



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 96

Physics

1. A proton of mass m and charge $+e$ is moving in a circular orbit in a magnetic field with energy $1MeV$. What should be the

energy of alpha-particle (mass= $4m$ and charge= $+2e$), so that it can revolve in the path of same radius?

A. 1 Me V

B. 4 Me V

C. 2 Me V

D. 0.5 Me V

Answer: A



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2. Number of photons emitted by 100 W sodium lamp in one second is (Given $\lambda = 5.89 \times 10^{-9} m$, $h = 6.625 \times 10^{-34} Js$)

A. 2.9×10^{20}

B. 1.9×10^{18}

C. 2.9×10^{18}

D. 1.9×10^{20}

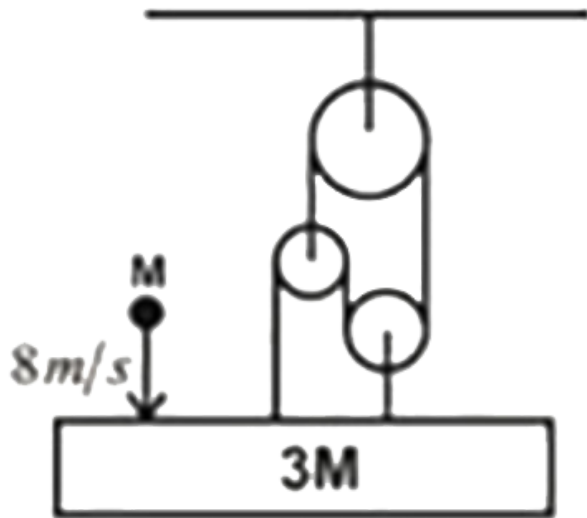
Answer: C



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3. The block of mass $3M$ is attached to the pulley system as shown in the figure. At $t = 0$, particle M falling vertically, strikes the block $3M$ with velocity 8 m s^{-1} and sticks to it. The speed of the combined mass just after the

collision is



A. $8ms^{-1}$

B. $10ms^{-1}$

C. $5ms^{-1}$

D. $2ms^{-1}$

Answer: D



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4. A charged particle (charge q) is moving in a circle of radius R with uniform speed v . The associated magnetic moment μ is given by

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

B. qvR^2

C. $\frac{qvR^2}{2}$

D. qvR

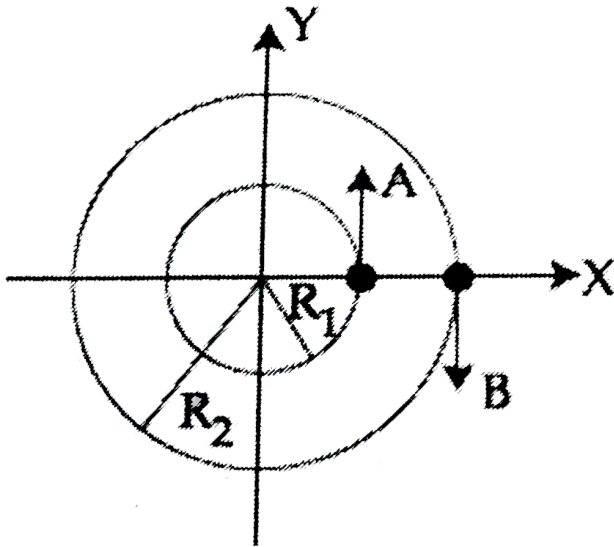
Answer: A



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5. Two particles A,B are moving on two concentric circles of radii R_1) and R_2 with equal angular speed ω . At $t = 0$, their positions and direction fo motion are shown in the

figure :



A. $-\omega(R_1 + R_2)\hat{i}$

B. $\omega(R_1 + R_2)\hat{i}$

C. $\omega(R_1 - R_2)\hat{i}$

D. $\omega(R_2 - R_1)\hat{i}$

Answer: D



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6. A wire is wound on a long rod of material of relative permeability $\mu_r = 4000$ to make a solenoid. If the current through the wire is $5A$ and number of turns per unit length is 1000 per metre, then the magnetic field inside the solenoid is:

A. $25.12mT$

B. $12.56mT$

C. $12.56T$

D. $25.12T$

Answer: D



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7. A cell can be balanced against $110cm$ and $100cm$ of potentiometer wire, respectively with and without being short circuited

through a resistance of 10Ω . Its internal resistance is

A. 1Ω

B. 0.5Ω

C. 2Ω

D. Zero

Answer: A



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8. How many percent of work done by a battery is consumed to fully charge a capacitor which is stored as electric potential energy in the capacitor ?

A. 25

B. 50

C. 70

D. 100

Answer: B



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9. The total flux (in S.I units) through a closed surface constructed around a positive charge of 0.5 C placed in a dielectric medium of dielectric constant 10 is

A. 5.65×10^9

B. 1.13×10^{11}

C. 9×10^9

D. 8.85×10^{-12}

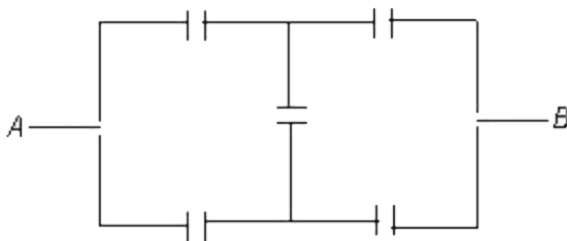
Answer: A



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10. Each capacitor shown in the figure is $2\mu F$.

Then the equivalent capacitance between points A and B is



A. $2\mu F$

B. $4\mu F$

C. $6\mu F$

D. $8\mu F$

Answer: A



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11. Two coils are at fixed location: When coil 1 has no current and the current in coil 2 increase at the rate of $15.0 A s^{-1}$, the emf in coil 1 is $25 mV$, when coil 2 has no current and

coil 1 has a current of 3.6 A , the flux linkage in coil 2 is

A. 16 mWb

B. 10 mWb

C. 4 mWb

D. 6 mWb

Answer: D



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12. A $100\text{W}200\text{V}$ bulb is connected to a 160V power supply. The power consumption would be

A. 125 W

B. 100 W

C. 80 W

D. 64 W

Answer: D



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13. At a distance 320 km above the surface of the earth , the value of acceleration due to gravity will be lower than its value on the surface of the earth by nearly (radius of earth = 6400 km)

A. 2 %

B. 6 %

C. 10 %

D. 14 %

Answer: C



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14. The rotation period of an earth satellite close to the surface of the earth is 83 minutes. The time period of another earth satellite in an orbit at a distance of three earth radii from its surface will be

A. 83 min

B. $83\sqrt{8}$ min

C. 664 min

D. 249 min

Answer: C



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15. Hot water cools from $60^{\circ}C$ to $50^{\circ}C$ in the first 10 min and to $42^{\circ}C$ in the next 10 min.

The temperature of the surrounding is

A. $20^{\circ}C$

B. $30^{\circ}C$

C. $15^{\circ}C$

D. $10^{\circ}C$

Answer: D



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16. A flask is filled with $13g$ of an ideal gas at $27^{\circ}C$ and its temperature is raised to $52^{\circ}C$.

The mass of the gas that has to be released to maintain the temperature of the gas in the

flask at 52°C , the pressure remaining the same is

A. 2.5 g

B. 2.0 g

C. 1.5 g

D. 1.0 g

Answer: D



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17. A Carnot's engine works between a source at a temperature of $27^{\circ}C$ and a sink at $-123^{\circ}C$. Its efficiency is

A. 0.5

B. 0.25

C. 0.75

D. 0.4

Answer: A



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18. A long hollow copper tube carries a current

I. Then, which of the following will be true ?

A. The magnetic field B will be zero at all

points inside the tube

B. The magnetic field B will be zero only at

points on the axis of the tube

C. The magnetic field B will be maximum at

points on the axis of the tube

D. The magnetic field will be zero at any point outside the tube

Answer: D



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19. If in circular coil of radius R , current I is flowing and in another coil B of radius $2R$ a current $2I$ is flowing , then the raatio of the magnetic fields B_A and B_B , produced by them will be

A. 1

B. 2

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

D. 4

Answer: A



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20. A stone is thrown vertically upwards. When stone is at a height half of its maximum height, its speed is $10ms^{-1}$, then the

maximum height attained by the stone is (

$$g = 10\text{ms}^{-2})$$

A. 8 m

B. 10 m

C. 15 m

D. 20 m

Answer: B



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21. A particle moves in a straight line with a constant acceleration. It changes its velocity from 10ms^{-1} to 20ms^{-1} while passing through a distance 135m in t seconds. The value of t is.

A. 10

B. 1.8

C. 12

D. 9

Answer: D



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22. A body of mass 4 kg is accelerated up by a constant force, travels a distance of 5 m in the first second and a distance of 2m in the third second. The force acting on the body is

A. 2 N

B. 4 N

C. 6 N

D. 8 N

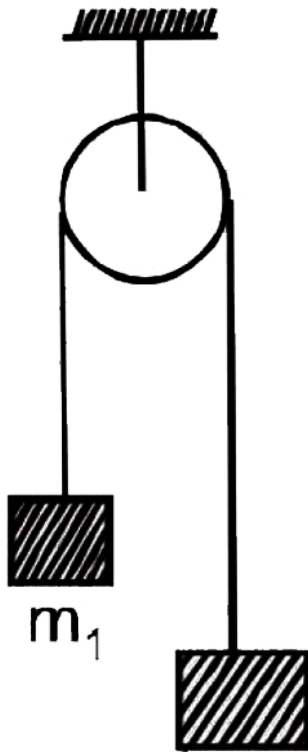
Answer: C



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23. Two masses $m_1 = 5kg$ and $m_2 = 4.8kg$ tied to a string are hanging over a light frictionless pulley. What is the acceleration of

the masses when left free to move?



A. $0.2ms^{-2}$

B. $9.8ms^{-2}$

C. $5ms^{-2}$

D. $4.8ms^{-2}$

Answer: A



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24. Two nuclei have mass number in the ratio 1:8. What is the ratio of their nuclear radii?

A. 3 : 1

B. 1 : 3

C. 1 : 2

D. 2: 1

Answer: C



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25. If the binding energy per nucleon in ${}_{3}\text{Li}^7$ and ${}_{2}\text{He}^4$ nuclei are respectively 5.60 MeV and 7.06 MeV, then the energy of proton in the reaction ${}_{3}\text{Li}^7 + p \rightarrow 2{}_{2}\text{He}^4$ is

A. 19.6 MeV

B. 2.4 MeV

C. 8.4 MeV

D. 17.3 MeV

Answer: D



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26. A particle moves on the X-axis according to the equation $x = x_0 \sin^2 \omega t$. The motion is simple harmonic

A. with amplitude x_0

B. with amplitude $2x_0$

C. with time period $\left(\frac{2\pi}{\omega}\right)$

D. with time period $\left(\frac{\pi}{\omega}\right)$

Answer: D



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27. This time period of a particle undergoing SHM is 16 s. It starts motion from the mean

position. After 2 s, its velocity is 0.4 m s^{-1} . The amplitude is

A. 1.44 m

B. 0.72 m

C. 2.88 m

D. 0.36 m

Answer: A



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28. How many photons are emitted by a laser source of 5×10^{-3} W operating at 632.2 nm in 2 second ($h = 6.63 \times 10^{-34}$ Js)?

A. 3.2×10^{16}

B. 1.6×10^{16}

C. 4×10^{16}

D. None of these

Answer: A



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29. Light of energy 2.0 eV falls on a metal of work function 1.4 eV . The stopping potential is

A. 0.6 V

B. 2.0 V

C. 3.4 V

D. 1.4 V

Answer: A



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30. The neck and bottom of a bottle are 3 cm and 15 cm in radius respectively. If the cork is pressed with a force 12 N in the neck of the bottle, then force exerted on the bottom of the bottle is :-

A. 30 N

B. 150 N

C. 300 N

D. 600 N

Answer: C





31. Two spherical soap bubbles of radii r_1 and r_2 in vacuume coalesce under isothermal condition. The resulting bubble has radius R such that

A. $\frac{r_1 + r_2}{2}$

B. $\frac{r_1 r_2}{r_1 + r_2}$

C. $\sqrt{r_1 r_2}$

D. $\sqrt{r_1^2 + r_2^2}$

Answer: D



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32. A converging lens has a focal length of 0.12 m. To get an image of unit magnification the object should be placed at what distance from the converging lens ?

A. 0.24 m

B. 0.12 m

C. 0.06 m

D. 0.4 m

Answer: A



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33. An illuminated object and a screen are placed 90cm apart. What is the focal length and nature of the lens required to produce a clear image on the screen twice the size of the object ?

A. 10 cm

B. 20 cm

C. 15 cm

D. 30 cm

Answer: B



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34. A solid cylinder of mass M and radius R rolls without slipping on a flat horizontal surface. Its moment of inertia about the line of contact is MR^2 ?

A. $\left(\frac{3}{2}\right)MR^2$

B. MR^2

C. $2MR^2$

D. $\left(\frac{2}{3}\right)MR^2$

Answer: A



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35. Two wheels A and B are mounted on the same axle. Moment of inertia of A is $6 \text{ kg } m^2$ and is rotated at 600 rpm, when B is at rest.

What will be moment of inertia of B, if their combined speed is 400 rpm?

A. 8 kg m^2

B. 4 kg m^2

C. 3 kg m^2

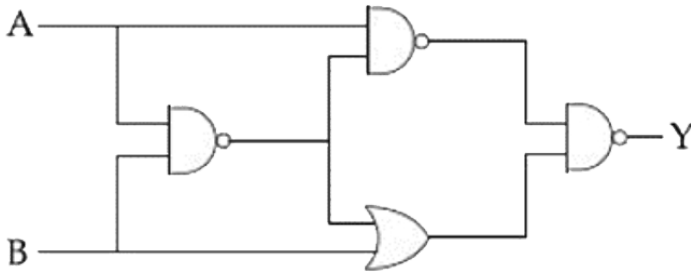
D. 5 kg m^2

Answer: C



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36. The output of the given logic circuit is :



A. $A\bar{B}$

B. $\bar{A}B$

C. $AB + \overline{AB}$

D. $A\bar{B} + \bar{A}B$

Answer: A



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37. In a pure silicon ($n_i = 10^{16} / m^3$) crystal at $300K$, 10^{21} atoms of phosphorus are added per cubic meter. The new hole concentration will be

A. 10^{21} per m^3

B. 10^{19} per m^3

C. 10^{11} per m^3

D. 10^5 per m^3

Answer: C



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38. The temperature of a gas contained in a closed vessel increases by $1^{\circ}C$ when pressure of the gas is increased by 1% . The initial temperature of the gas is

A. 100 K

B. $273^{\circ}C$

C. $100^{\circ}C$

D. $200K$

Answer: A



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39. The dimensional formula of magnetic induction B is

A. $[M^0 ALT^0]$

B. $[M^0 AL^{-1}T^0]$

C. $[M^0 AL^2T^0]$

D. $[M^0 A^{-1} T^{-2}]$

Answer: D



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40. In Yonung's double-slit experiment, two slits which are separated by 1.2 mm are illuminated with a monochromatic light of wavelength 6000\AA . The interference pattern is observed on a screen placed at a distance of 1

m from the slits. Find the number of bright fringes formed over 1 cm width on the screen.

A. 25

B. 12

C. 15

D. 20

Answer: D



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41. A thin mica sheet of thickness $2 \times 10^{-6}m$ and refractive index ($\mu = 1.5$) is introduced in the path of the first wave. The wavelength of the wave used is 5000\AA . The central bright maximum will shift

A. 1

B. 2

C. 5

D. 10

Answer: B



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42. A source of sound S is moving with a velocity of 50m/s towards a stationary observer. The observer measures the frequency of the source as 1000 Hz . What will be the apparent frequency of the source as 1000 Hz . What will be the apparent frequency of the source when it is moving away from the observer after crossing him? The velocity of the sound in the medium is 350m/s

A. 750 Hz

B. 857 Hz

C. 1143 Hz

D. 1333 Hz

Answer: A



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43. Two waves represented by

$$y = a \sin(\omega t - kx) \quad \text{and} \quad y = a \cos(\omega t - kx)$$

are superposed. The resultant wave will have an amplitude.

A. a

B. $\sqrt{2a}$

C. $2a$

D. zero

Answer: B



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44. A spring of spring constant $5 \times 10^3 \text{ N/m}$ is stretched initially by 5 cm from the unstretched position. The work required to further stretch the spring by another 5 cm is .

A. 12.50 N m

B. 18.75 N m

C. 25 N m

D. 6.25 Nm

Answer: B



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45. A person holds a bucket of weight 60N . He walks 7m along the horizontal path and then climbs up a vertical distance of 5m . The work done by the man is

A. 300 J

B. 420 J

C. 720 J

D. None of these

Answer: A



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