PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 100

Physics

1. A proton and an alpha - particle are accelerated through same potential

difference. Then, the ratio of de-Broglie wavelength of proton and alpha-particle is

A. $2\sqrt{2}:1$

B. $1:2\sqrt{2}$

C. $2:1$

D. $1:2$

Answer: A

Watch Video Solution

2. Two energy levels of an electron in an atom are separated by 2.3 eV. The frequency of radiation emitted when the electrons go from higher to lower level is

A. $6.95 \times 10^{14} Hz$

B. $3.68 \times 10^{15} Hz$

C. $5.6 \times 10^{14} Hz$

D. $9.11 \times 10^{15} Hz$

Answer: C

Watch Video Solution

Watch Video Solution

3. A man stands at one end of a boat which is stationary in water. Neglect water resistance. The man now moves to the other end of the boat and again becomes stationary. The centre of mass of the 'man plus boat' system will remain stationary with respect to water

A. In all cases

B. Only when tha man is stationary initially and finally

C. Only if the man moves without accelection on the boat

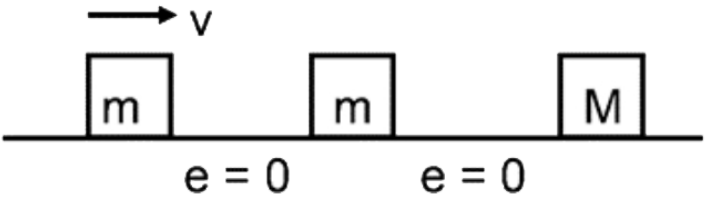
D. Only if the man and the boat have equal masses.

Answer: A

Watch Video Solution

4. Three blocks of masses m , m and M are kept on a frictionless floor as shown in the figure .The leftmost block is given velocity v towards

the right . All the collision between the blocks are perfectly inelastic . The loss in kinetic energy after all the collision is $5/6th$ of initial kinetic energy. The ratio of M/m will be



A. $\frac{1}{4}$

B. $\frac{1}{8}$

C. 2

D. 4

Answer: D

Watch Video Solution

5. An aircraft executes a horizontal loop of radius 1 km with a steady speed of $900kmh^{-1}$. Compare its centripetal acceleration with the acceleration due to gravity.

A. 3.2

B. 6.4

C. 1.8

D. 7.9

Answer: B

Watch Video Solution

6. A paramagnetic substance of susceptibility 3×10^{-4} is placed in a magnetic field of $3 \times 10^{-4} Am^{-1}$. . Then , the intensity of magnetisation in units of A m^{-1} is

A. 9×10^{-8}

B. 1×10^{-4}

C. 1×10^{-3}

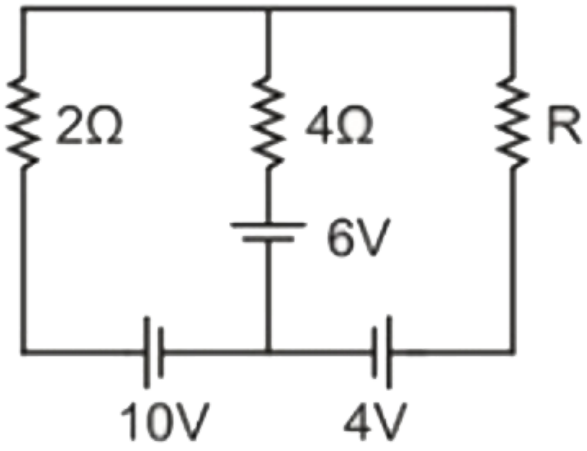
D. 9×10^{-10}

Answer: A

Watch Video Solution

7. For what value of R in the circuit as shown current passing through 4Ω resistance will be

zero



A. 1Ω

B. 2Ω

C. 3Ω

D. 4Ω

Answer: A

Watch Video Solution

8. When two resistances R_1 and R_2 are connected in series , they consume 12 W powers . When they are connected in parallel , they consume 50 W powers . What is the ratio of the powers of R_1 and R_2 ?

A. $\frac{1}{4}$

B. 4

C. $\frac{3}{2}$

D. 3

Answer: C

Watch Video Solution

9. Two ball with charges $5\mu C$ and $10\mu C$ are at a distance of 1 m from each other. In order to reduce the distance between them to 0.5 m , the amount of work to be performed is

A. 45 J

B. $0.45 \times 10^{-6} J$

C. $1.2 \times 10^{-4} J$

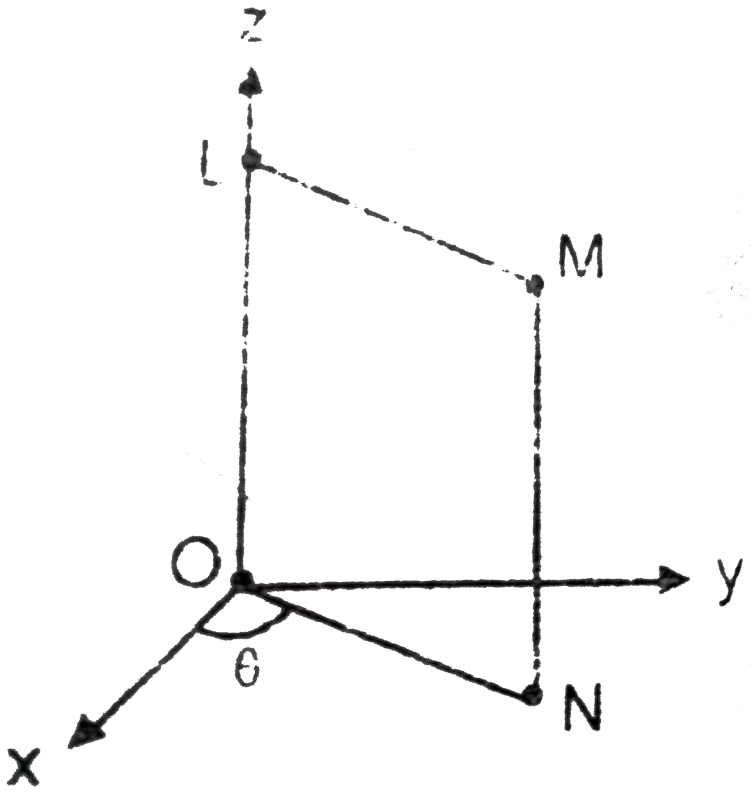
D. 0.45 J

Answer: D

Watch Video Solution

10. The electric field intensity at all points in space is given by $\overrightarrow{E} = \sqrt{3}\hat{i} - \hat{j}$ volts/metre. A square frame LMNO of side 1 metre is shown in figure. The point N lies in x-y plane. The

initial angle between line ON and x-axis is $\theta = 60^\circ$



The magnitude of electric flux through area enclosed in square frame LMNO is -

A. 0 V m

B. 1 V m

C. 2 V m

D. 4 V m

Answer: C

Watch Video Solution

11. Two identical wires A and B have the same length l and carry the same current I. Wire A is bent into a circle of radius R and wire B is bent to form a square of side a. If B_1 and B_2 are

the values of magnetic induction at the centre of the circle and the centre of the square, respectively, then the ratio B_1 / B_2 is

A. $\left(\frac{\pi^2}{8}\right)$

B. $\left(\frac{\pi^2}{8\sqrt{2}}\right)$

C. $\left(\frac{\pi^2}{16}\right)$

D. $\left(\frac{\pi^2}{16\sqrt{2}}\right)$

Answer: B

Watch Video Solution

12. In a series LCR circuit resistance $R = 10\Omega$ and the impedance $Z = 10\Omega$ The phase difference between the current and the voltage is

A. 0°

B. 30°

C. 45°

D. 60°

Answer: A

Watch Video Solution

13. A satellite moves round the earth in a circular orbit of radius R making one revolution per day. A second satellite moving in a circular orbit, moves round the earth once in 8 days. The radius of the orbit of the second satellite is

A. 8 R

B. 4 R

C. 2 R

D. R

Answer: B

Watch Video Solution

14. Two sphere of masses m and M are situated in air and the gravitational force between them is F. The space around the masses in now filled with a liquid of specific gravity 3. The gravitational force will now be

A. 3F

B. F

C. F/3

D. F/9

Answer: B

 Watch Video Solution

15. Two solid spheres of radii R_1 and R_2 are made of the same material and have similar surfaces. These are raised to the same temperature and then allowed to cool under

identical conditions. The ratio of their initial rates of loss of heat are

A. $\frac{R_1}{R_2}$

B. $\frac{R_2}{R_1}$

C. $\frac{R_1^2}{R_2^2}$

D. $\frac{R_2^2}{R_1^2}$

Answer: C

Watch Video Solution

16. An ideal gas is found to obey and additional law VP^2 = constant. The gas is initially at temperature T and volume V . When it expands to a volume 2 V , the temperature becomes

A. $\sqrt{2}T$

B. 2T

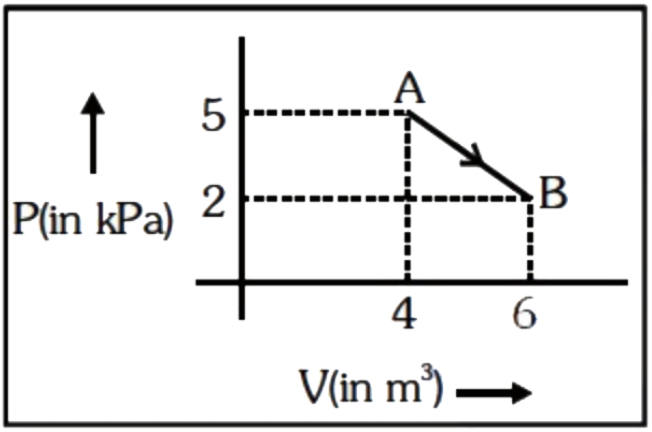
C. $2\sqrt{2}T$

D. 4T

Answer: A

Watch Video Solution

17. One mole of an ideal diatomic gas undergoes a transition from A to B along a path AB as shown in the figure,



The change in internal energy of the gas during the transition is :

A. 20 kJ

B. $-20kJ$

C. 20 J

D. $-20kJ$

Answer: B

Watch Video Solution

18. A long wire carries a steady current . It is bent into a circle of one turn and the magnetic field at the centre of the coil is B. It

is then bent into a circular loop of n turns. The magnetic field at the centre of the coil will be

A. nB

B. n^2B

C. $3nB$

D. n^3B

Answer: B

Watch Video Solution

19. A long solenoid with 40 turns per cm carries a current of 1 A. The magnetic energy stored per unit volume is..... J m^{-3}.

A. 3.2π

B. 32π

C. 1.6π

D. 6.4π

Answer: A

Watch Video Solution

20. A particle starts its motion from rest under the action of a constant force. If the distance covered in first $10s$ is s_1 and the covered in the first $20s$ is s_2, then.

A. $S_2 = 3S_1$

B. $S_2 = 4S_1$

C. $S_2 = 4S_1$

D. $S_2 = 2S_1$

Answer: B

 Watch Video Solution

21. A body is projected with a initial velocity of $\left(8\hat{i}+6\hat{j}\right)ms^{-1}$. The horizontal range is $\left(g=10ms^{-2}\right)$

A. 9.6 m

B. 14 m

C. 50 m

D. 100 m

Answer: A

Watch Video Solution

22. Consider a car moving along a straight horizontal road with a speed of 72 km/h. If the coefficient of static friction between the tyres and the road is 0.5, the shortest distance in which the car can be stopped is $[g = 10ms^{-1}]$

A. 30 m

B. 40 m

C. 72 m

D. 20 m

Answer: B

Watch Video Solution

23. A spring balance is attached to the ceiling of a lift. A man hangs his bag on the spring and the spring reads 49N, when the lift is stationary. If the lift moves downward with an acceleration of $5m/2^2$, the reading of the spring balance will be

A. 49 N

B. 24 N

C. 74 N

D. 15 N

Answer: B

 Watch Video Solution

24. The binding energy per nucleon of deuterium and helium nuclei are 1.1 MeV and 7.0 MeV respectively. When two deuterium

nuclei fuse to form a helium nucleus the energy released in the fusion is

A. 23.6 MeV

B. 2.2 MeV

C. 28.0 MeV

D. 30.2 MeV

Answer: A

 Watch Video Solution

25. Which of the following statement is true for ${}_{6}^{14}C, {}_{7}^{15}N$ and ${}_{8}^{16}O$

A. They have equal number of protons

B. The have equal number of electrons

C. They have equal number of neutrons

D. They have equal mass number

Answer: C

Watch Video Solution

26. The displacement x (in metre) of a particle in, simple harmonic motion is related to time t (in second) as

$$x = 0.01 \cos\left(\pi t + \frac{\pi}{4}\right)$$

the frequency of the motion will be

A. 0.5Hz

B. 1.0 Hz

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

D. πHz

Answer: A

Watch Video Solution

27. A simple pendulum 4 m long swings with an amplitude of 0.2 m. What is its acceleration at the ends of its path? (g = $10 m / s^2$)

A. zero

B. $10 \ \mathrm{m\,s^{-2}}$

C. $0.5 \ \mathrm{m\,s^{-2}}$

D. $2.5 \ \mathrm{m\,s^{-2}}$

Answer: C

Watch Video Solution

28. Electron are accelerated through a potential difference V and protons are accelerated through a potential difference of 4 V. The de-Broglie wavelength are λ_e and λ_p for electrons and protons, respectively The ratio of $\frac{\lambda_e}{\lambda_p}$ is given by (given , m_e is mass of electron and m_p is mass of proton)

A. $\frac{\lambda_e}{\lambda_p} = \sqrt{\frac{m_p}{m_e}}$

B. $\frac{\lambda_e}{\lambda_p} = \sqrt{\frac{m_e}{m_p}}$

C. $\frac{\lambda_e}{\lambda_p} = \frac{1}{2}\sqrt{\frac{m_e}{m_p}}$

D. $\frac{\lambda_e}{\lambda_p} = 2\sqrt{\frac{m_p}{m_e}}$

Answer: D

Watch Video Solution

29. A metal surface is illuminated by a light of given intensity and frequency to cause photoemission. If the intensity of illumination is reduced to one-fourth of its original value,

then the maximum KE of emitted photoelectrons will become.

A. Four times the original value

B. Twice the original value

C. $1/6^{th}$ of the original value

D. Unchanged

Answer: D

Watch Video Solution

30. Two tubes A and B are in series. The radius of A is R and that of B is 2R. If water flows through A with velocity v then the velocity of water through B is

A. $\frac{v}{2}$

B. v

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

D. $\frac{v}{8}$

Answer: C

Watch Video Solution

Watch Video Solution

31. A water pump, rated $400W$, has an efficiency of $75\,\%$. If it is employed to raise water through a height of $40m$, find the volume of water drawn in $10\ \min$.

A. $0.45m^3$

B. $0.75m^3$

C. $0.62m^3$

D. $0.02m^3$

Answer: A

Watch Video Solution

32. A ray of light suffers a minimum deviation when incident on equilateral prism of refractive index $\sqrt{2}$ The angle of deviation is

A. 30°

B. 45°

C. 60°

D. 50°

Answer: A

Watch Video Solution

33. An astronomical telescope has large apeture to

A. reduce spherical aberration

B. have high resolution

C. increase span of observation

D. have low dispersion

Answer: B

Watch Video Solution

34. A solid cylinder rolls down from an inclined plane of height h. What is the velocity of the cylinder when it reaches at the bottom of the plane ?

A. $\sqrt{\frac{2gh}{3}}$

B. $\sqrt{2gh}$

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

D. $\sqrt{\frac{3gh}{2}}$

Answer: C

Watch Video Solution

35. The diameter of a flywheel is increased by 1% . Increase in its moment of interia about the central axis is

A. 1%

B. 0.5%

C. 2%

D. 4%

Answer: C

Watch Video Solution

36. A charge of 8.0 mA in the emitter current brings a charge of 7.9 mA in the collector current. The values of α and β are

A. 0.99,90

B. 0.96,79

C. 0.97, 99

D. 0.99 , 79

Answer: D

 Watch Video Solution

37. A common emitter amplifier has a voltage gain of 50, an input impedance of 100Ω and an output impedance of 200 Ω. The power gain of the amplifier is :-

A. 500

B. 1000

C. 1250

D. 100

Answer: C

Watch Video Solution

38. Pressure of an ideal gas is increased by keeping temperature constant.What is its effect on kinetic energy of molecules?

A. Decrease

B. Increase

C. Remains same

D. Increases or decreases depending on the nature of gas

Answer: B

Watch Video Solution

39. Unit of Stefan's constant is

A. $\mathrm{W\ m^{-2}K^{-1}}$

B. $\mathrm{W\ m^{2}K^{-4}}$

C. $\mathrm{W\ m^{-2}K^{-4}}$

D. $\mathrm{W\ m^{-2}K^{4}}$

Answer: C

Watch Video Solution

40. Two point white dots are 1mm apart on a black paper. They are viewed by eye of pupil diameter 3mm. Approximately, what is the

maximum distance at which these dits can be resolved by the eye? [Take wavelelngth of light =500nm]

A. 6 m

B. 3 m

C. 1 m

D. 5 m

Answer: D

Watch Video Solution

41. In Young's double-slit experiment, the intensity of light at a point on the screen where the path difference is λ is I, λ being the wavelength of light used. The intensity at a point where the path difference is $\lambda/4$ will be

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

B. $\frac{I}{2}$

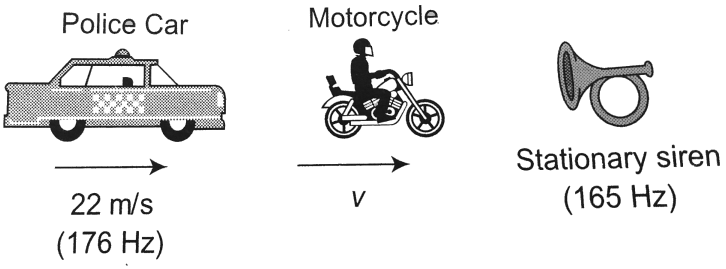
C. I

D. Zero

Answer: B

Watch Video Solution

42.



A police car moving at $22m/s$, chases a motorcyclist, the police man sounds his horn at $176Hz$, while both of them move towards a stationary siren of frequency $165Hz$. Calculate

the speed of the motorcycle, if it is given that he does not observes any beat

A. $33ms^{-1}$

B. $22ms^{-1}$

C. Zero

D. $11ms^{-1}$

Answer: B

 Watch Video Solution

43. Fundamental frequency of a sonometer wire is n. If

the length and diameter of the wire are doubled

keeping the tension same, then the new fundamental

frequency is

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

B. $\sqrt{2n}$

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

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

Answer: C

Watch Video Solution

44. For an ideal gas , the specific heat at constant pressure C_p is greater than the specific heat at constant volume C_v This is because

A. There is a finite done by the gas on its environment when its temperature is increased while pressure remains constant

B. There is a finite done by the gas on its environment when its temperature is increased while the volume remains constant

C. The pressure of the gas remains constant when its temperature remains

constant

D. The internal energy of the gas at constant pressure is more than at constant volume

Answer: A

 Watch Video Solution

45. The work-energy theorem states that the change in

A. Kinetic energy of a particle is equal to the work done on it by the net force

B. Kinetic energy of a particle is equal to the work done by one of the force acting to it

C. Potential energy of particle is equal to the work done on it by the net force

D. Total energy of particle is equal to the work done on it by the net force

Answer: A

Watch Video Solution