PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 54

Physics

1. Time periods of vibration of two bar magnets in sum and difference positions are 4

s and 6 s respectively . The ratio of their magnetic moments $\frac{M_1}{M_2}$ is

A. $6:4$

B. $36:16$

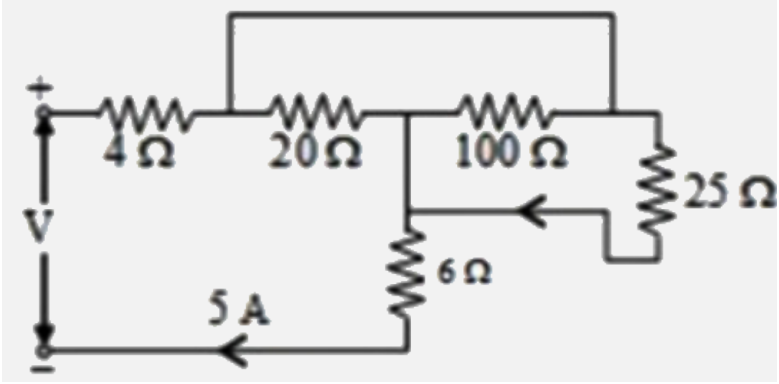
C. $2.6:1$

D. $1.5:1$

Answer: C

Watch Video Solution

2. In the circuit shown in the figure , V must be



A. 50 V

B. 100 V

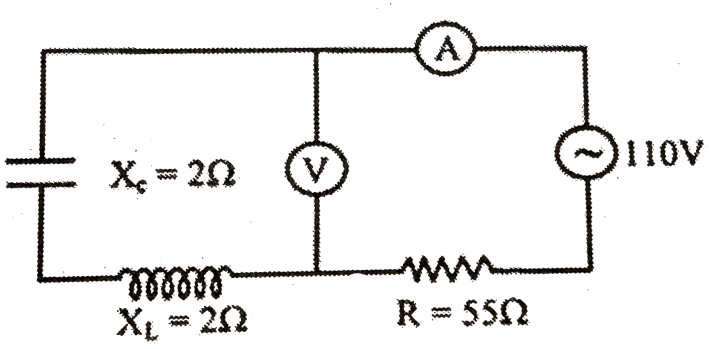
C. 75 V

D. 25 V

Answer: B

Watch Video Solution

3. The reading of the ammeter and voltmeters are (Both the instruments are ac meters and measures rms value)-



A. 2 A , 110 V

B. 2 A , 0 V

C. 2 A , 55 V

D. 1 A , 0 V

Answer: B

 Watch Video Solution

4. An inductor coil stores 32 J of magnetic field energy and dissiopates energy as heat at the rate of 320 W when a current of 4 A is passed through it. Find the time constant of the

circuit when this coil is joined across on ideal battery.

A. 0.2 s

B. 0.3 s

C. 0.4 s

D. 0.5 s

Answer: A

Watch Video Solution

5. A circular ring of radius R and uniform linear charge density $+\lambda C/m$ are kept in x - y plane with its centre at the origin. The electric field at a point $\left(0, 0, \frac{R}{\sqrt{2}}\right)$ is

A. $\frac{\lambda}{3\sqrt{3}\varepsilon_0 R}$

B. $\frac{2\lambda}{3\sqrt{3}\varepsilon_0 R^2}$

C. $\frac{2}{3\sqrt{3}}\frac{\lambda}{\varepsilon_0 R}$

D. none the these

Answer: A

Watch Video Solution

6. The electric potential at. Point A is 20 V and B is – 20 . The work done by an external force in moving electron slowly from B to A is

A. $-6.4 \times 10^{-18} J$

B. $+6.4 \times 10^{-18} J$

C. $4 \times 10^{-20} J$

D. $-4 \times 10^{-20} J$

Answer: A

Watch Video Solution

7. A charged particle moves through a magnetic field perpendicular to its direction. Then

A. the momentum changes but the kinetic energy is constant

B. both momentum and kinetic energy of the particle are not constant

C. both , momentum and kinetic energy of the particle are constant

D. kinetic energy changes but the momentum is constant

Answer: A

Watch Video Solution

8. A charged particle enters a uniform magnetic field with velocity vector at angle of 45° with the magnetic field. The pitch of the

helical path followed by the particle is p. the radius of the helix will be

A. $\frac{p}{\sqrt{2}\pi}$

B. $\sqrt{2}p$

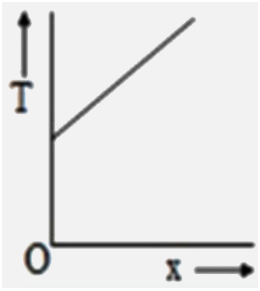
C. $\frac{p}{2\pi}$

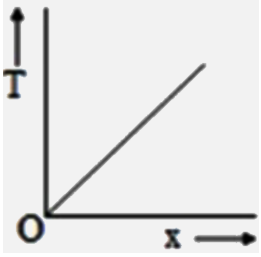
D. $\frac{\sqrt{2}p}{\pi}$

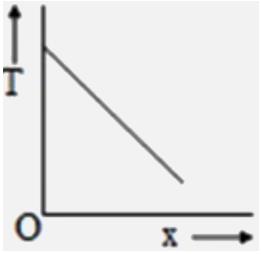
Answer: C

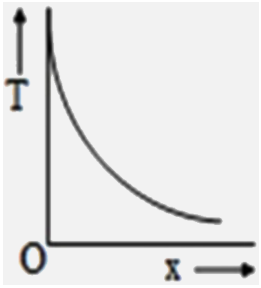
Watch Video Solution

9. A conductor of length L is placed along the x - axis , with one of its ends at x = 0 and the other at x = L. If the rate of flow of heat energy through the conduct is constant and its thermal resistance per unit length is also constant , then Which of the following graphs is/are correct ?

A. 

B. 

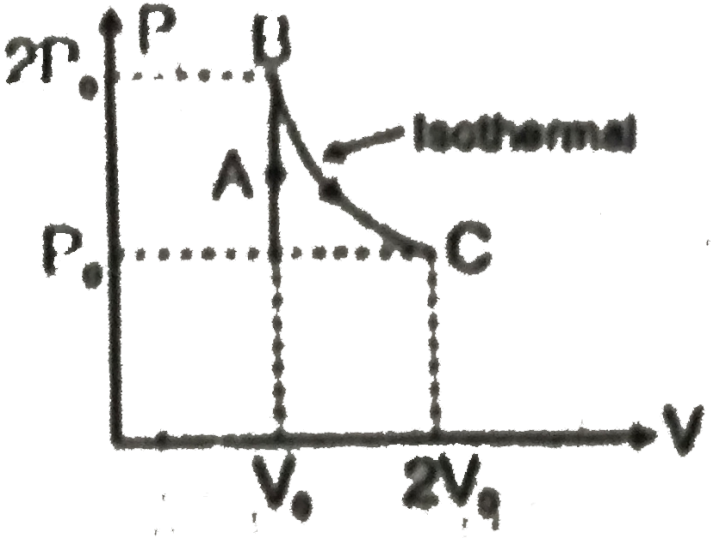
C. 

D. 

Answer: C

Watch Video Solution

10. A diatomic ideal gas undergoes a thermodynamic change according to the P-V diagram shown in the figure. The total heat given to the gas is nearly (use ln2=0.7):



A. $2.5P_0V_0$

B. $1.4P_0V_0$

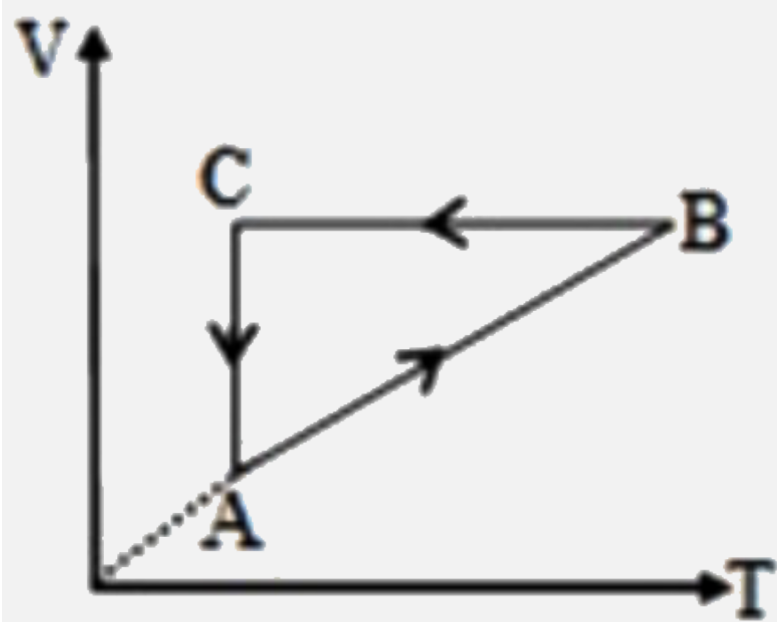
C. $39P_0V_0$

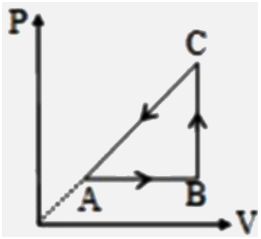
D. $1.1P_0V_0$

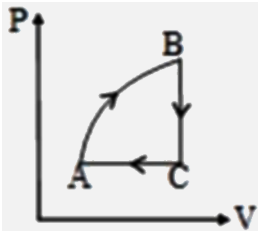
Answer: C

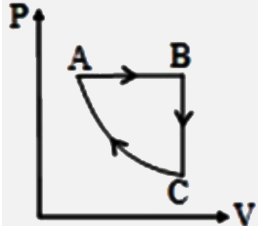
Watch Video Solution

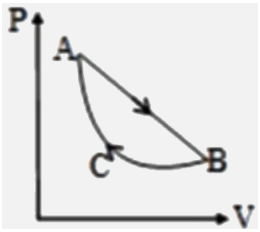
11. A cyclic process ABCA is shown in the V - T diagram . Process on the P – V diagram is



A. 

B. 

C. 

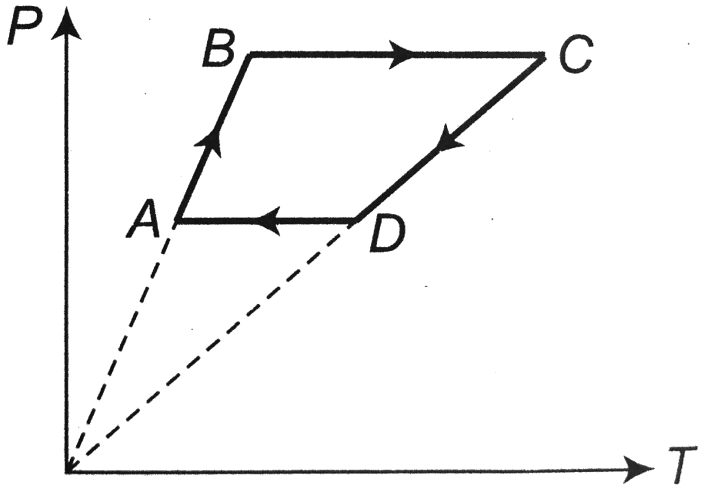
D. 

Answer: C

Watch Video Solution

12. Six moles of an ideal gas performs a cycle shown in figure. If the temperature are $T_D = 600K,\ T_B = 800K,\ T_C = 2200K$ and

$T_D = 1200K$, the work done per cycle is



A. 20 kJ

B. 30 kJ

C. 40 kJ

D. 60 kJ

Answer: C

Watch Video Solution

13. A metal ball immersed in water weighs w_1 at $0^\circ C$ and w_2 at $50^\circ C$. The coefficient of cubical expansion of metal is less than that of water. Then

A. $w_1 > w_2$

B. $w_1 < w_2$

C. $w_1 = w_2$

D. data is insufficient

Answer: B

Watch Video Solution

14. If there is no heat loss, the heat released by the condensation of x gram of steam at $100^\circ C$ into water at $100^\circ C$ can be used to convert y gram of ice at $0^\circ C$ into water at $100^\circ C$. Then the ratio of y:x is nearly [Given $L_l = 80cal/gm$ and $L_v = 540cal/gm$]

A. $1:1$

B. $2:1$

C. $3:1$

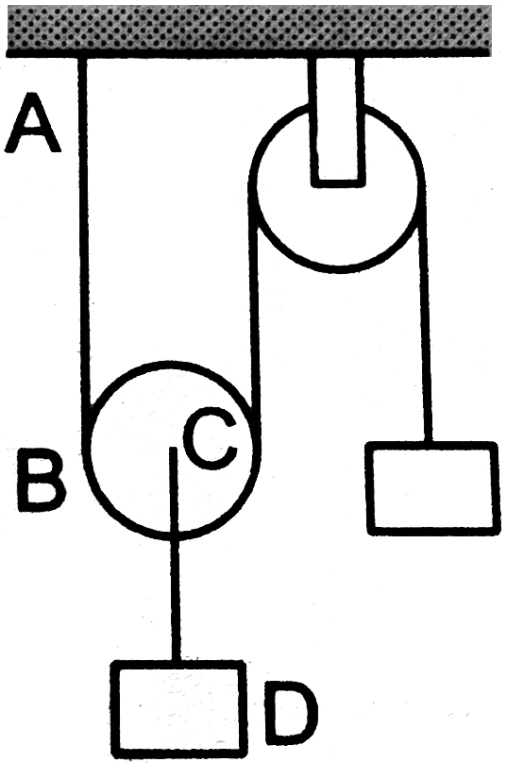
D. $4:1$

Answer: C

Watch Video Solution

15. Both strings shown in figure, are made of same material and have same cross section. The pulleys are light. The wave speed of a

transverse wave in the string AB is v_1 and in CD it isv_2. Then $\frac{v_1}{v_2}$ is



A. 1

B. 2

C. $\sqrt{2}$

D. $\frac{1}{\sqrt{2}}$

Answer: D

Watch Video Solution

16. The motion of a Particle moving along then y- axis is represented as $y = 3(t-2) + 5(t-2)^2$ Identify the correct statement

A. the initial (t =0) velocity of the particle is

$3ms^{-1}$

B. the acceleration of the particle is $5ms^{-1}$

C. the particle is at the origin at t = 2 s

D. all of the above

Answer: C

Watch Video Solution

17. A particle is projected with speed $20ms^{-1}$ at an angle 30° With horizontal. After how much time the angle between velocity and acceleration will be 90°

A. 1 s

B. 2 s

C. 1.5 s

D. never

Answer: A

Watch Video Solution

Watch Video Solution

18. A particle is projected along the line of greatest slope up a rough plane inclined at an angle of 45° with the horizontal. If the coefficient of friction is $1/2$. Their retardation is:

A. $\frac{g}{\sqrt{2}}$

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

C. $\frac{g}{\sqrt{2}}\left(1+\frac{1}{2}\right)$

D. $\frac{g}{\sqrt{2}}\left(1-\frac{1}{2}\right)$

Answer: C

Watch Video Solution

19. A 1.0 kg ball drops vertically into a floor from a height of 25 cm . It rebounds to a height of 4 cm. The coefficient of restitution for the collision is

A. 0.16

B. 0.32

C. 0.4

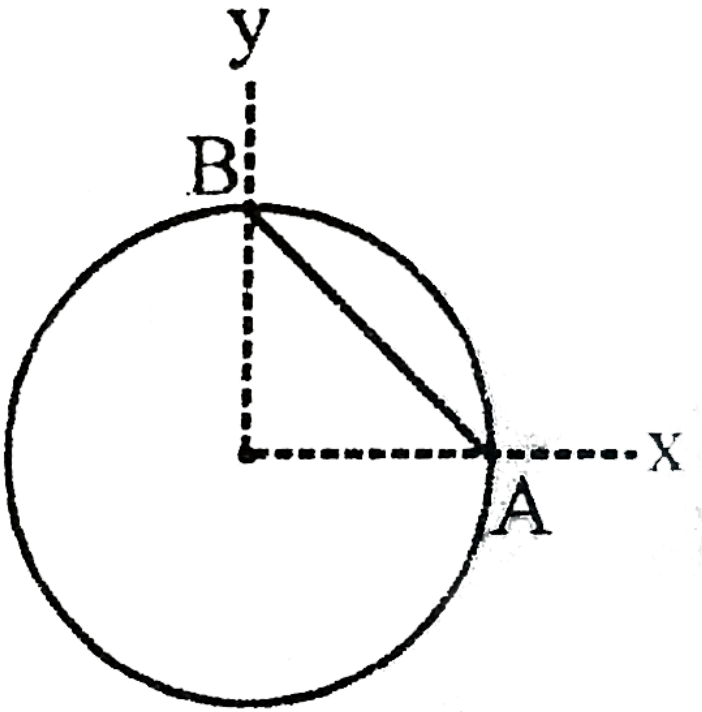
D. 0.56

Answer: C

Watch Video Solution

20. An object comprises of a uniform ring of radius R and its uniform chord AB (not necessarily made of the same material) as shown. Which of the following can not be the

centre of mass of object



A. $\left(\frac{R}{3}, \frac{R}{3}\right)$

B. $\left(\frac{R}{\sqrt{2}}, \frac{R}{\sqrt{2}}\right)$

C. $\left(\frac{R}{4}, \frac{R}{4}\right)$

D. none of these

Answer: B

Watch Video Solution

21. A man of mass 80 kg is riding on a small cart of mass 40 kg which is rolling along a level floor at a speed 2 m/s . He is running on the cart , so that his velocity relative to the cart is 3 m/s in the direction opposite to the

motion of cart . What is the speed of the centre of the mass of the system ?

A. $1.5ms^{-1}$

B. $1ms^{-1}$

C. $3ms^{-1}$

D. zero

Answer: D

Watch Video Solution

22. A ball moving on a horizontal frictionless plane hits an identical ball at rest with a velocity of $0.5m/s$. If the collision is elastic, calculate the speed imparted to the target ball, if the speed of projectile after the collision is $30cm/s$. Show that the two balls will move at right angles to eachother, after the collision.

A. $20cms^{-1}$

B. $30cms^{-1}$

C. $40cms^{-1}$

D. $50cms^{-1}$

Answer: C

Watch Video Solution

23. Keeping the banking angle same , to increase the maximum speed with which a vehicle can traveln on the curve road by 10% , the radius of curvature of the road has to be changed from 20 m to

A. 22 m

B. 40 m

C. 24.2 m

D. 14.4 m

Answer: C

Watch Video Solution

24. If the kinetic energy of a satellite orbiting around the earth is doubled then

A. the satellite will escape into the space.

B. the satellite will fall down on the earth

C. radius of its orbit will be doubled

D. radius of its orbit will become half.

Answer: A

 Watch Video Solution

25. Two satellite A and B , ratio of masses $3:1$ are in circular orbits of radii r and 4 r . Then ratio of total mechanical energy of A to B is

A. $\frac{1}{3}$

B. 3

C. $\frac{3}{4}$

D. 12

Answer: D

Watch Video Solution

26. To study the dissipations of the energy of a simple pendulum, student plots a graph

between square root of time and amplitude .

The graph would be a

A. straight line

B. hyperbola

C. parabola

D. exponential

Answer: B

Watch Video Solution

27. If the same weight is suspended from three springs having length in the ratio $1:3:5$, the period of oscillations shall be the ratio of

A. $1:3:5$

B. $1:\sqrt{3}:\sqrt{5}$

C. $15:5:3$

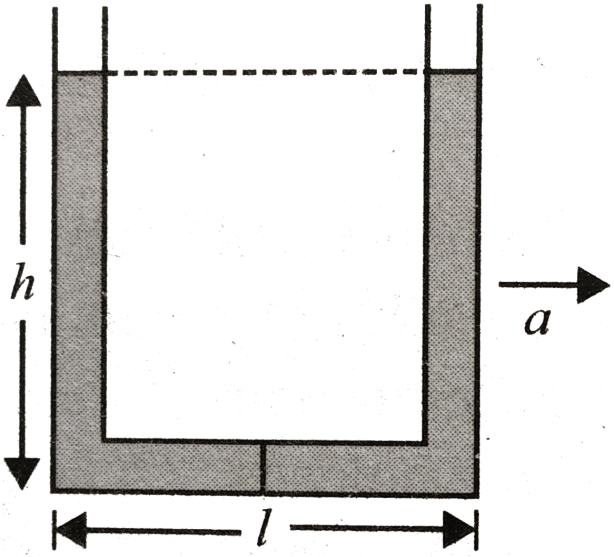
D. $1:\frac{1}{\sqrt{3}}:\frac{1}{\sqrt{15}}$

Answer: B

Watch Video Solution

28. A U-tube of base length l filled with the same volume of two liquids of densities ρ and 2ρ is moving with an acceleration $'a'$ on the horizontal plane. If the height difference between the two surfaces (open to atmosphere) becomes zero, then the height h

is given by



A. $\frac{aL}{2g}$

B. $\frac{3aL}{2g}$

C. $\frac{aL}{g}$

D. $\frac{2aL}{3g}$

Answer: B

Watch Video Solution

29. The work done to get n smaller equal size spherical drops from a bigger size spherical drop of water is proportional to :

A. $\frac{1}{n^{\frac{2}{3}}} - 1$

B. $\frac{1}{n^{\frac{1}{3}}} - 1$

C. $n^{\frac{1}{3}} - 1$

D. $n^{\frac{4}{3}} - 1$

Answer: C

Watch Video Solution

30. The relation between length L and radius R of the cylinder , if its moment of inertia about its axis is equal to that about the equatorial axis, will be

A. $L = R$

B. $L = 2R$

C. $L = 3R$

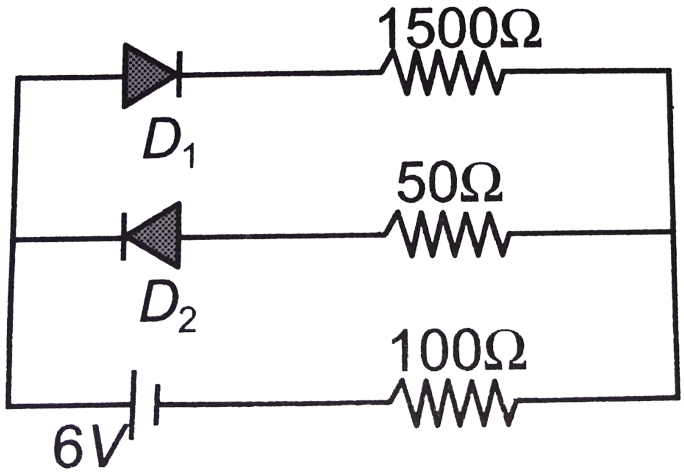
D. $L = \sqrt{3}R$

Answer: D

Watch Video Solution

31. The circuit shown in following figure contanis two diode D_1 and D_2 each with a forward resistance of $50ohm$ and with infinite backward resistance. If the battery voltage is $6V$, the current through the 100 ohm

resistance (in amperes) is



A. Zero

B. 0.02

C. 0.03

D. 0.036

Answer: B

Watch Video Solution

32. A sample of radioactive material decays simultaneouly by two processes A and B with half-lives $\frac{1}{2}$ and $\frac{1}{4}h$, respectively. For the first half hour it decays with the process A, next one hour with the proecess B, and for further half an hour with both A and B. If, origianlly, there were N_0 nuceli, find the number of nuclei after 2 h of such decay.

A. $\frac{N_0}{(2)^8}$

B. $\frac{N_0}{(2)^4}$

C. $\frac{N_0}{(2)^6}$

D. $\frac{N_0}{(2)^5}$

Answer: A

Watch Video Solution

33. Imagine an atom made of a proton and a hypothetical particle of double the mass of the electron but having the same change as the electron. Apply the Bohr atom model and

consider all possible transitions of this hypothetical particle of the first excited level. the longest wavelength photon that will be emitted has wavelength [given in terms of the Rydberg constant R for the hydrogen atom] equal to

A. $\frac{1}{4Z^2R_H}$

B. $\frac{1}{3Z^2R_H}$

C. $\frac{4}{3Z^2R_H}$

D. $\frac{4}{Z^2R_H}$

Answer: B

Watch Video Solution

34. If the magnitude of energy of the electron in nth Bohr orbit is E_n and J_n is its angular momentum , then

A. $E_n \propto J_n^3$

B. $E_n \propto \frac{1}{J_n^{-3}}$

C. $E_n \propto J_n^2$

D. $E_n \propto \frac{1}{J_n^2}$

Answer: D

Watch Video Solution

35. The threshold frequency for a metallic surface corresponds to an energy of $6.2eV$ and the stopping potential for a radiation incident on this surface is $5V$. The incident radiation lies in

A. ultra - violet region

B. infrared region

C. visible region

D. x - ray region

Answer: A

 Watch Video Solution

36. The ratio of the maximum wavelength of the Lyman series in hydrogen spectrum to the maximum wavelength in the Paschen series is

A. $\frac{3}{105}$

B. $\frac{6}{15}$

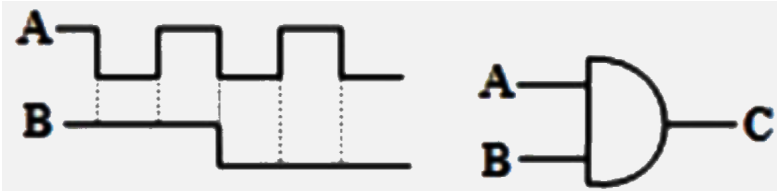
C. $\frac{52}{7}$

D. $\frac{7}{108}$

Answer: D

Watch Video Solution

37. If A & B is figure , then output will be



A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

38. The minimum NOR gates are required to make one NAND gate are

A. 1

B. 2

C. 3

D. 4

Answer: D

 Watch Video Solution

39. In a transistor, the emitter , base and collector are respectively

A. heavily doped , lightly doped , moderately doped

B. heavily doped , moderately doped , lightly doped

C. lightly doped , moderately doped, heavily doped

D. none

Answer: A

Watch Video Solution

40. To get maximum current through a resistance of 2.5Ω, one can use m rows of cells, each row having n cells. The internal resistance of each cell is 0.5Ω what are the values of n and m, if the total number of cells is 45.

A. m = 3 , n = 15

B. m = 5 , n = 9

C. m = 9 , n = 5

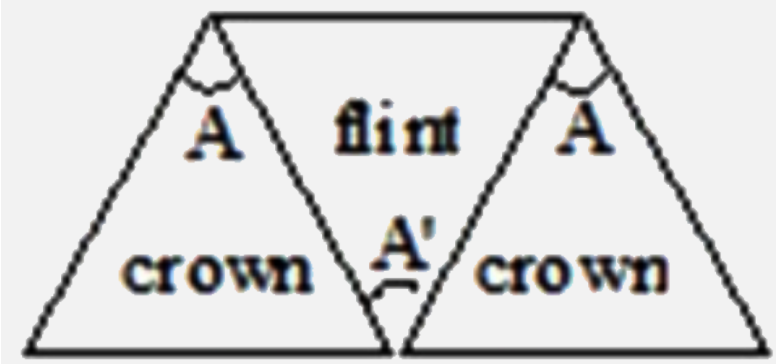
D. m = 15 , n = 3

Answer: A

Watch Video Solution

41. Three thin prisms are combined as shown in figure . The refractive indices of the crown glass for red , yellow and violet rays are μ_r, μ_y and μ_v respectively and those for the flint glass are $\mu_r{}', \mu_y{}'$ and $\mu_v{}'$ respectively . Find the ratio $\frac{A'}{A}$ for which , there is no net angular dispersion (A and A' are respective

deviations)



A. $\frac{\mu_y - 1}{\mu_y - 1}$

B. $\frac{2(\mu_v - \mu_r)}{(\mu'_v - \mu' r)}$

C. $\frac{\mu_v - \mu_r}{\mu'_v - \mu'_r}$

D. $\frac{2(\mu_y - 1)}{(\mu'_y - 1)}$

Answer: B

Watch Video Solution

42. If the refracting angle of a prism is 60° and the minimum deviation is 30°, then the angle of incidence is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: B

Watch Video Solution

43. Consider Fraunhoffer diffraction pattern obtained with a single slit illuminated at normal incidence. At the angular position of the first diffraction minimum the phase difference (in radians) between the wavelets from the opposite edges of the slit is

A. π

B. 2π

C. $\frac{\pi}{4}$

D. $\frac{\pi}{2}$

Answer: B

Watch Video Solution

44. Plane polarised light is passed through a polaroid. On viewing through the polaroid we find that when the polaroid is given one complete rotation about the direction of light

A. the intensity of light gradually decreases to zero and remains at zero

B. the intensity of light gradually increases to a maximum and remains at maximum

C. there is no change in intensity

D. the intensity of light is twice maximum and twice zero

Answer: D

Watch Video Solution