PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 86

Physics

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1. A difference of 2.3 eV separates two energy

levels in an atom. What is the frequency of

radiation emitted when the atom transits form the upper level to the lower level.

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

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

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

A. $-3.4eV$

B. $-6.8eV$

C. $6.8eV$

D. $3.4eV$

Answer: D

3. A uniform wooden plank of mass 150 kg and length 8 m is floating on still water with a man of 50 kg at one end of it . The man walks to the other end of the plank and stops. Than the distance covered by the plank is

A. 1 m

B. 4 m

C. 2 m

D. Zero

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4. If the external forces acting on a system have zero resultant, the centre of mass

A. May move but not accelerate

B. May Accelerate

C. Must not move

D. None of the above

Answer: A

5. A particle describes a horizontal circle in a conical funne whoses inner surface is smooth with speed of $0.5m/s$. What is the height of the plane of circle from vertex the funnel?

A. 0.25 cm

B. 2 cm

C. 4 cm

D. 2.5 cm

Answer: D

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6. The ratio of magnetic fields due to a bar magnet at the two axial points P_1 and P_2 which are separated from each other by 10 cm is 25 : 2 . Point P_1 is situated at 10 cm from the

centre of the magnet. Magnetic length of the bar magnet is (Points P_1 and P_2 are on the same side of magnet and distance of P_2 from the centre is greater than distance of P_1 from the centre of magnet)

A. 5 cm

B. 10 cm

C. 15 cm

D. 20 cm

Answer: B

7. The drift velocity of the electrons in a copper wire of length 2 m under the application of a potential difference of 220V is $0.5ms^{-1}$. Their mobility (in $m^2v^{-1}s^{-1}$)

A. 2.5×10^{-3}

B. 2.5×10^{-2}

C. 5×10^2

D. 4.5×10^{-3}

Answer: D

8. In the circuit figure, the voltmeter reads 30 V. The resistance of the voltmeter is

A. 1200Ω

B. 700Ω

C. 400Ω

D. 300Ω
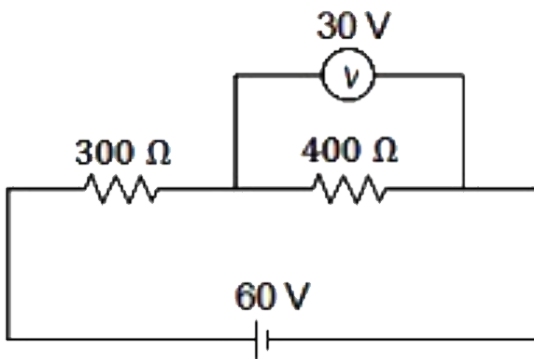
Answer: A

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9. 4×10^{10} electrons are removed from a neutral metal sphere of diameter 20 cm placed in air. The magnitude of the electric field (in

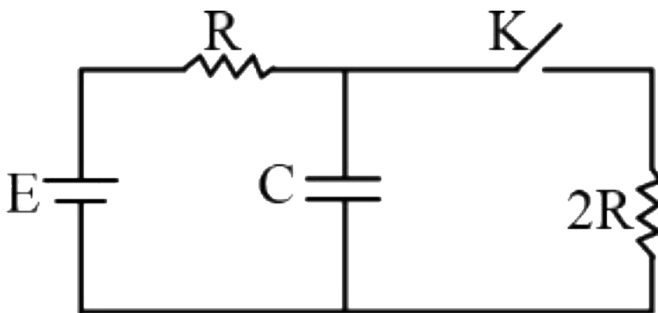NC^{-1}) at a distance of 20 cm from its centre

is

A. 460

B. 5760

C. Zero

D. 1440

Answer: D

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10. In the given circuit switch K is open. The charge on the capacitor is C is steady-state is q_1 Now the key is closed and steady-state charge on C is q_2 The ratio of charges q_1 / q_2 is

-

A. $3/2$

B. $3/1$

C. 1

D. $1/2$

Answer: A

11. A small square loop of wire of side l is placed inside a large square loop of wire of side $L(L > > l)$. The loops are co-planer and their centres coincide. The mutual inductance of the system is proportional to

A. $\dfrac{l}{L}$

B. $\dfrac{l^2}{L}$

C. $\dfrac{l}{L^2}$

D. $\dfrac{l^2}{L^2}$

Answer: B

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12. An ac source is connected to a resistive circuits. Which of the following statements are false ?

A. Current lead ahead of voltage in phase

B. Current lags behind voltage in phase

C. Current and voltage are in same phase

D. Any of the above may be true depending upon the value of resistance

Answer: C

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13. The distance of geostationary satellite from the centre of the earth (radius R) is nearest to

A. 18 R

B. 10 R

C. 7 R

D. 5 R

Answer: C

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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. $-\dfrac{4Gm}{r}$

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

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

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

Answer: C

15. Three discs, A, B and C having radii 2m, 4m and6m respectively are coated with carbon black on their outer surfaces. The wavelengths corresponding to maximum intensity are $300nm$, $400nm$ and $500nm$, respectively. The power radiated by them are Q_A, Q_B and Q_C respectively

(a) Q_A is maximum (b) Q_B is maximum (c) Q_C is maximum (d) $Q_A = Q_B = Q_C$

A. Q_A is maximum

B. Q_B is maximum

C. Q_C is maximum

D. $Q_A = Q_B = Q_C$

Answer: B

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16. The temperature of a gas is raised while its volume remains constant, the pressure exerted by the gas on the walls of the container increases because its molecules

A. Lose more kinetic energy to the wall

B. Are in contact with the for a shorter time

C. Strike the wall more often with higher

D. Collide with each other with less frequency

Answer: C

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17. One mole of an ideal monatomic gas undergoes a process described by the equation PV^3 = constant. The heat capacity of the gas during this process is

A. $\dfrac{3}{2}R$

B. $\dfrac{5}{2}R$

C. 2R

D. R

Answer: D

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18. A coil having N turns is would tightly in the form of a spiral with inner and outer radii a and b respectively. When a current I passes through the coil, the magnetic field at the centre is.

A. $\dfrac{\mu_0 NI}{b}$

B. $\dfrac{2\mu_0 NI}{a}$

C. $\dfrac{\mu_0 NI}{2(b-a)}\log.\dfrac{b}{a}$

D. $\dfrac{\mu_0 IN}{2(b-a)}\log.\dfrac{a}{b}$

Answer: C

19. A charge q is accelerated through a potential difference V . It is then passed normally through a uniform magnetic field , where it moves in a circle of radius r . The potential difference required to move it in a circle of radius 2 r is

A. 2 V

B. 4 V

C. 1 V

D. 3 V

Answer: B

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20. The acceleratin of a particle increases linearly with time t as 6t. If the initial velocity of the particles is zero and the particle starts

from the origin, then the distance traveled by the particle in time t will be

A. t

B. t^2

C. t^3

D. t^4

Answer: C

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. $\dfrac{\pi}{6}$

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

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

Answer: A

22. A heavy uniform chain lies on a horizontal table-top. If the coefficient of friction between the chain and table surface is 0.25, then the maximum fraction of length of the chain, that can hang over one edge of the table is

A. 20 %

B. 25 %

C. 35 %

D. 15 %

Answer: A

23. A player caught a criket ball of mass 150 g moving at the rate of $20ms^{-1}$. If the catching process the completed in 0.1s , the force of the blow exerted by the ball on the hands of the player is

A. 0.3 N

B. 30 N

C. 300 N

D. 3000 N

Answer: B

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24. If the ratio of the radius of a nucleus with 61 neutrons to that of helium nucleus is 3 , then the atomic number of this nucleus is

A. 27

B. 47

C. 51

D. 61

Answer: B

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25. Half–life of a radioactive substance A is 4 days. The probability that a nucleus will decay in two half– lives is

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

B. $\dfrac{3}{4}$

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

D. 1

Answer: B

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26. A horizontal platform with an object placed on it is executing SHM in the vertical direction . The amplitude of oscillation is 2.5 cm what

must be the least period of these oscillations

so that the object is not detached ?

A. πs

B. $\dfrac{\pi}{5} s$

C. $\dfrac{\pi}{10} s$

D. $\dfrac{\pi}{15} s$

Answer: C

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27. The displacement of a particle performing simple harmonic motion is given by, $x = 8\sin\omega t + 6\cos\omega t$, where distance is in cm and time is in second. What is the amplitude of motion?

A. 10 cm

B. 2 cm

C. 14 cm

D. 3.5 cm

Answer: A

28. When two different materials A and B having atomic number Z_1 and Z_2 are used as the target in Coolidge γ - ray tube at different operating voltage V_1 and V_2 respectively their spectrums are found as below.
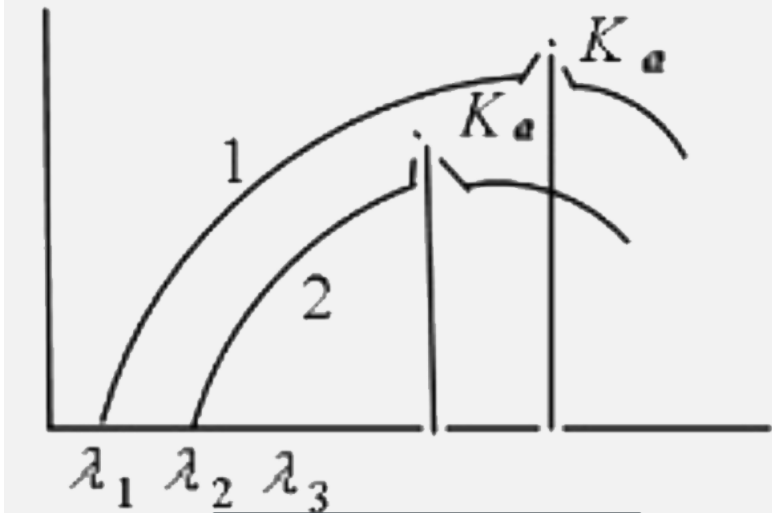
The correct relation is

A. $V_1 > V_2$ and $Z_1 > Z_2$

B. $V_1 < V_2$ and $Z_1 < Z_2$

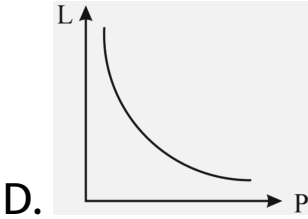C. $V_1 < V_2$ and $Z_1 > Z_2$

D. $V_1 > V_2$ and $Z_1 < Z_2$

Answer: D

29. The de-Broglie wavelength L associated with an elementary particle of linear momentum p is bets represented by the graph

A.

B.

C.

D.
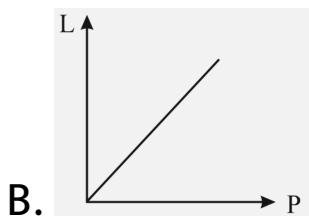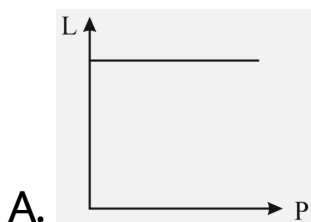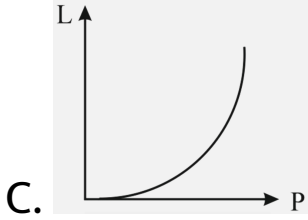
Answer: D

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30. If the excess pressure inside a soap bubble is balanced by oil column of height 2 mm , then the surface tension of soap solution will

be   (r   =   1   cm   and   density

$d = 0.8gcc^{-1}), g = 10ms^{-2}$

A. $4Nm^{-1}$

B. $4 \times 10^{-1}Nm^{-1}$

C. $4 \times 10^{-2}Nm^{-1}$

D. $4 \times 10^{-3}Nm^{-1}$

Answer: C

31. The elastic energy per unit volume is terms of longitudinal strain σ and Young's modulus Y is

A. $\dfrac{Y\sigma^2}{2}$

B. $\dfrac{Y\sigma}{2}$

C. $\dfrac{2Y\sigma^2}{2}$

D. $\dfrac{Y^2\sigma}{2}$

Answer: A

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32. 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

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33. A plano convex lens has focal length $f = 20cm$. If its plane surface is silvered, then new focal length will be

A. 20 cm

B. 40 cm

C. 30 cm

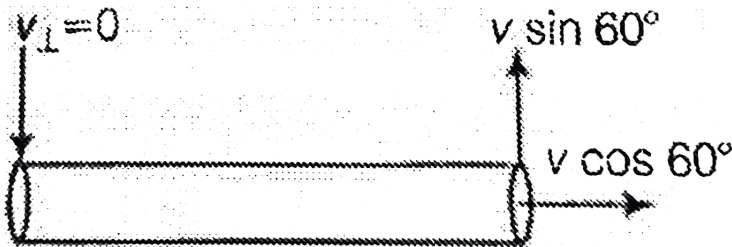D. 10 cm

Answer: C

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34. The instaneous velocity of point B of the given rod of length 0.5 is 3m/s in the represented direction. The angualr velocity of the rod for minimum velocity of end A is

A. $1.5 rads^{-1}$
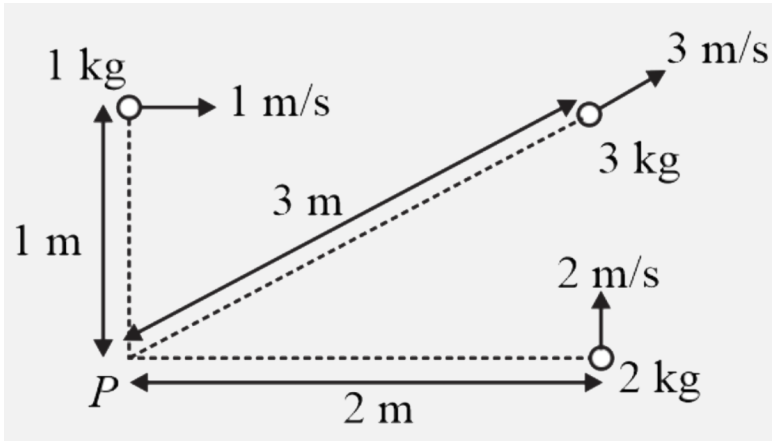
B. $5.2 rads^{-1}$

C. $2.5 rads^{-1}$

D. None of these

Answer: B

35. Three small balls of masses 1kg, 2kg and 3kg are moving in a plane and their velocities are $1ms^{-1}$, $2ms^{-2}$ and $3ms^{-1}$ respectively as shown . The total angular momentum of the system of three balls about point P at the

given instant of time is

A. $8 kgm^2 s^{-1}$

B. $9 kgm^2 s^{-1}$

C. $36 kgm^2 s^{-1}$

D. $7 kgm^2 s^{-1}$

Answer: D

36. In a full wave rectifier circuit operating

from $50Hz$ mains frequency , the fundamental

frequency in the ripple would be

A. 100 Hz

B. 70.7 Hz

C. 50 Hz

D. 25 Hz

Answer: A

37. In an n-p-n transistor circuit, the collector current ia 10 mA. If 90% of the electrons emitted reach the collector.

    A. The base current will be 1 mA

    B. The base current will be - 1 mA

    C. The emitter current will be 9 mA

    D. The emitter current will be 15 mA

Answer: A

38. The gases carbon-monoxide (CO) and nitrogen at the same temperature have kinetic energies E_1 and E_2 respectively. Then

A. $E_1 = E_2$

B. $E_1 > E_2$

C. $E_1 < E_2$

D. E_1 and E_2 cannot be compared

Answer: A

39. A current of 2.34 A flows in resistance of

11. 111111Ω The potential difference across

the given resistance with due regard for the

significant figure is

A. 26.000 A

B. 26.00 A

C. 26.0 V

D. 26 V

Answer: C

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40. In Young's double slit experiment, if the slit widths are in the ratio $1:9$, then the ratio of the intensity at minima to that at maxima will be

A. 1

B. $\dfrac{1}{9}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{3}$

Answer: C

41. In young's double slit experiment, distance between the slit S_1 and S_2 is d and the distance between slit and screen is D . Then longest wavelength that will be missing on the screen in front of S_1 is

A. $\dfrac{d^2}{D}$

B. $\dfrac{d^2}{2D}$

C. $\dfrac{D}{d^2}$

D. None of these

Answer: A

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42. Two periodic waves of intensities I_1 and I_2 pass through a region at the same time in the same direction. The sum of the maximum and minimum intensities is

A. $\left(\sqrt{I_1} - \sqrt{I_2}\right)^2$

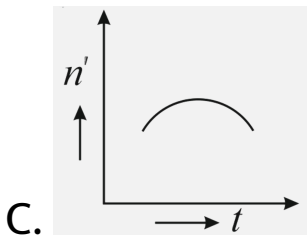B. $2(I_1 + I_2)$

C. $I_1 + I_2$

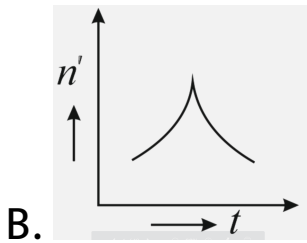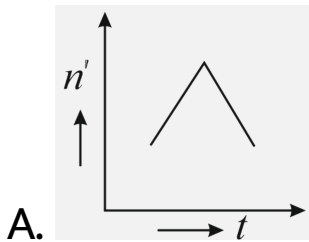D. $\left(\sqrt{I_1} + \sqrt{I_2}\right)^2$
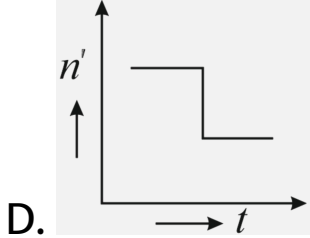
Answer: B

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43. A railway engine whistling at a constant frequency moves with a constant speed. It goes past a stationary observer standing

beside the railway track. The frequency (n) of

the sound heard by the observer is plotted

agains time (t). Which of the following best

represents the resulting curve?

A.

B.

C.

D.

Answer: D

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44. A particle moves along the X-axis from x=0 to x=5 m under the influence of a force given by $F = 7 - 2x + 3x^2$. Find the work done in the process.

A. 70 J

B. 270 J

C. 35 J

D. 135

Answer: D

45. A particle moves From a point $\left(-2\hat{i} + 5\hat{j}\right)$ to $\left(4\hat{j} + 3\hat{k}\right)$ When a force of

$\left(4\hat{i} + 3\hat{j}\right)$ N is applied . How much work has been done by the force ?

A. 8 J

B. 11 J

C. 5 J

D. 2 J

Answer: C