PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 113

Physics

1. In Bohr's model of the hydrogen atom, which of the following pairs of quantities are quantized?

A. Energy and linear momentum

B. Linear and angular momentum

C. Energy and angular momentum

D. None of the above

Answer: C

Watch Video Solution

2. The wavelength of light emitted from second orbit to first orbits in a hydrogen atom is

A. 6563Å

B. 4102Å

C. 4861Å

D. 1215Å

Answer: D

Watch Video Solution

3. A thin circular ring of mass m and radius R is rotating about its axis perpendicular to the plane of the ring with a constant angular

velocity ω. Two point particleseach of mass M are attached gently to the opposite end of a diameter of the ring. The ring now rotates, with an angular velocity $\frac{\omega}{2}$. Then the ratio $\frac{m}{M}$ is

A. 1

B. 2

C. $\frac{1}{2}$

D. $\sqrt{2}$

Answer: B

Watch Video Solution

4. Four identical spheres each of radius 10 cm and mass 1 kg are placed on a horizontal surface touching one another so that their centres are located at the corners of square of side 20 cm. What is the distance of their centre of mass from centre of either sphere ?

A. 5 cm

B. 10 cm

C. 20 cm

D. $10\sqrt{2}cm$

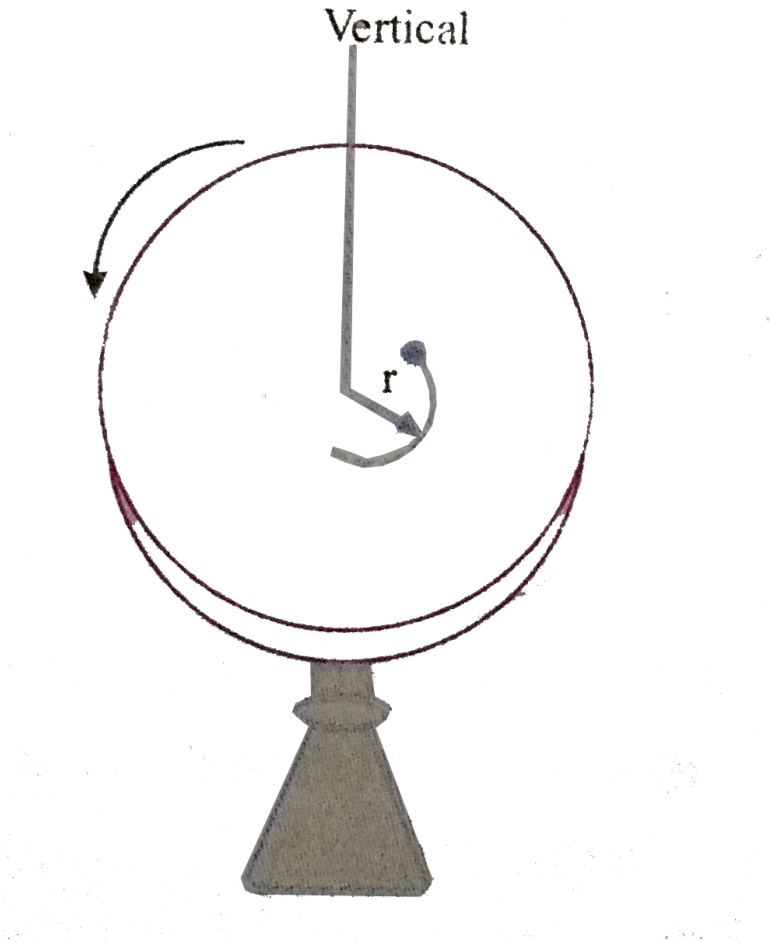
Answer: D

Watch Video Solution

5. A small coin of mass $80g$ is placed on the horizontal surface of a rotating disc. The disc starts from rest and is given a constant angular acceleration $\alpha = 2rad/s^2$. The coefficient of static friction between the coin and the disc is $\mu_s = 3/4$ and cofficient of

kinetic friction is $\mu_k = 0.5$. The coin is placed at a distance $r = 1m$ from the centre of the disc. The magnitude of the resultant force on the coin exerted by the disc just before it

starts slipping on the disc is



A. 0.2 N

B. 0.3 N

C. 0.4 N

D. 0.5 N

Answer: D

Watch Video Solution

6. A short bar magnet of moment $0 \cdot 32JT^{-1}$ is placed in a uniform external magnetic field of $0 \cdot 15T$, if the bar is free to rotate in the plane of the field, which orientations would correspond to its, (i) stable and (ii) unstable

equilibrium? What is the potential energy of the magnet in each case?

A. $4.8 \times 10^{-2} J$

B. $9.6 \times 10^{-2} J$

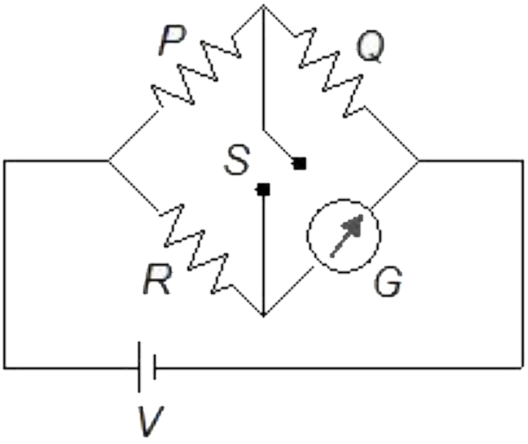
C. $2.4 \times 10^{-2} J$

D. $1.2 \times 10^{-2} J$

Answer: A

Watch Video Solution

7. In the circuit shown as $P \neq R$ and the reading of the galvanometer G is same with the switch open or closer. Then



A. $I_R = I_G$

B. $I_P = I_G$

C. $I_Q = I_G$

D. $I_Q = I_R$

Answer: A

Watch Video Solution

8. The ratio of voltage sensitivity (V_S) and current sensitivity (I_S) of a moving coil galvanometer is

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

B. $\frac{1}{G^2}$

C. G

D. G^2

Answer: A

Watch Video Solution

9. A wire of length l is formed into a circular loop of one turn only and is suspended in a magnetic field B. When a current i is passed through the loop, the maximum torque experienced by it is

A. $\left(\frac{1}{4\pi}\right) BIl^2$

B. $\left(\frac{1}{4\pi}\right) BI^2 l$

C. $\left(\frac{1}{4\pi}\right) BIl$

D. $\left(\frac{1}{4\pi}\right) B^2 Il$

Answer: A

Watch Video Solution

10. In series LCR circuit $R = 18\Omega$ and impedence is 33Ω. An Vrms voltage $220V$ is

applied across the circuit . The true power consumed in AC circuit is

A. 220 W

B. 400 W

C. 600 W

D. 800 W

Answer: D

 Watch Video Solution

11. A parallel plate air capacitor has a capacitance C. When it is half filled with a dielectric of dielectric constant 5, the percentage increase in the capacitance will be

A. 4

B. $66.6\ \%$

C. $33.3\ \%$

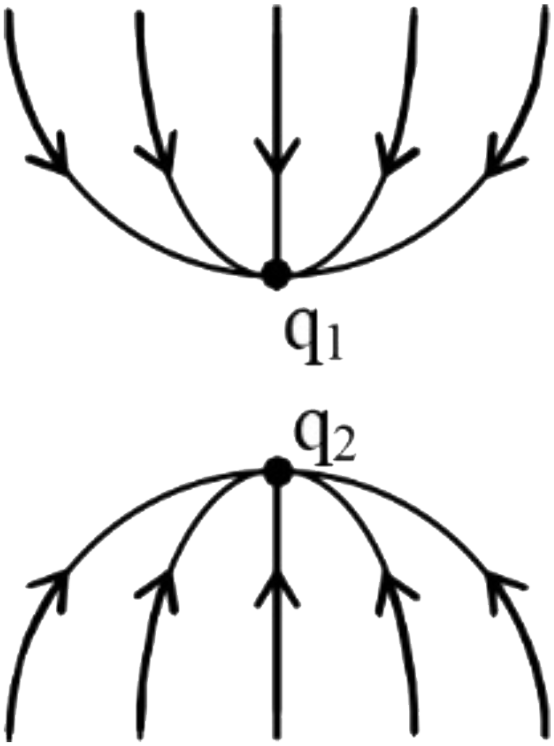
D. $200\ \%$

Answer: B

Watch Video Solution

Watch Video Solution

12. In the adjoining figure, the electric field lines for charges q_1 and q_2 are shown. Identify the sign of the charges.



A. both negative

B. upper charge is negatively and lower is positive

C. both positive

D. upper charge is positive and lower is negative

Answer: A

Watch Video Solution

13. When a body is taken from the equator to the poles, its weight

A. Remains same

B. Increases

C. decreases

D. Increase at N-pole & decreases at S-pole

Answer: B

Watch Video Solution

14. Two particles of masses 'm' and '9m' are separated by a distance 'r'. At a point on the line joining them the gravitational field is zero. The gravitational potential at that point is (G = Universal constant of gravitation)

A. $-\frac{4Gm}{r}$

B. $-\frac{8Gm}{r}$

C. $-\frac{16Gm}{r}$

D. $-\frac{32Gm}{r}$

Answer: C

Watch Video Solution

15. A body takes T minutes to cool from $62^\circ C$ to $61^\circ C$ when the surrounding temperature is $30^\circ C$. The time taken by the body to cool from $46^\circ C$ to $45.5^\circ C$ is

A. Greater than T minutes

B. Equal to T minutes

C. Less than T minutes

D. None of these

Answer: B

Watch Video Solution

16. In a Carnot engine when $T_2 = 0^\circ C$ and $T_1 = 200^\circ C$ its efficiency is η_1 and when $T_1 = 0^\circ C$ and $T_2 = -200^\circ C$. Its efficiency is η_2, then what is η_1 / η_2?

A. 0.577

B. 0.733

C. 0.638

D. Cannot be calculated

Answer: A

Watch Video Solution

17. A fixed mass of a gas is first heated isobarically to double the volume and then cooled isochorically to decrease the temperature back to the initial value. By what factor would the work done by the decreased, had the process been isothermal?

A. 2

B. $\frac{1}{2}$

C. ln 2

D. ln 3

Answer: C

Watch Video Solution

18. A current- carrying straight wire is kept along the axis of a circular loop carrying a current. The straight wire

A. Will exert an inward force on the circular loop

B. Will exert an outward force on the circular loop

C. Will exert a force on a circular loop parallel to itself

D. Will not exert any force on the circular loop

Answer: D

Watch Video Solution

19. The force between two parallel current carrying wires is independent of

A. their distance of separation

B. the length of the wire

C. the magnitude of currents

D. the radii of the wire

Answer: D

Watch Video Solution

20. A ball A is thrown up vertically with a speed u and at the same instant another ball B is released from a height h. At time t, the speed A relative to B is

A. u

B. $u - 2gt$

C. $\sqrt{u^2 - 2gh}$

D. $u - gt$

Answer: B

Watch Video Solution

21. The maximum height attained by a projectile when thrown at an angle θ with the horizontal is found to be half the horizontal range. Then θ is equal to

A. $\tan^{-1}(2)$

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

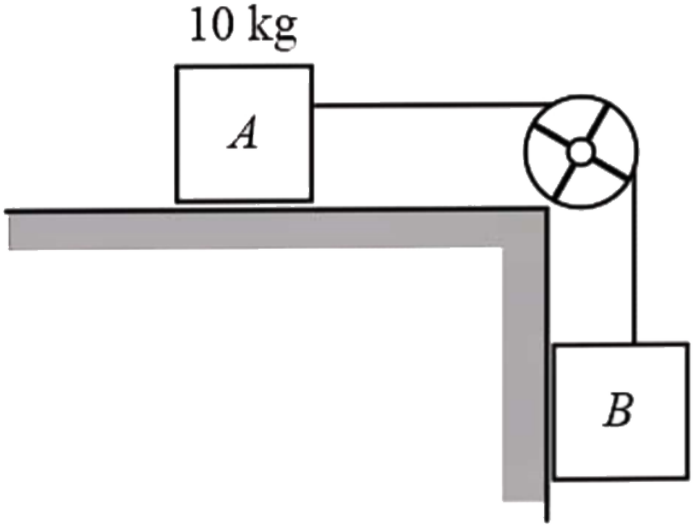
C. $\frac{\pi}{4}$

D. $\tan^{-1}\left(\frac{1}{2}\right)$

Answer: A

Watch Video Solution

22. If the mass of A=10 kg, coefficient of static friction=0.22, coefficient of kinetic friction=0.2, then minimum mass of B to start motion is



A. 2kg

B. 2.2kg

C. 4.8kg

D. 3.4kg

Answer: B

 Watch Video Solution

23. A block moves down a smooth inclined plane of inclination θ. Its velocity on reaching the bottom is v. If it slides down a rough

inclined plane of some inclination, its velocity on reaching the bottom is v/n, where n is a number greater than 0. The coefficient of friction is given by -

A. $\mu = \tan\theta\left(1 - \frac{1}{n^2}\right)$

B. $\mu = \cot\theta\left(1 - \frac{1}{n^2}\right)$

C. $\mu = \tan\theta\left(1 - \frac{1}{n^2}\right)^{1/2}$

D. $\mu = \cot\theta\left(1 - \frac{1}{n^2}\right)^{1/2}$

Answer: A

Watch Video Solution

24. For pair production i.e. for the production of electron and positron, the incident photon must have a minimum frequency of the order of

A. $10^{18} s^{-1}$

B. $10^{21} s^{-1}$

C. $10^{25} s^{-1}$

D. $10^{30} s^{-1}$

Answer: B

Watch Video Solution

25. which a U^{238} nucleus original at rest , decay by emitting an alpha particle having a speed u , the recoil speed of the residual nucleus is

A. $\frac{2u}{238}$

B. $\frac{3u}{234}$

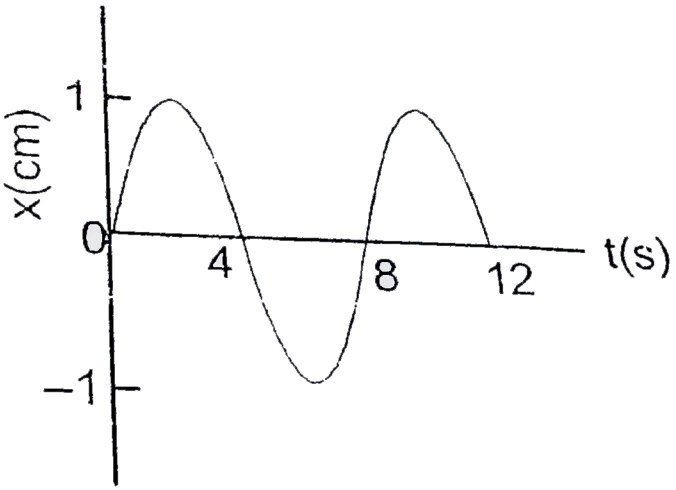
C. $\frac{4u}{234}$

D. $\frac{5u}{238}$

Answer: C

Watch Video Solution

26. The $x - t$ graph of a particle undergoing simple harmonic motion is shown below. The acceleration of the particle at $t = 4/3s$ is



A. $\frac{\sqrt{3}}{32}\pi^2 cms^{-2}$

B. $-\frac{\pi^2}{32}cms^{-2}$

C. $\frac{\pi^2}{32}cms^{-2}$

D. $-\frac{\sqrt{3}}{32}\pi^2 cms^{-2}$

Answer: D

Watch Video Solution

27. Two springs are joined and attached to a mass of 16 kg. The system is then suspended vertically from a rigid support. The spring

constant of the two spring are k_1 and k_2 respectively. The period of vertical oscillations of the system will be

A. $8\pi\sqrt{\frac{k_1+k_2}{k_1k_2}}$

B. $\frac{\pi}{2}\sqrt{\frac{k_1}{k_2}}$

C. $\sqrt{\frac{k_1+k_2}{8\pi}}$

D. $\pi\sqrt{\frac{k_1-k_2}{2}}$

Answer: A

Watch Video Solution

28. A particle is dropped from a height H. The de Broglie wavelength of the particle as a function of height is proportional to

A. $H^{-1/2}$

B. H^{0}

C. $H^{1/2}$

D. H

Answer: A

Watch Video Solution

29. The wavelength of de-Broglie wave associated with a thermal neutron of mass m at absolute temperature T is given by (here, k is the Boltzmann constant)

A. $\frac{h}{\sqrt{2mkT}}$

B. $\frac{h}{\sqrt{mkT}}$

C. $\frac{h}{\sqrt{3mkT}}$

D. $\frac{h}{2\sqrt{mkT}}$

Answer: C

Watch Video Solution

30. Bernoulli's theorem is a consequence of the law of conservation of

A. Angular momentum

B. Mass

C. Energy

D. Momentum

Answer: C

 Watch Video Solution

31. A metal rod of length 'L' and cross-sectional area 'A' is heated through $'T'^{\circ} C$ What is the force required to prevent the expansion of the rod lengthwise ?

A. $\frac{YA\alpha T}{(1-\alpha T)}$

B. $\frac{YA\alpha T}{(1+\alpha T)}$

C. $\frac{(1-\alpha T)}{YA\alpha T}$

D. $\frac{(1+\alpha T)}{YA\alpha T}$

Answer: B

Watch Video Solution

32. Two plano-convex lenses of focal lengths 20cm and 30cm are placed together to form a double convex lens. The final focal length will be

A. 12 cm

B. 60 cm

C. 20 cm

D. 30 cm

Answer: A

 Watch Video Solution

33. A linear object of heigth 10 cm is kept in front of concave mirror of radius of curvature 15 cm, at distance of 10 cm. The image formed is

A. Magnified are erect

B. Magnified and inverted

C. Diminished are erect

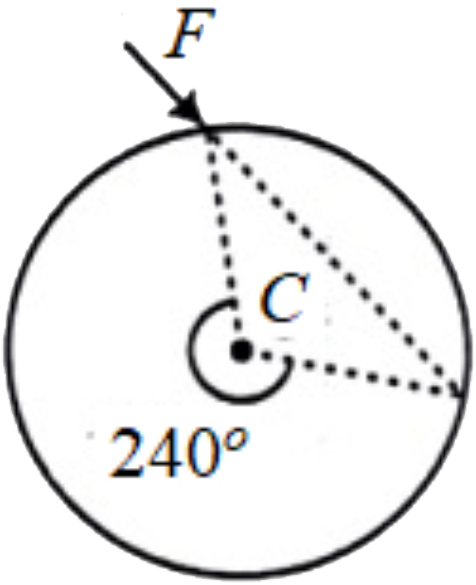
D. Diminished and inverted

Answer: B

Watch Video Solution

34. A uniform disc of mass M and radius R is hinged at its centre C. A force F is applied on the disc as shown. At this instant, the angular

acceleration of the disc is



A. $\sqrt{3}\frac{F}{MR}$

B. $\frac{F}{MR}$

C. $\frac{2}{\sqrt{3}}\frac{F}{MR}$

D. $\frac{F}{2MR}$

Answer: B

Watch Video Solution

35. A solid cylinder is rolling without slipping down an inclined plane. Then its angular momentum is :

A. Conserved about COM of the cylinder

B. Conserved about point of contact

C. Conserved about all the points

D. Not conserved about any point

Answer: D

 Watch Video Solution

36. The energy gap in case of which of the following is maximum?

A. Germanium

B. Iron

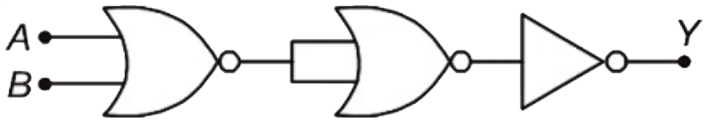
C. Copper

D. Aluminium

Answer: A

Watch Video Solution

37. The given electrical network is equivalent to



A. AND gate

B. OR gate

C. NOR gate

D. NOT gate

Answer: C

Watch Video Solution

38. A copper rod of length l_0 at 0°C is placed on smooth surface. Now, the rod is heated upto 100°C. Find the longitudinal strain developed.

(α=coefficient of linear expansion)

A. $\frac{100-\alpha}{l_0+100l_0\alpha}$

B. 100α

C. Zero

D. None of these

Answer: C

Watch Video Solution

39. If force, length and time are taken as fundamental units, then the dimensions of mass will be

A. $\left[FLT^{-2}\right]$

B. $\left[FL^{-2}T^{-1}\right]$

C. $\left[FL^{-1}T^{2}\right]$

D. $\left[F^{2}LT^{-2}\right]$

Answer: C

Watch Video Solution

40. Two identical light waves having phase difference $'\phi'$ propagate in same direction.

When they superpose, the intensity of resultant wave is proportional to

A. $\cos^2\phi$

B. $\frac{\cos^2(\phi)}{2}$

C. $\frac{\cos^2(\phi)}{3}$

D. $\frac{\cos^2(\phi)}{4}$

Answer: B

Watch Video Solution

41. The fringes produce in diffraction pattern are of

A. Are of equal width

B. Are of unequal width

C. Having equal intersity for bright frings

D. None of these

Answer: B

Watch Video Solution

42. A string has a length of 5 cm between fixed points and has a fundamental frequency of 20 Hz. What is the frequency of the second overtone?

A. 40 Hz

B. 50 Hz

C. 60 Hz

D. 30 Hz

Answer: C

Watch Video Solution

43. The equation of a sound wave is $y = 0.0015 \sin(62.4x + 316t)$ the wavelength of this wave is

A. 0.2 unit

B. 0.1 unit

C. 0.3 unit

D. 0.4 unit

Answer: B

 Watch Video Solution

44. Two men with weights in the ratio 4:3 run up a staircase in time in the ratio 12:11. The ratio of power of the first to that of second is

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

B. $\frac{12}{11}$

C. $\frac{48}{33}$

D. $\frac{11}{9}$

Answer: D

Watch Video Solution

45. A force $F = 2\hat{i} + 4\hat{j}$ Newton displaces the body by $s = 3\hat{j} + 5\hat{k}$ meter in 2s. The power generated will be

A. 11 W

B. 6 W

C. 22 W

D. 12 W

Answer: B

Watch Video Solution