

# PHYSICS

## BOOKS - NTA MOCK TESTS

### NTA NEET SET 72

#### Physics

1. The number of revolutions per second made by an electron in the first Bohr orbit of hydrogen atom is of the order of 3:

A.  $6.57 \times 10^{15}$

B.  $6.57 \times 10^{13}$

C.  $6.57 \times 10^{11}$

D.  $6.57 \times 10^{14}$

**Answer: A**



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2. Given a sample of radius -226 having half-life of 4 days. Find, the probability, a nucleus disintegrates after 2 half lifes.

A. 1

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

C. 1.5

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

**Answer: B**



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**3.** A ball of mass  $m$  moving at a speed  $v$  makes a head on inelastic collision with an identical ball at rest. The kinetic energy of the balls

after the collision is  $\frac{3}{4}$ th of the original. Find the coefficient of restitution.



- A.  $\frac{1}{\sqrt{3}}$
- B.  $\frac{1}{\sqrt{2}}$
- C.  $\sqrt{2}$

D.  $\sqrt{3}$

**Answer: B**



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4. A satellite in a force-free space sweeps stationary interplanetary dust at a rate  $\frac{dM}{dt} = \beta v$ , where  $v$  is the speed of escaping dust w.r.t. satellite and  $M$  is the mass of satellite at that instant. The acceleration of satellite is

A.  $\frac{-2\alpha v^2}{M}$

B.  $\frac{-\alpha v^2}{M}$

C.  $\frac{-\alpha v^2}{2M}$

D.  $-\alpha v^2$

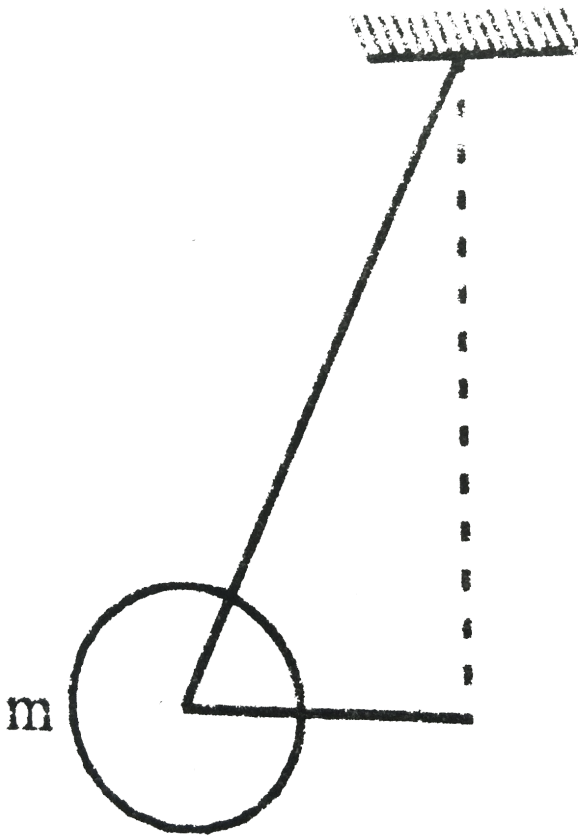
**Answer: B**



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5. A ball of mass ( $m$ ) $0.5kg$  is attached to the end of a string having length ( $L$ ) $0.5m$ . The ball is rotated on a horizontal circular path

about vertical axis. The maximum tension that the string can bear is  $324\text{N}$ . The maximum possible value of angular velocity of ball (in  $\text{radian//s}$ ) is -



A. 9

B. 18

C. 27

D. 36

**Answer: D**



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6. A car is moving on a circular level road of curvature  $300m$  . If the coefficient of friction is



0.3 and acceleration due to gravity is  $10\text{m} / \text{s}^2$

, the maximum speed of the car be

A.  $30\text{km h}^{-1}$

B.  $81\text{km h}^{-1}$

C.  $108\text{km h}^{-1}$

D.  $162\text{km h}^{-1}$

**Answer: C**



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7.  $E$  denotes electric field in a uniform conductor,  $I$  corresponding current through it,  $v_d$  velocity of electrons and  $P$  denotes thermal power produced in the conductor, then which of the following graph is correct?

A. 

B. 

C. 

D. 

**Answer: C**



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8. The resistance of a wire  $R \Omega$  . The wire is stretched to double its length keeping volume constant. Now, the resistance of the wire will become

A.  $4R\Omega$

B.  $2R\Omega$

C.  $1R\Omega$

D.  $\frac{1}{2}R\Omega$

**Answer: A**



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9. An electric motor which is loaded has an effective resistance of  $30\Omega$  and an inductive reactance of  $40\Omega$ . If the motor is powered by a source with a maximum voltage of 420 V, the maximum current is

A.  $6A$

B.  $8.4A$

C. 10A

D. 12A

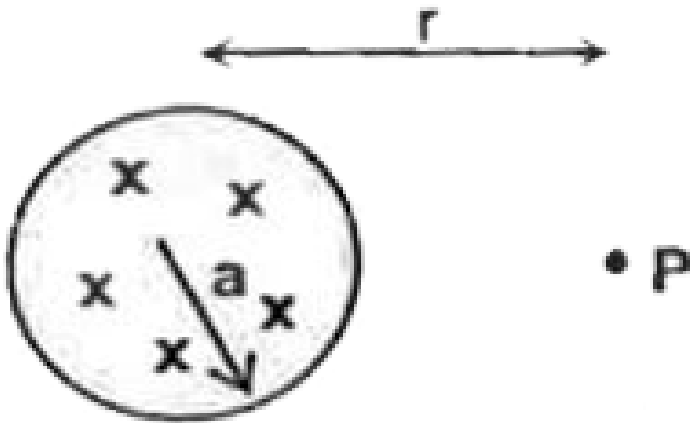
**Answer: B**



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**10.** A uniform but time-varying magnetic field  $B(t)$  exists in a circular region of radius  $a$  and is directed into the plane of the paper as shown . The magnitude of the induced electric field at point P at a distance  $r$  from the centre of the

circular region is



A. Is zero

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

C. Increases as  $r$

D. Decreases as  $\frac{1}{r^2}$

**Answer: B**



11. An electric dipole is placed at an angle of  $30^\circ$  with an electric field intensity  $2 \times 10^5 \text{ N/C}$ . It experiences a torque equal to  $4 \text{ Nm}$ . The charge on the dipole, if the dipole is length is  $2 \text{ cm}$ , is

A.  $8 \text{ mC}$

B.  $2 \text{ mC}$

C.  $5 \text{ mC}$

D.  $7 \mu\text{C}$

**Answer: B**



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**12.** Two uniformly long charged wires with linear densities  $\lambda$  and  $3\lambda$  are placed along X and Y axis respectively. Determine the slope of electric field at any point on the line

$$y = \sqrt{3}x$$

A.  $3\sqrt{3}$

B.  $\frac{\sqrt{3}}{3\sqrt{2}}$



C.  $\frac{1}{3\sqrt{3}}$

D.  $\sqrt{3}$

**Answer: C**



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**13.** The time period of a satellite of earth is 5 hours. If the separation between the centre of earth and the satellite is increased to 4 times the previous value, the new time period will become-

A. 40 h

B. 20 h

C. 10 h

D. 80 h

**Answer: A**



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**14.** The height of the point vertically above the earth's surface, at which acceleration due to

gravitiy becomes 1% of its value at the surface  
is (Radius of the earth =R)

A. 8 R

B. 9 R

C. 10 R

D. 20 R

**Answer: B**



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15. If the temperature of the sun were to increase from  $T$  to  $2T$  and its radius from  $R$  to  $2R$ , then the ratio of the radiant energy received on earth to what it was previously will be

A. 4

B. 16

C. 32

D. 64

**Answer: D**



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**16.** A Carnot engine working between 300 K and 400 K has 800 J of useful work. The amount of heat energy supplied to the engine from the source is

A. 2400 J

B. 3200 J

C. 1200 J

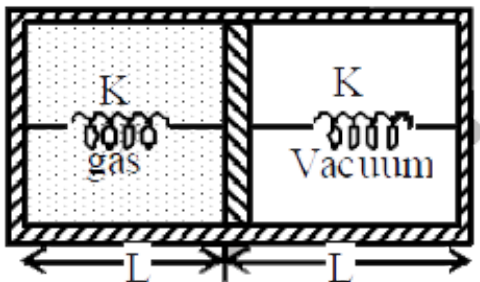
D. 3600 J

**Answer: B**



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17. When heat is supplied to the gas it expands and displaces piston by  $L/2$  where natural length of springs are  $L = 1$  m. Spring constant  $K = 100$  N/m. Area of piston is  $1\text{m}^2$ . The pressure of gas in final situation is



A.  $50Nm^{-2}$

B.  $100Nm^{-2}$

C.  $200Nm^{-2}$

D.  $400Nm^{-2}$

**Answer: B**



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**18.** A galvanometer with a scale divided into 100 equal divisions has a current sensitivity of 10 divisions per mA and a voltage sensitivity of

2 divisions per mV. What adoptions are required to read (i)  $5A$  for full scale and (ii) 1 division per volt?

A.  $4\Omega$

B.  $5\Omega$

C.  $3\Omega$

D.  $7\Omega$

**Answer: B**



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19. An electron (mass =  $9.1 \times 10^{-31} \text{ kg}$ , charge =  $1.6 \times 10^{-19} \text{ C}$ ) experiences no deflection if subjected to an electric field of  $3.2 \times 10^5 \frac{\text{V}}{\text{m}}$ , and a magnetic field of  $2.0 \times 10^{-3} \text{ W} \frac{\text{b}}{\text{m}^2}$ . Both the fields are normal to the path of electron and to each other. If the electric field is removed, then the electron will revolve in an orbit of radius

A. 45 m

B. 4.5 m

C. 0.45 m

D. 0.045 m

**Answer: C**



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20. The real angle of dip, if a magnet is suspended at an angle of  $30^\circ$  to the magnetic meridian and the dip needle makes an angle of  $45^\circ$  with horizontal, is:

A.  $\tan^{-1} \left( \frac{\sqrt{3}}{2} \right)$

B.  $\tan^{-1}(\sqrt{3})$

C.  $\tan^{-1}\left(\frac{\sqrt{3}}{\sqrt{2}}\right)$

D.  $\tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$

**Answer: A**



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**21.** The  $x$  and  $y$  coordinates of a particle at any time  $t$  are given by  $x = 7t + 4t^2$  and  $y = 5t$ , where  $x$  and  $t$  is seconds. The acceleration of particle at  $t = 5$  s is

A. zero

B.  $8ms^{-2}$

C.  $20ms^{-2}$

D.  $40ms^{-2}$

**Answer: B**



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**22.** A large number of bullets are fired in all directions with the same speed  $v$ . Find the

maximum area on the ground on which these bullets will spread.

A.  $\pi \frac{v^2}{g}$

B.  $\pi \frac{v^4}{g}$

C.  $\pi^2 \frac{v^4}{g^2}$

D.  $\pi^2 \frac{v^2}{g^2}$

**Answer: B**



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23. A body of mass 50 kg is suspended using a spring balance inside a lift at rest. If the lift starts falling freely, the reading of the spring balance is

A.  $< 50\text{kg}$

B.  $= 50\text{kg}$

C.  $> 50\text{kg}$

D.  $= 0$

**Answer: D**



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24. The normal reaction on a body placed in a lift moving up with constant acceleration  $2\text{ms}^{-1}$  is 120 N. Mass of the body is (Take  $g = 10\text{ms}^{-2}$ )

A. 10 kg

B. 15 kg

C. 12 kg

D. 5 kg

**Answer: A**



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**25.** One microgram of matter converted into energy will give.

A.  $9 \times 10^7 J$

B.  $9 \times 10^3 J$

C.  $9 \times 10^{10} J$

D.  $9 \times 10^5 J$



**Answer: C**



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**26.** In a radioactive disintegration, the ratio of initial number of atoms to the number of atoms present at an instant of time equal to its mean life is

A.  $\frac{1}{e^2}$

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

C.  $e$

D.  $e^2$

**Answer: C**



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27. A particle of mass 3 kg , attached to a spring with force constant  $48Nm^{-1}$  execute simple harmonic motion on a frictionless horizontal surface. The time period of oscillation of the particle, is seconds , is

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

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

C.  $2\pi$

D.  $8\pi$

**Answer: B**



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**28.** A point performs simple harmonic oscillation of period  $T$  and the equation of motion is given by  $x = a \sin\left(\omega t + \frac{\pi}{6}\right)$ . After the elapse of what fraction of the time period,

the velocity of the point will be equal to half of its maximum velocity ?

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

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

C.  $\frac{T}{8}$

D.  $\frac{T}{6}$

**Answer: B**



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29. Huygen's wave theory of light could not explain

A. Photoelectric effect

B. Polarisation

C. Diffraction

D. Interference

**Answer: A**



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**30.** At its closet approach, the distance between the mars and the earth is found to be 60 million km. When the planets are at this closet distance, how long would it take to send a radio message from a space probe of mars to earth?

A. 5 s

B. 200 s

C. 0.2 s

D. 500 s

**Answer: B**



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**31.** A block of wood floats in freshwater with two - third of its volume submerged . In oil , the block floats with one - fourth of its volume submerged. The density of oil is

A.  $2666.7 \text{kgm}^{-3}$

B.  $5333.3 \text{kgm}^{-3}$

C.  $1333.3 \text{kgm}^{-3}$

D.  $3333.3 \text{kgm}^{-3}$

**Answer: A**



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**32.** An ideal fluid flows through a pipe of circular cross - section with diameters 5 cm and 10 cm as shown in the figure. The ratio of



velocities of fluid at A and B is



A. 4 : 1

B. 1 : 4

C. 2 : 1

D. 1 : 2

**Answer: A**



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**33.** An astronomical telescope has an angular magnification of magnitude 5 for distant object. The separation between the objective and the eyepiece is 36 cm and the final image is formed at infinity. The focal length  $f_0$  of the objective and the focal length  $f_0$  of the eyepiece are

A.  $45\text{cm}$  and  $-9\text{cm}$

B.  $50\text{cm}$  and  $10\text{cm}$

C.  $72\text{cm}$  and  $2\text{cm}$

D.  $30\text{cm}$  and  $6\text{cm}$

**Answer: D**



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**34.** A compound microscope having magnifying power 35 with its eye - piece of focal length 10 cm. Assume that the final image is at least distance of distinct vision then the magnification produced by the objective is

A.  $-4$

B.  $5$

C.  $10$

D.  $-10$

**Answer: D**



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**35.** When a ceiling fan is switched off, its angular velocity falls to half while it makes 36

rotations. How many more rotations will it make before coming to rest ?

A. 24

B. 36

C. 18

D. 12

**Answer: D**



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**36.** If a body is lying in the Y-Z plane, then according to theorem of perpendicular axes the correct expression will be

A.  $I_z = I_x + I_y$

B.  $I_y = I_x + I_z$

C.  $I_x = I_y + I_z$

D.  $I_y = I_z + Mh^2$

**Answer: C**



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**37.** With forward biased mode, the p-n junction diode

A. is one in which width of depletion layer

increases

B. is one in which potential barrier

increases

C. acts as closed switch

D. acts as open switch

**Answer: C**



**38.** A transistor is used as an amplifier in  $CB$  mode with a load resistance of  $5k\Omega$  the current gain of amplifier is 0.98 and the input resistance is  $70\Omega$ , the voltage gain and power gain respectively are

- A. 70
- B. 80
- C. 60
- D. 90



**Answer: A**



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**39.** The total kinetic energy of a mixture of 4 g of  $H_2$  and 4g of He at 300 K is

- A. 1800 R
- B. 1750 R
- C. 1950 R
- D. 2500 R

**Answer: C**



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**40.** The S.I. unit of specific heat capacity is

A.  $JK^{-1}$

B.  $Jkg^{-1}$

C.  $J\text{ mol}^{-1}K^{-1}$

D.  $Jkg^{-1}K^{-1}$

**Answer: D**



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41. In a Young's double slit experiment, the fringe width is found to be  $0.4\text{mm}$ . If the whole apparatus is immersed in water of refractive index  $4/3$  without disturbing the geometrical arrangement, the new fringe width will be

A.  $0.30\text{ mm}$

B.  $0.40\text{ mm}$

C.  $0.53\text{ mm}$

D. 450 microns

**Answer: A**



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**42.** In a double slit experiment, the distance between slits is increased ten times whereas their distance from screen is halved then the fringe width is

A. Becomes  $\frac{1}{20}$  th

B. Becomes  $\frac{1}{90}$  th

C. Remains same

D. Becomes  $\frac{1}{10}$  th

**Answer: A**



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**43.** If the end correction of an open pipe is 0.8 cm, then the inner radius of that pipe will be

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

B.  $\frac{2}{3}$  cm

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

D. 0.2 cm

**Answer: B**



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**44.** A string is hanging from a rigid support. A

transverse

pulse is excited at its free end. The speed at

which the

pulse travels a distance  $x$  is proportional to

A.  $x^2$

B.  $x$

C.  $\sqrt{x}$

D.  $1/x$

**Answer: C**



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45. A particle moves with a velocity  $(5\hat{i} - 3\hat{j} + 6\hat{k})\text{ms}^{-1}$  under the influence of a constant force  $\vec{F} = (10\hat{i} - 10\hat{j} + 20\hat{k})\text{ N}$ . The instantaneous power applied to the particle is

A. 140 W

B. 40 W

C. 200 W

D. 170 W

**Answer: C**





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