PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 108

Physics

---

1. The total energy of an electron in the first excited state of the hydrogen atom is about -3.4 eV.

What is the potential energy of the electron in this state ?

A. $-6.8eV$

B. $-8.6eV$

C. $6.8eV$

D. $8.6eV$

Answer: A

2. The spectrum of an oil flame is an example for

A. Line emission spectrum

B. Continuous emission spectrum

C. Line absroption spectrum

D. Band emission spectrum

Answer: B

▶ Watch Video Solution

3. Two homogeneous spheres A and B of masses m and 2m having radii 2a and a respectively are placed in touch . The distance of the centre of mass from the first sphere is

A. a

B. $2a$

C. $3a$

D. None of these

Answer: B

▶ Watch Video Solution

4. 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. $-4v/234$

B. $-4v/238$

C. $4v/238$

D. $-v/4$

Answer: A

▶ Watch Video Solution

5. What is the angle between velocity vector and acceleration vector in unitorm circular motion ?

A. $180°$

B. $90°$

C. $45°$

D. $60°$

Answer: B

6. At magnetic poles of earth, angle of dip is

A. $45°$

B. $30°$

C. zero

D. $90°$

Answer: D

▶ Watch Video Solution

7. A Daniel cell is balanced on $125cm$ length of a potentiometer wire. Now the cells is short-circuited by a resistance $2ohm$ and the balance is obtained at $100cm$. The internal resistance of the Dainel cell is

A. $\dfrac{4}{3}\Omega$

B. 1.5Ω
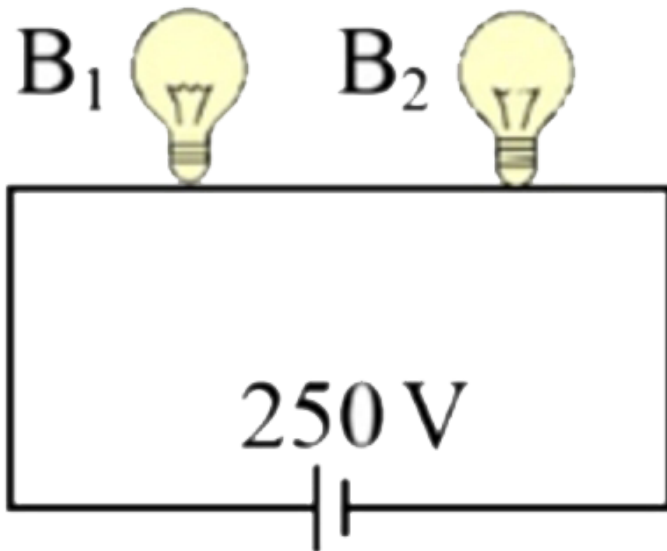
C. 1.25Ω

D. 0.5Ω

Answer: D

8. Bulb $B_1(100W - 250W)$ and bulb $B_2(100W - 200V)$ are connected across 250V. What is potential drop across B_2 ?

A. $200V$

B. $250V$

C. $98V$

D. $48V$

Answer: C

▶ **Watch Video Solution**

---

9. Three identical charges are placed on three

vertices of a square. If the force acting

between q_1 and q_2 is F_{12} and between

q_1 and q_3 is F_{13} then $\dfrac{F_{13}}{F_{12}} = $ _____.

A. $\dfrac{1}{2}$

B. 2

C. $\dfrac{1}{\sqrt{2}}$

D. $\sqrt{2}$

Answer: A

▶ **Watch Video Solution**

10. Nature of equipotential surface for a point

charge is

A. ellopsoid with charge at foci

B. sphere with charge at the centre of the

sphere

C. sphere with charge on the surface of the

sphere

D. plane with charge on the surface

Answer: B

11. In LCR series AC circuit, the current

A. The reactance

B. The resistance

C. Zero

D. Twice the reactance

Answer: B

▶ Watch Video Solution

12. At time t = 0 second, voltage of an A.C. Generator starts from 0V and becomes 2V at time $t = \dfrac{1}{100\pi}$ second. The voltage keeps on increasing up 100 V, after wihich it starts to decrease. Find the frequency of the Generator.

A. 100 Hz

B. 1 Hz

C. 2 Hz

D. 5 Hz

Answer: B

13. Gravitational force acts on a particle due to fixed uniform solid sphere. Neglect other forces. Then particle

    A. always moves normal to the radial direction.

    B. always moves in the radial direction only.

    C. always moves in circular orbit.

D. experiences a force directed along the radial direction only.

Answer: D

▶ **Watch Video Solution**

14. Assuming the mass of Earth to be ten times the mass of Mars, its radius to be twice the radius of Mars and the acceleration due to gravity on the surface of Earth is $10m/s^2$.

Then the accelration due to gravity on the surface of Mars is given by

A. $0.4ms^{-2}$

B. $2ms^{-2}$

C. $4ms^{-2}$

D. $5ms^{-2}$

Answer: C

▶ **Watch Video Solution**

15. A uniform copper rod 50 cm long is insulated on the sides, and has its ends exposedto ice and steam,respectively. If there is a layer of water 1 mm thick at each end, calculate the temperature gradient in the bar. The thermal conductivity of copper is $436Wm^{-1}K^{-1}$ and that of water is $0.436Wm^{-1}K^{-1}$.

   A. 60

   B. 40

   C. 50

D. 65

Answer: B

▶ **Watch Video Solution**

---

16. A carnot engine takes 300 cal. of heat at

500 k and rejects 150 cal of heat to the sink.

The temperature (in k) of sink is _____.

A. 125 K

B. 250 K

C. 750 K

D. 1000 K

Answer: B

▶ **Watch Video Solution**

17. The pressure and density of a given mass of a diatomic gas $\left(\gamma = \dfrac{7}{5}\right)$ change adiabatically from (p, d) to (p', d'). If $\dfrac{d'}{d} = 32$, then $\dfrac{p'}{p}$ is $(\gamma$ = ration of specific heat).
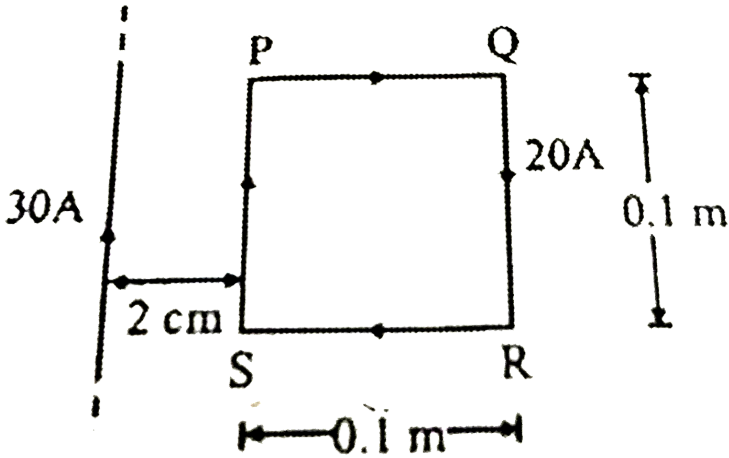
A. 32

B. $1/32$

C. 128

D. $1/128$

Answer: C

▶ **Watch Video Solution**

18. The resultant force on a square current loop PQRS due to a long current carrying conductor will be (if the current flow in the

loop is clockwise)

A. $10^{-4}N$

B. $3.6 \times 10^{-4}N$

C. $1.8 \times 10^{-4}N$

D. $5 \times 10^{-4}N$

Answer: D

19. A short bar magnet placed with its axis at $30°$ with a uniform external magnetic field of 0.25 T experiences a torque of magnitude equal to $4.5 \times 10^{-2} J$. What is the magnitude of magnetic moment of the magnet ?

A. $0.36 J/T$

B. $0.25 J/T$

C. $1.65 J/T$

D. $1.05 J/T$

Answer: A

20. Flow rate of blood through a capillary of cross - sectional are of $0.25m^2$ is $100cm^3/s$. The velocity of flow of blood iis

A. $0.1mm/s$

B. $0.2mm/s$

C. $0.3mm/s$

D. $0.4mm/s$

Answer: D

21. A helicopter is flying horizontally at an altitude of 2km with a speed of $100ms^{-1}$. A packet is dropped from it. The horizontal distance between the point where the packet is dropped and the point where it hits the ground is $\left(g = 10ms^{-2}\right)$

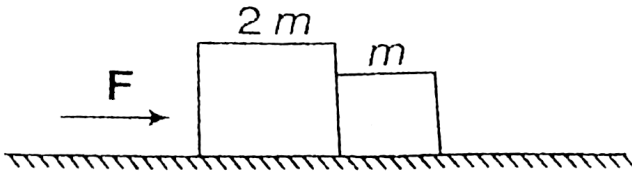A. $2km$

B. $0.2km$

C. $20km$

D. $4km$

Answer: A

▶ **Watch Video Solution**

---

22. Two blocks are in contact on a frictionless table. One has mass m and the other 2m. A force F is applied on 2m as shown in the figure. Now the same force F is applied from

the right on m. In the two cases the ratio of force of contact between the two blocks will be

A. $2:1$

B. $1:3$

C. $1:2$

D. $3:1$

Answer: C

23. The net force acting is not zero on

    A. A retarding train

    B. A ball falling with terminal velocity

    C. A kite held stationary

    D. A truck moving with constant velocity

Answer: A

24. If radius of the $._{13}^{27} Al$ nucleus is taken to be R_{AI}, then the radius of $._{53}^{125} Te$ nucleus is nearly

A. $\dfrac{5}{3} R_1$

B. $\dfrac{3}{5} R_1$
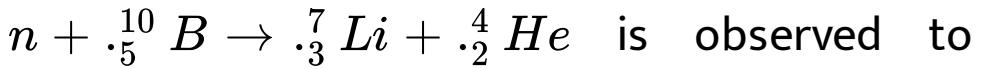
C. $\left(\dfrac{13}{53}\right)^{\frac{1}{2}} R_1$

D. $\left(\dfrac{53}{13}\right)^{\frac{1}{3}} R_1$

Answer: A

▶ Watch Video Solution

25. The nuclear reaction $n + {}_{5}^{10}B \rightarrow {}_{3}^{7}Li + {}_{2}^{4}He$ is observed to occur even when very slow-moving neutrons $(M_n = 1.0087amu)$ strike a boron atom at rest. For a particular reaction in which $K_n = 0$, the helium $(M_{He} = 4.0026amu)$ is observed to have a speed of $9.30 \times 10^6 ms^{-1}$. Determine (a) the kinetic energy of the lithium $(M_{Li} = 7.0160amu)$ and (b) the Q value of the reaction.

A. 2.80 MeV

B. 2.82 MeV

C. 2.85 MeV

D. 2.88 MeV

Answer: B

▶ **Watch Video Solution**

26. A child swinging on a swing in sitting position, stands up, then the time period of the swing will.

A. Time period decreases

B. Time period increases

C. Remains constant

D. First increases and then remains

   constant

Answer: A

▶ **Watch Video Solution**

27. A body of mass m is suspended from vertical spring and is set into simple harmonic oscillations of time period T. Next the spring is fixed at one end on a smooth horizontal table and same body is attached at the other end. The body is pulled slightly and then released to produce horizontal oscillations of the spring. The time period of horizontal oscillations is

A. T

B. 2T

C. $\dfrac{T}{2}$

D. Infinite as the spring does not oscillate

Answer: A

28. In experiment of Davisson-Germer, emitted electron from filament is accelerated through voltage V then de-Broglie wavelength of that electron will be _____m.

A. $\dfrac{2V_{em}}{\sqrt{h}}$

B. $\dfrac{\sqrt{h}}{2V_{em}}$

C. $\dfrac{\sqrt{2V_{em}}}{h}$

D. $\dfrac{h}{\sqrt{2V_{em}}}$

Answer: D

▶ **Watch Video Solution**

29. If λ_1 and λ_2 denote the de-Broglie wavelength of two particles with same masses but charges in the ratio of $1:2$ after they are

accelerated from rest through the same potential difference, then

A. $\lambda_1 = \lambda_2$

B. $\lambda_1 < \lambda_2$

C. $\lambda_1 > \lambda_2$

D. none of the options

Answer: C

> ▶ **Watch Video Solution**

30. A capillary tube of radius r is immersed in water and water rises in to a height h. The mass of water in the capillary tube is 5g. Another capillary tube of radius 2 r is immersed in water. The mass of water that will rise in this tube is
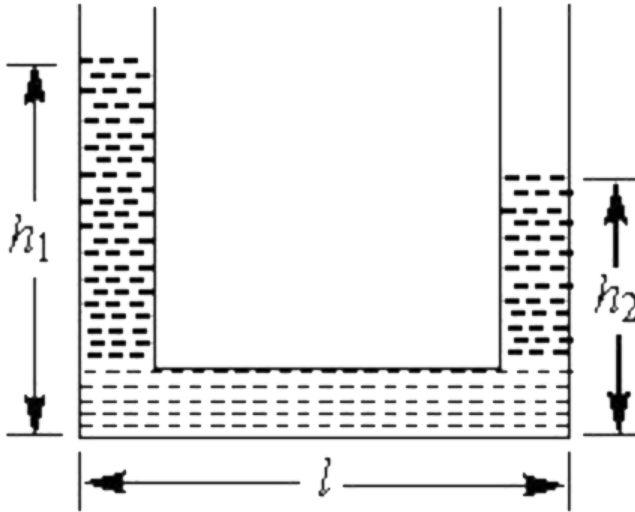
A. 2.5 g

B. 5.0 g

C. 10 g

D. 20 g

Answer: C

31. A liquid of density ρ is filled in a U-tube is accelerated with an acceleration a so that the height of liquid in its two vertical arms are h_1 and h_2 as shown in the figure. If l is the length of horizontal arm of the tube, the

acceleration a is

A. $\dfrac{g(h_1 - h_2)}{2l}$ towards right

B. $\dfrac{g(h_1 - h_2)}{2l}$ towards left

C. $\dfrac{g(h_1 - h_2)}{l}$ towards right

D. $\dfrac{g(h_1 - h_2)}{l}$ towards left

Answer: C

32. A point object is placed at a distance of $25cm$ from a convex lens of focal length $20cm$ .If a glass slab of thickness t and refractive index 1.5 is inserted between the lens and object.The image is formed at infinity .Find the thickness?

A. 15 cm

B. $-15cm$

C. $5cm$

D. $-5cm$

Answer: A

33. Two thin lenses of focal lengths 20cm and 25cm are placed in contact. The effective power of the combination is
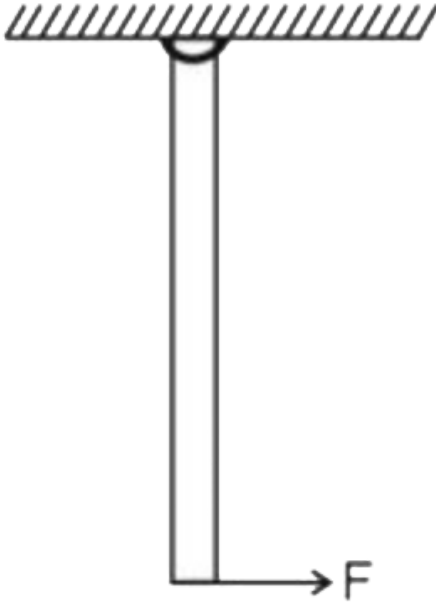
A. 4.5 D

B. 18 D

C. 45 D

D. 9 D

Answer: D

▶ **Watch Video Solution**

34. A uniform bar of mass m is supported by a

pivot at its top about which the bar can swing

like a pendulum. If a force F is applied

perpendicular to the lower end of the bar as

shown in figure, what is the value of F in order

to hold the bar in equilibrium at an angle (θ)

from the vertical

A. $2mg\sin\theta$

B. $mg\sin\theta$

C. $\dfrac{mg}{2}\sin\theta$

D. $\dfrac{mg}{2}\cos\theta$

Answer: C

▶ **Watch Video Solution**

35. A comet orbits around the Sun in an elliptical orbit. Which of the following quantities remains constant during the course of its motion?

A. Linear velocity

B. Angular velocity

C. Angular momentum

D. Potential energy

Answer: C

36. The dominant mechanisms for motion of charge carriers in forward and reverse biased silicon $P - N$ junction are

A. Drift in forward bias, diffusion in reverse bias

B. Diffusion in forward bias, drift in reverse bias

C. Diffusion in both forward and reverse bias

D. Drift in both forward and reverse bias

Answer: B

▶ **Watch Video Solution**

37. In n-p-n transistor circuit, the collector current is 20 mA. If 90% of the electrons emitted reache the collector, then the

    A. Emitter currect will be about 16 mA

    B. Emitter current will be 19 mA

    C. Base current will be about 2 mA

    D. Base current will be about 10 mA

Answer: C

38. If pressure and temperature of an ideal gas are doubled and volume is halved, the number of molecules of the gas

A. Become half

B. Become two times

C. Become four times

D. Remain constant

Answer: B

▶ **Watch Video Solution**

39. The dimensional formula for Planck's constant (h) is _____

A. $\left[ML^{-3}T^{-1}\right]$

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

C. $\left[M^0L^{-1}T^{-3}\right]$

D. $\left[ML^2T^{-1}\right]$

Answer: D

▶ **Watch Video Solution**

40. A parallel beam of monochromatic light of wavelength 5000Å is incident normally on a single narrow slit of width 0.001mm. The light is focused by a convex lens on a screen placed on the focal plane. The first minimum will be formed for the angle of diffraction equal to

A. $0°$

B. $15°$

C. $30°$

D. $50°$

Answer: C

41. If the wavelength of light used is 6000 Å. The angular resolution of telescope of objective lens having diameter 10 cm is _____ rad.

A. 7.55×10^{-6}

B. 6.10×10^{-6}

C. 6.55×10^{-6}

D. 7.32×10^{-6}

Answer: D

▶ **Watch Video Solution**

42. A tuning fork is in resonance with a vibrating string under tension. When the tuning fork is moved with a certain velocity, 2 beats per second are heard. If the tension is increased, the beats disappear again. The direction of motion of the tuning fork is

A. toward the string

B. away from the string

C. random

D. unpredictable as data is not sufficient

Answer: A

▶ **Watch Video Solution**

43. The maximum transverse velocity and maximum transverse acceleration of a harmonic wave in a one - dimensional string

are $1ms^{-1}$ and $1ms^{-2}$ respectively. The phase velocity of the wave is $1ms^{-1}$. The waveform is

A. $\sin(x - t)$
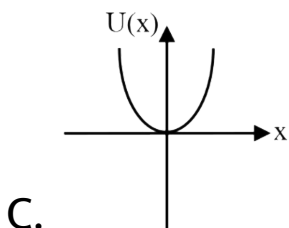
B. $\sin(x - 2t)$
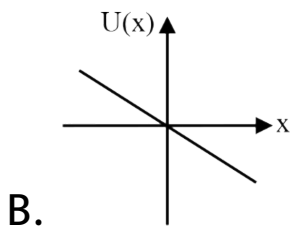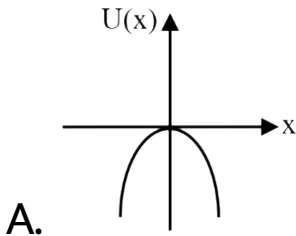
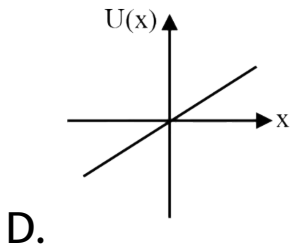C. $\sin\left(\dfrac{x}{2} - t\right)$

D. $\sin\left(x - \dfrac{t}{2}\right)$

Answer: A

▶ Watch Video Solution

44. A particle is placed at the origin and a force F=Kx is acting on it (where k is a positive constant). If $U_{(0)} = 0$, the graph of $U(x)$ verses x will be (where U is the potential energy function.)

A.

B.

C.

U(x)

D.

Answer: A

> ▶ **Watch Video Solution**

---

45. A satellite is orbiting the Earth in a circular orbit of radius R. Which one of the following statement it is true?

A. Angular moment varies as $\dfrac{1}{\sqrt{R}}$

B. Linear moment varies as $\sqrt{R}$

C. Frequency of revolution varies as $\sqrt{R}$

D. Kinetic energy varies as $\dfrac{I}{R}$

Answer: D

▶ **Watch Video Solution**