow, when the change in temperature of both of them is same, which of the following

statements about the change in their diameters is true?

A. it will be more for hollow sphere

B. it will more for solid sphere

C. it will be same for both spheres

D. it may be more or less depending on the ratio of the diameters of the two spheres

Answer: C

 Watch Video Solution

15. If temperature scale is changed from $'^{\circ} C$ to $'^{\circ} F$, the numerical value of specific heat

A. increase

B. decrease

C. remains unchanged

D. none of these

Answer: B

Watch Video Solution

16. A string of 7 m length has a mass of 0.035 kg. If tension in the string is 60.5 N, then speed of a wave on the string is :

A. 77 m/s

B. 102 m/s

C. 110 m/s

D. 165 m/s

Answer: C

 Watch Video Solution

17. The distance travelled by a particle is proportional to the squares of time, then the particle travels with

A. uniform acceleration

B. uniform velocity

C. increasing acceleration

D. decreasing velocity

Answer: A

Watch Video Solution

18. The range of a projectile, when launched at an angle of 15° with the horizontal is 1.5 km. what is the range of the projectile, when launched at an angle of 45° to the horizontal with the same speed ?

A. 0.75 km

B. 1.5 km

C. 3.0 km

D. 6.0 km

Answer: C

Watch Video Solution

19. A 60 kg body is pushed with just enough force to start it moving across a floor and the same force continues to act afterwards. The coefficient of static friction and sliding friction are 0.5 and 0.4 respectively. The acceleration of the body is

A. $6ms^{-2}$

B. $4.9ms^{-2}$

C. $3.92ms^{-2}$

D. $1ms^{-2}$

Answer: D

Watch Video Solution

20. A metal ball hits a wall and does not rebound whereas a rubber ball of the same mass on hitting the wall the same velocity rebounds back. It can be concluded that–

A. metal ball suffers greater change in momentum

B. rubber ball suffers greater change in momentum .

C. the initial momentum of metal ball is greater than the initial momentum of rubber ball.

D. both suffer same change in momentum .

Answer: B

 Watch Video Solution

21. Two spherical bodies of masses m and 6m and radii R and 2R respectively are released in free space with initial separation between their centres equal to 10 R . If they attract each other due to gravitational force only , then the distance covered by smaller sphere just before collisions will be

A. 6 R

B. 7.5 R

C. 2.5 R

D. 9 R

Answer: A

 Watch Video Solution

22. A solid cube of the edge a is molten and moulded in eight identical small solid cubes and are placed on one other on a straight line with the edge of the bottom cube on the same horizontal plane on which big cube was placed , then the vertical shift in the centre of mass is

A. $\frac{3a}{2}$

B. 2a

C. $\frac{5a}{2}$

D. 3a

Answer: A

Watch Video Solution

23. A projectile is fired with velocity.v_0 at an angle 60° with horizontal . At top of its trajectory it explodes into two fragments of

equal mass. If one fragment retraces the path then the speed of the other fragment is

A. $2v_0$

B. $\frac{5v_0}{2}$

C. v_0

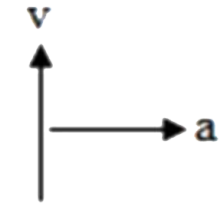
D. $\frac{3v_0}{2}$

Answer: D

Watch Video Solution

24. Show here are the velocity and acceleration vectors for an object in several different types of motion. In which case is the object slowing down and turning to the left ?

A.



B.

C. 

D. 

Answer: B

Watch Video Solution

25. A comet of mass 10^8 kg travels around the sun in an elliptical orbit . When it is closed to the sun it is 2.5×10^{11} m away and its speed

is $2 \times 10^4 ms^{-1}$ Find the change in kinetic energy when it is farthest from the sun and is 5×10^{10} m away from the sun

A. $38 \times 10^8 J$

B. $48 \times 10^8 J$

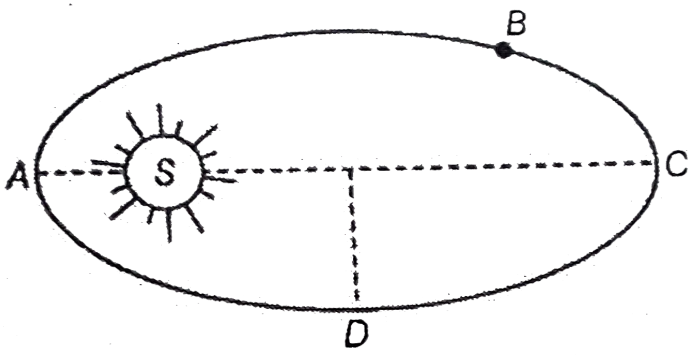
C. $58 \times 10^8 J$

D. $56 \times 10^8 J$

Answer: B

Watch Video Solution

26. A planet revolves in elliptical orbit around the sun. (see figure). The linear speed of the planet will be maximum at



A. A

B. B

C. C

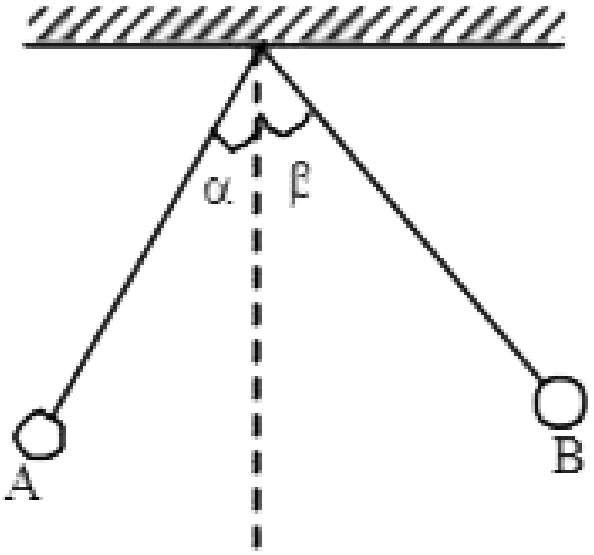
D. D

Answer: A

Watch Video Solution

27. Two identical simple pendulums A and B are fixed at same point. They are displaced by very small angles α and $\beta(\beta > \alpha)$ and released from rest. Find the time after which B reaches its initial position for the first time.

Collisions are elastic and length of strings is l.



A. $\pi\sqrt{\frac{l}{g}}$

B. $2\pi\sqrt{\frac{l}{g}}$

C. $\frac{\pi\beta}{\alpha}\sqrt{\frac{l}{g}}$

D. $\frac{2\pi\beta}{\alpha}\sqrt{\frac{l}{g}}$

Answer: B

Watch Video Solution

28. The equation of S.H.M. of a particle is $a + 4\pi^2 x = 0$, where a is instantaneous linear acceleration at displacement x. Then the frequency of motion is

A. 1 Hz

B. $4\pi Hz$

C. $\frac{1}{4} Hz$

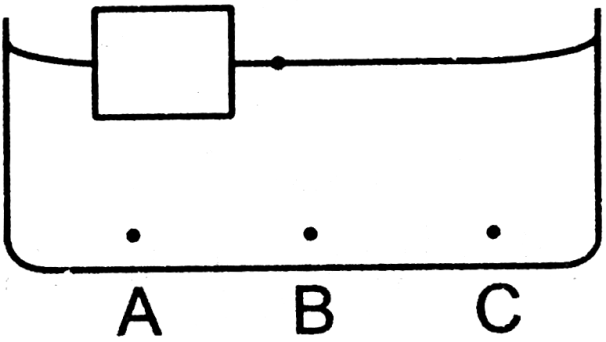
D. 4 Hz

Answer: A

Watch Video Solution

29. A wooden object floats in water kept in as beaker. The object is near a side of the beaker figure. Let P_1, P_2, P_3 be the pressure at the three points A,B and C of the bottom as shown

in the figure.



A. $P_1 = P_2 = P_3$

B. $P_1 < P_2 < P_3$

C. $P_1 > P_2 > P_3$

D. $P_1 = P_2 \neq P_3$

Answer: A

Watch Video Solution

30. In the bottom of a vessel with mercury of density ρ there is a round hole of radius r. At what maximum height of the mercury layer will the liquid still not flow out through this hole. (Surface tension = T)–

A. $\frac{T}{r\rho g}$

B. $\frac{T}{2r\rho g}$

C. $\frac{2T}{r\rho g}$

D. $\frac{4T}{r\rho g}$

Answer: C

Watch Video Solution

31. The moment of inertia of a solid sphere of radius R about its diameter is same as that of a disc of radius 2R about its diameter. The ratio of their masses is

A. $5:2$

B. $5:8$

C. $4:1$

D. $2:1$

Answer: A

Watch Video Solution

32. A man weighing $80kg$ is standing on a trolley weighting $320kg$. The trolley is resting on frictionless horizontal rails. If the man starts walking on the trolley along the rails at speed $1m/s$ (w.r.t. to trolley) then after $4s$ his displacement relative to the ground will be :

A. 5 m

B. 4.8 m

C. 3.2 m

D. 3 m

Answer: C

Watch Video Solution

33. In Rutherford experiment α – particles are scattered by nucleus having change $100e^{-}$

Initial kinetic energy of α - particles is 6 MeV .

The size of the nucleus is

A. $10^{-14}m$

B. $3 \times 10^{-14}m$

C. $10^{-13}m$

D. $10^{-16}m$

Answer: B

Watch Video Solution

34. The shortest wavelength of the Brackett series of a hydrogen-like atom (atomic number of Z) is the same as the shortest wavelength of the Balmer series of hydrogen atom. The value of z is

A. 2

B. 3

C. 4

D. 6

Answer: A

Watch Video Solution

35. Half-lives of two radioactive substances A and B are respectively 20 minutes and 40 minutes. Initially, he sample of A and B have equal number of nuclei. After 80 minutes the ratio of the remaining number of A and B nuclei is :

A. $1:16$

B. $4:1$

C. $1:4$

D. $1:1$

Answer: C

Watch Video Solution

36. Light of wavelength $400nm$ is incident continuously on a Cesium ball. (work function $1.9eV$). The maximum potential to which the ball will be charged is

A. 3.1 V

B. 1.2 V

C. zero

D. infinite

Answer: B

Watch Video Solution

37. When a metallic surface is illuminated with monochromatic light of wavelength λ, the stopping potential is $5V_0$. When the same surface is illuminated with the light of

wavelength 3λ, the stopping potential is V_0. Then, the work function of the metallic surface is

A. $\frac{hc}{6\lambda}$

B. $\frac{hc}{5\lambda}$

C. $\frac{hc}{4\lambda}$

D. $\frac{2hc}{4\lambda}$

Answer: A

Watch Video Solution

38. $\overline{A.\overline{B}+\overline{A}.B}$ is equivalent to

A. $A.\overline{B}+\overline{A}.B$

B. $\left(A+\overline{B}\right)\left(\overline{A}+B\right)$

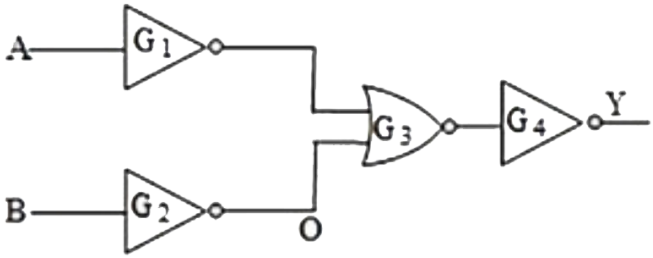
C. $\overline{A.\overline{B}+\overline{A}.B}$

D. $(A+B).\left(\overline{A}+B\right)$

Answer: B

Watch Video Solution

39. The combination of gates shown below produces



A. AND gate

B. XOR gate

C. NOR gate

D. NAND gate

Answer: D

Watch Video Solution

40. To use a transistor as an amplifier

A. emitter - base junction is forward biased and collector - base junction is reverse biased

B. both junctions are forward biased.

C. both junctions are reverse biased.

D. it does not matter how transistor is biased , it always works as an amplifier.

Answer: A

 Watch Video Solution

41. A transistor have a β a equal to 80 has a change in base current of 250μ ampere, then the change in collector current is

A. $170\mu A$

B. $330\mu A$

C. $3.125\mu A$

D. 20 mA

Answer: D

 Watch Video Solution

42. The angle of minimum deviation produced by an equilateral prism is 46° The refractive index of material of the prism.

A. 1.6

B. 1.5

C. 1.4

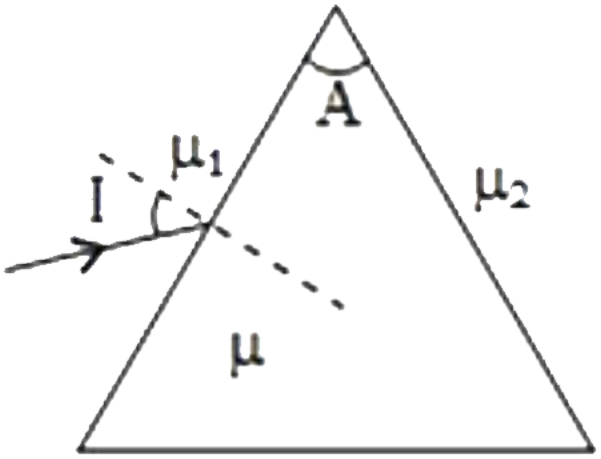
D. 1.8

Answer: A

Watch Video Solution

43. A thin prism has different medium on its either side. A light ray is incident almost normally on the first face. What is the angle of

deviation if all the angles are very small



A. $I\left(1-\frac{\mu_1}{\mu_2}\right)-A\left(1-\frac{\mu}{\mu_2}\right)$

B. $I\left(1-\frac{\mu_1}{\mu_2}\right)+A\left(1-\frac{\mu}{\mu_2}\right)$

C. $I\left(1-\frac{\mu_1}{\mu_2}\right)-A\left(1-\frac{\mu}{\mu_2}\right)$

D. none of these

Answer: A

Watch Video Solution

44. In a Fraunhofer diffraction experiment at a single slit using a light of wavelength 400 nm, the first minimum is formed at an angle of 30°. The direction θ of the first secondary maximum is given by :

A. $\tan^{-1}\left(\frac{4}{3}\right)$

B. 60°

C. $\sin^{-1}\left(\frac{3}{4}\right)$

D. $\tan^{-1}\left(\frac{3}{4}\right)$

Answer: C

Watch Video Solution

45. When interference of light takes place

A. energy is created in the region of maximum intensity

B. energy is destroyed in the region of maximum intensity

C. conservation of energy holds good and energy is redistributed

D. conservation of energy does not hold good

Answer: C

 Watch Video Solution