doubtnut
India's Number 1 Education App

PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 65

Physics

1. In Bohr's model of the hydrogen atom, the pairs of quantities that are quantized among the following is

A. Energy and linear momentum

B. Angular and linear momentum

C. Energy and angular momentum

D. None of these

Answer: C

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2. If λ_1 and λ_2 are the wavelengths of the first members of the Lyman and paschen series respectively, then $\frac{\lambda_1}{\lambda_2}$ is equal to

A. $1:3$

B. $1:30$

C. $7:50$

D. $7:108$

Answer: D

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3. A sphere P of mass m moving with velocity u collides head on with another sphere Q of mass m which is at rest . The ratio of final velocity of Q to initial velocity of P is

(e = coefficient of restitution)

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

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

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

D. e

Answer: C

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4. A bomb of mass $30kg$ at rest explodes into two pieces of mass $18kg$ and $12kg$. The velocity of mass $18kg$ is $6m/s$. The kinetic energy of the other mass is

A. 324 J

B. 486 J

C. 256 J

D. 523 J

Answer: B

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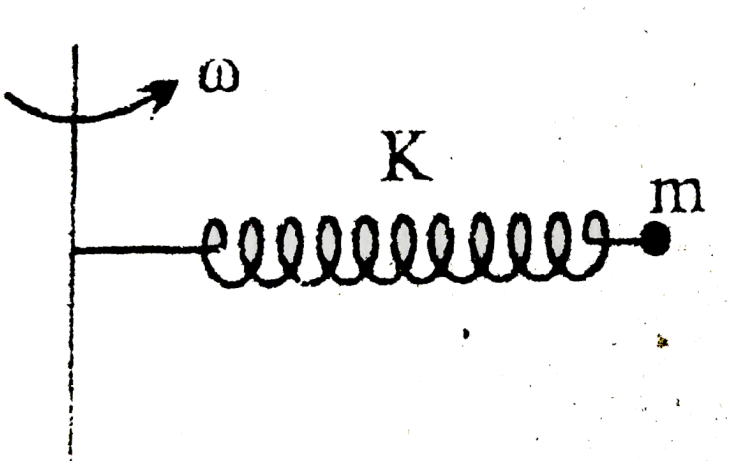
5. A particle of mass m is fixed to one end of a light spring of force constant k and unstretched length l. the system is rotated about the other end of the spring with an angular velocity ω in gravity free

space. The increase in length of the spring is



A. $\frac{m\omega^2 l}{k}$

B. $\frac{m\omega^2 l}{k - m\omega^2}$

C. $\frac{m\omega^2 l}{k + m\omega^2}$

D. None of these

Answer: B

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6. The kinetic energy K of a particle moving along a circle of radius R depends on the distance covered a as $K = as^2$. The force acting on the particle is

A. 2 as R

B. $2as^2$

C. 2as

D. $\frac{2as^2}{R}$

Answer: D

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7. The massses of the three wires of copper are in the ratio 1 : 3 : 5. And their lengths are in th ratio 5 : 3 : 1. the ratio of their electrical resistance is

A. $1:3:5$

B. $5:3:1$

C. $1:15:125$

D. $125:15:1$

Answer: D

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8. Two wires of equal diameters of resistivies ρ_1 and ρ_2 and lengths l and l respectively are joined in series. The equivalent resistivity of the combination is

A. $\frac{\rho_1 l_1 + \rho_2 l_2}{l_1 + l_2}$

B. $\frac{\rho_1 l_2 + \rho_2 l_1}{l_1 - l_2}$

C. $\frac{\rho_1 l_2 + \rho_2 l_1}{l_1 + l_2}$

D. $\frac{\rho_1 l_1 + \rho_2 l_2}{l_1 - l_2}$

Answer: A

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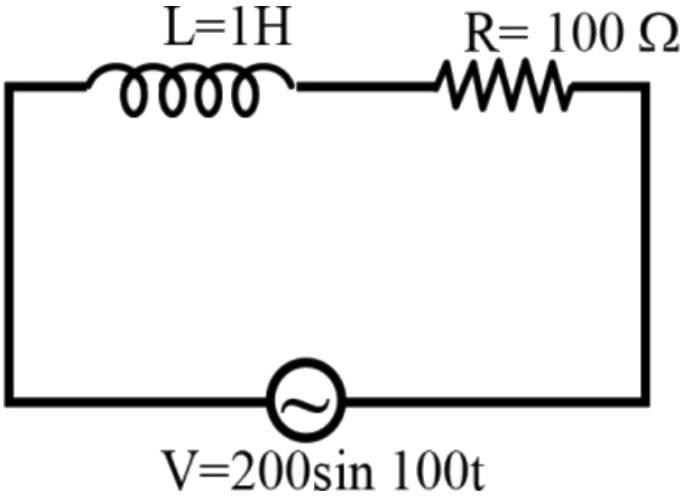
9. In the adjacent circuit , the instantaneous current equation is



A. $2\sin\left(100t-\frac{\pi}{4}\right)$

B. $\sqrt{2}\sin\left(100t-\frac{\pi}{4}\right)$

C. $\sqrt{2}\sin\left(200t-\frac{\pi}{4}\right)$

D. $\sqrt{2}\left(100t+\frac{\pi}{4}\right)$

Answer: B

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10. In series LCR circuit voltage drop across resistance is 8V, across inductor is 6V and across capacitor is 12V. Then

A. the voltage of the source will be leading the current in the circuit

B. the voltage drop across each element will be less than the applied voltage

C. the power factor of the circuit will be $\frac{4}{3}$

D. none of these

Answer: D

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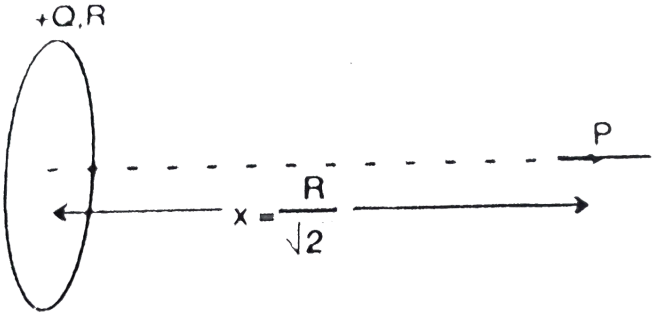
11. A short dipole is placed on the axis of a uniformly charged ring (total charge -Q, radius R) at a distance $\frac{R}{\sqrt{2}}$ from centre of ring as shown in figure. Find the Force on the dipole due to that ring



A. $\frac{4kPQ}{3\sqrt{3}R^2}$

B. $\frac{4kPQ}{3\sqrt{3}R^3}$

C. $\frac{2kPQ}{3\sqrt{3}R^3}$

D. Zero

Answer: D

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12. If the force exerted by an electric dipole on a charge q at distance of 1 m is F, the force at a point 2 m away in the same direction will be

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

B. $\frac{F}{4}$

C. $\frac{F}{6}$

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

Answer: D

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13. A body of mass m is placed at the centre of the spherical shell of radius R and mass M. The gravitation potential on the surface of the shell is

A. $-\frac{G}{H}(M+m)$

B. $-\frac{G}{H}(M-m)$

C. $-\frac{G}{H}\left(\frac{mM}{M+m}\right)$

D. $-\frac{G}{H}\left(\frac{mM}{M-m}\right)$

Answer: A

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14. The weight of a body at the centre of the earth is

A. $9.8ms^{-2}$

B. 0

C. $4.9ms^{-2}$

D. $10ms^{-2}$

Answer: B

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15. A body having a temperature of $27^\circ C$ is kept in a room having a temperature of $27^\circ C$. Does the body emit any radiation in this case when the room temperature is the same as body temperature ?

A. Yes

B. No

C. May emit , depends on the material of body

D. Can't say anything

Answer: A

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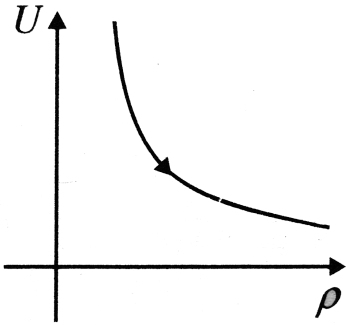
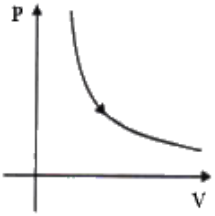
16. Variation of internal energy with density of 1mole of monatomic gas is depicted in Fig. Corresponding variation of pressure with voluem can be depicted as (assume the curve is rectangular

hyperbola)



A.



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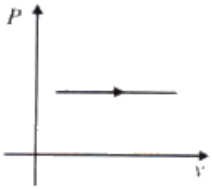

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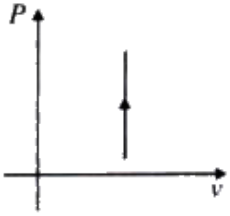
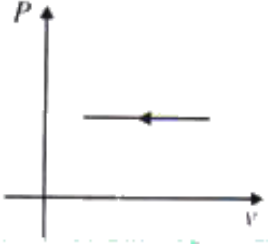


D. 

Answer: D

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17. The coeffcient of performance of a refrigerator working between $10^\circ C$ and $20^\circ C$ is

A. 28.3

B. 29.3

C. 2

D. 0.5

Answer: A

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18. A proton an an $\alpha -$ particle, moving with the same velocity, enter a uniform magnetic field, acting normal to the plane of their motion. The ratio of the radii of the circular paths descirbed by the proton and α-particle is

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer: B

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19. When a charged particle moving with velocity $\overrightarrow{V}$ is subjected to a magnetic field of induction $\overrightarrow{B}$ the force on it is non-zero. This implies

that:

A. angle between $\vec{v}$ and $\vec{B}$ is either zero or 180°

B. angle between $\vec{v}$ and $\vec{B}$ is necessarily 90°

C. angle between $\vec{v}$ and $\vec{B}$ can have any value other than 90°

D. angle between $\vec{v}$ and $\vec{B}$ can have any value other than zero and 180°

Answer: D

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20. The magnetic needle of a vibration magnetometer makes 12 oscillations per minute in the horizontal component of earth's magnetic field. When an external short bar magnet is placed at some distance along the axis of the needle in the same line it makes 15 oscillations per minute. If the poles of the bar magnet are inter changed, the number of oscillations it takes per minute is

A. $\sqrt{61}$

B. $\sqrt{63}$

C. $\sqrt{65}$

D. $\sqrt{67}$

Answer: B

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21. A body is projected vertically upwatds at time t=0 and is it seen at a height H at time t_1 and t_2 second during its flight. The maximum height attainet is (g is acceleration due to garavity).

A. $\frac{g}{4}(t_1+t_2)^2$

B. $g\left(\frac{t_1+t_2}{4}\right)^2$

C. $2g\left(\frac{t_1+t_2}{4}\right)^2$

D. $\frac{g}{4}(t_1t_2)$

Answer: C

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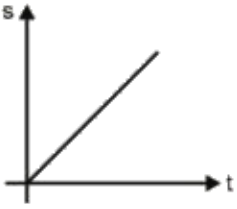
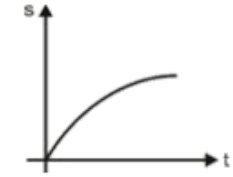
22. One stone is dropped from a tower from rest and simultaneously another stone is projected vertically upwards from the tower with some initial velocity. The graph of distance (s) between the two stones varies with time (t) as (before either stone hits the ground).

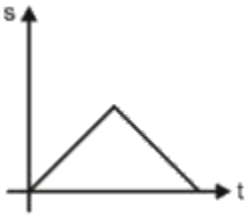
A.



B.



C.

D. 

Answer: A

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23. A block of mass 1 kg lies on a horizontal surface in a truck. The coefficient of static friction between the block and the surface is 0.6. If the acceleration of the truck is $5m/s^2$, the frictional force acting on the block is.....newtons.

A. 5 N

B. 6 N

C. 10 N

D. 15 N

Answer: A

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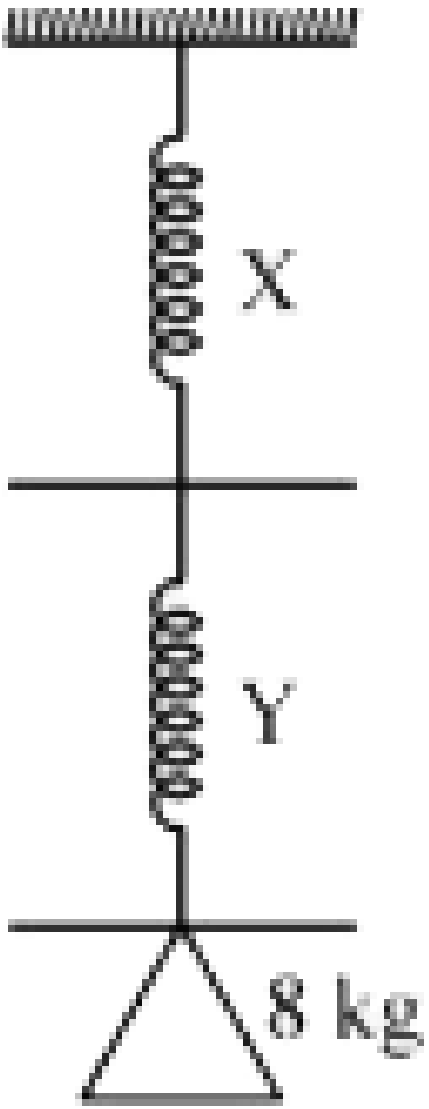
24. A body of mass 8 kg is suspended through two light springs X and Y connected in series as shown in figure. The readings is X and Y

respectively are :



A. 8 kg , zero

B. Zero , 8 kg

C. 6 kg , 2 kg

D. 8 kg, 8 kg

Answer: D

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25. How many α and β-particles are emitted in the transformation ${}_{92}^{238}U \rightarrow {}_{92}^{234}U$

A. 2α and 2β

B. 1α and 2β

C. 1α only

D. 2β and 2α

Answer: B

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26. In nuclear reaction $._4 Be^9 + ._2 He^4 \rightarrow ._6 C^{12} + X$, X will be

A. Neutron

B. Proton

C. Positron

D. Electron

Answer: A

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27. The time period of oscillations of a block attached to a spring is t_1. When the spring is replaced by another spring, the time period of the block is t_2. If both the springs are connected in series and the block is

made to oscillate using the combination, then the time period of the block is

A. $T = t_1 + t_2$

B. $T^2 = t_1^2 + t_2^2$

C. $T^{-1} = t_1^{-1} + t_2^{-1}$

D. $T^{-2} = t_1^{-2} + t_2^{-2}$

Answer: B

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28. The phase difference between two waves represented by $y_1 = 10^{-6}\sin[100t + (x/50) + 0.5]m$, $y_2 = 10^{-6}\cos[100t + (x/50)]m$ where x is expressed in meters and t is expressed in seconds, is approximately

A. 1.07 rad

B. 2.07 rad

C. 0.5 rad

D. 1.5 rad

Answer: A

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29. The maximum kinetic energy of a photoelectron is 3 eV. What is its stopping potential ?

A. 3 V

B. 1 V

C. 6 V

D. 2 V

Answer: A

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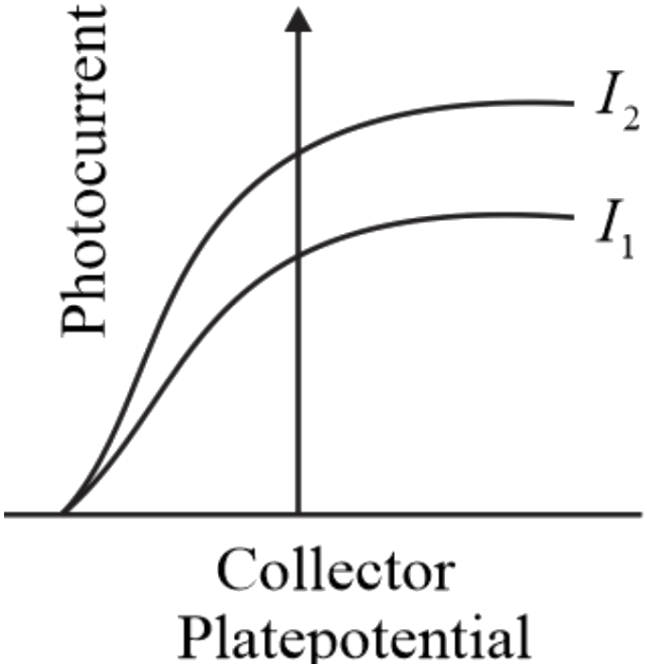
30. From the following graph of photocurrent against collector plate potential for two different intensities of light I_1 and I_2 one can , conclude



A. $I_1 = I_2$

B. $I_1 > I_2$

C. $I_1 < I_2$

D. Comparison is not possible

Answer: C

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31. A liquid drop having surface energy E is spread into 512 droplets of same size. The final surface energy of the droplets is

A. 2E

B. 4E

C. 8E

D. 12E

Answer: C

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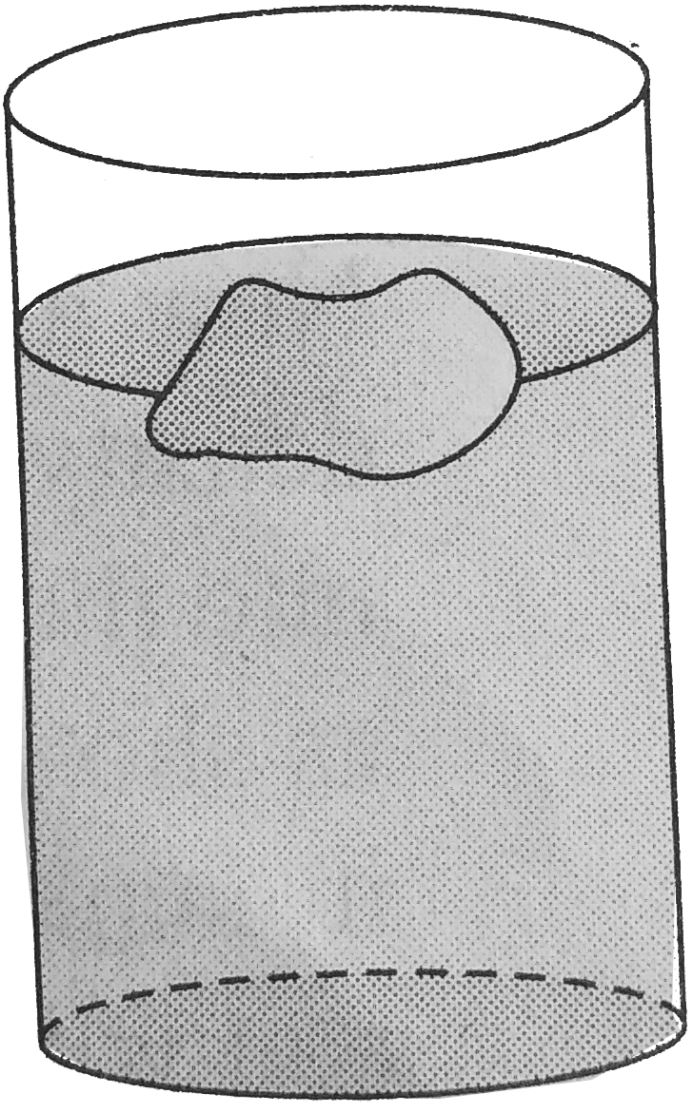
32. A body floats in a liquid contained in a beaker. The whole system as shown falls freely under gravity. The upthrust on the body due to the liquid is



A. Zero

B. Equal to the weight of the immersed part of the body

C. Equal to the weight of the body in liquid

D. Equal to the weight of the body in air

Answer: A

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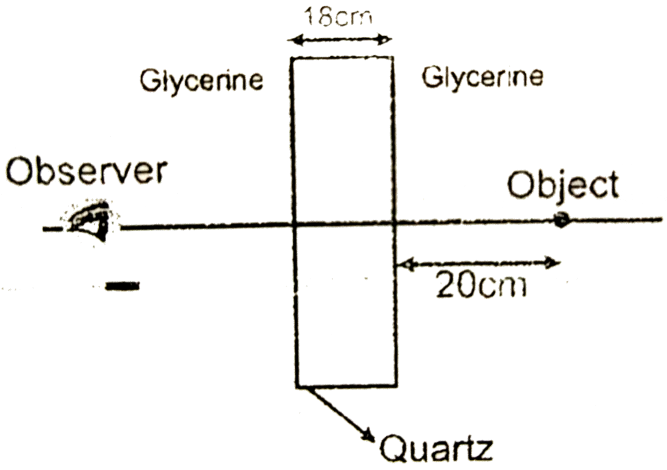
33. Given that, velocity of light in quartz $= 1.5 \times 10^8 m/s$ and velocity of light in glycerine $= 9/40 \times 10^8 m/s$. Now a slab made of quartz is placed in glycerine as shown. The shift of the object

produced by slab is



A. 6 cm

B. 3.55 cm

C. 9 cm

D. 2 cm

Answer: A

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34. Light has the following wave property

A. Laser light always lies in the X - ray region

B. Laser light does not have directionality property

C. Laser light is white light

D. Laser light is highly coherent

Answer: D

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35. On applying a constant torque, a wheel at rest, turns through 400 radian in $10s$. Find angular acceleration. If same torque continues to act, what will be angular veclocity of the wheel after $20s$ from stars ?

A. $8rads^{-2}$

B. $5rads^{-2}$

C. $6rads^{-2}$

D. $7rads^{-2}$

Answer: A

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36. If the ratio of the concentration of electron to that of holes in a semiconductor is $\frac{7}{5}$ and the ratio of current is $\frac{7}{4}$ then what is the ratio of their drift velocities ?

A. $4/7$

B. $5/8$

C. $4/5$

D. $5/4$

Answer: D

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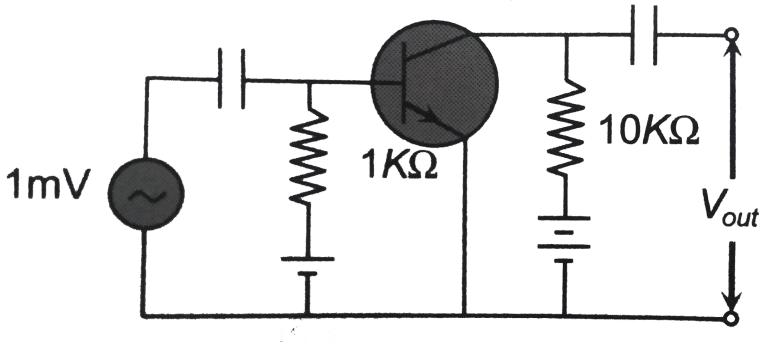
37. In the following common emitter configuration an NPN transistor with current gain $\beta = 100$ is used. The output voltage of the amlifier will be



A. 10 mV

B. 0.1 V

C. 1.0 V

D. 10 V

Answer: C

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38. Coefficient of linear expansion of brass and steel rods are α_1 and α_2. Length of brass and steel rods are l_1 and l_2 respectively. If $(l_2 - l_1)$ is maintained same at all temperature, which one of the following relations holds good?

A. $a_1 l_1 = a_2 l_2$

B. $a_1 l_2 = a_2 l_1$

C. $a_1^2 l_2 = a_2^2 l_1$

D. $a_1 l_2^2 = a_2 l_1^2$

Answer: A

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39. A public park , in the form of a square , has an area of $(100 \pm 0.2) m^2$ The side of park is

A. $(10 \pm 0.01) m$

B. $(10 \pm 0.1)m$

C. $(10.0 \pm 0.1)m$

D. $(10.0 \pm 0.2)m$

Answer: A

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40. In a Young's double slit experiment, 12 fringes are observed to be formed in a certain segment of the screen when light of wavelength 600nm is used. If the wavelength of light is changed to 400nm, number of fringes observed in the same segment of the screen is given by

A. 12

B. 18

C. 24

D. 30

Answer: B

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41. If numerical aperture of a microscope is increased, then its

A. Resolving power remains constant

B. Resolving power becomes zero

C. Limit of resolution is decreased

D. Limit of resolution is increased

Answer: C

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42. A wave of frequency 500 Hz has velocity 360 m/sec. The distance between two nearest points 60° out of phase, is

A. 70 cm

B. 0.7 cm

C. 12.0 cm

D. 120.0 cm

Answer: C

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43. If E and B represent electric and magnetic field vectors of the electromagnetic wave, the direction of propagation of eletromagnetic wave is along.

A. Electric field vector , E

B. Magnetic field vector , B

C. $\overrightarrow{E} \times \overrightarrow{B}$

D. $\overrightarrow{B} \times \overrightarrow{E}$

Answer: C

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44. The potential energy for a force filed $\overrightarrow{F}$ is given by $U(x, y) = \cos(x + y)$. The force acting on a particle at position given by coordinates $(0, \pi/4)$ is

A. $-\frac{1}{\sqrt{2}}\left(\hat{i} + \hat{j}\right)$

B. $\frac{1}{\sqrt{2}}\left(\hat{i} + \hat{j}\right)$

C. $\left(\frac{1}{2}\hat{i} + \frac{\sqrt{3}}{2}\hat{j}\right)$

D. $\left(\frac{1}{2}\hat{i} - \frac{\sqrt{3}}{2}\hat{j}\right)$

Answer: B

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