PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 75

Physics

1. The age of the wood if only $1/16$ part of original C^{14} is present in its piece is (in years) (T of C^{14} is $5,580$ years)

A. 5580 years

B. 11160 years

C. 22320 years

D. 16740 years

Answer: C

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2. The wavelength involved in the spectrum of deuterium $_{}(1)^2D$ are slightly different from that of hydrogen spectrum because

A. Sizes of the two nuclei are different

B. Nuclear forces are different in the two cases

C. masses of the two nuclei are different

D. Attraction between the electron and the nucleus is different in the two cases

Answer: C

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3. A bomb of mass $30kg$ at rest explodes into two pieces of mass $18kg$ and $12kg$. The velocity of mass $18kgis6m/s$. 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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4. A machine gun fires a bullet of mass 40 g with a velocity $1200ms^{-1}$. The man holding it can exert a maximum force of 144 N on the gun. How many bullets can be fire per second at the most?

A. one

B. Four

C. Three

D. Two

Answer: C

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5. A simple pendulum is oscillating without damping. When the displacement of the bob is less then maximum, its acceleration vector $\vec{a}$ is correctly shown in :

A. 

B. 

C. 

D. 

Answer: C

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6. A particle P is moving in a circle of radius r with a uniform speed v. C is the centre of the circle and AB is the diameter. The angular velocity of P about A and C Is in ratio

A. $1:1$

B. $1:2$

C. $2:1$

D. $4:1$

Answer: B

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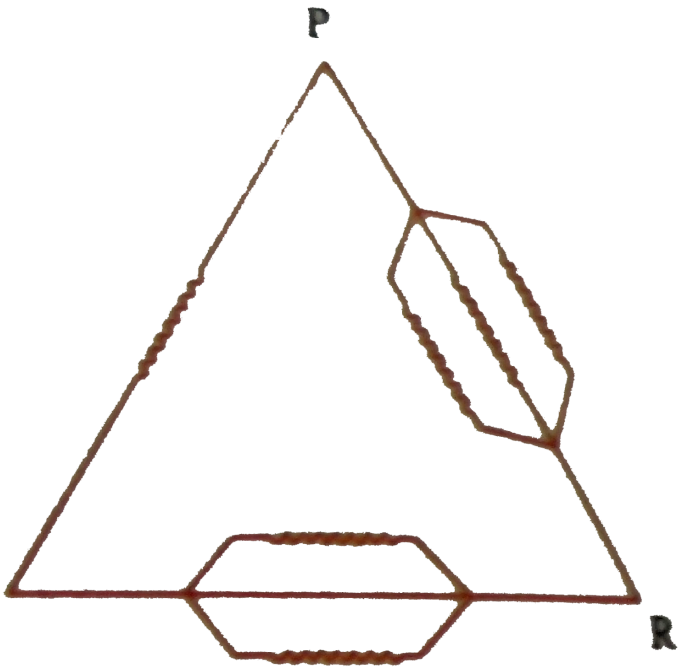
7.



Six equal resistances are connected between points P, Q and R as shown in the figure. Then the net resistance will be maximum between

A. P and Q

B. Q and R

C. P and R

D. Any two points

Answer: A

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8. A galvanometer of resistance 22.8Ω measures 1 A. How much shut should be used , so that it can be used to measure 20 A ?

A. 1Ω

B. 2Ω

C. 1.2Ω

D. 2.2Ω

Answer: C

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9. The ratio of the magnetic field at the centre of a current-carrying circular coil to its magnetic moment is x. If the current and

radius each of them are made three times, the new ratio will become

A. 3x

B. 9x

C. $\frac{x}{9}$

D. $\frac{x}{27}$

Answer: D

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10. In an LCR circuit, the capacitance is made one-fourth, when in resonance. Then what should be the change in inductance, so that the circuit remains in resonance?

A. 4 times

B. $\frac{1}{4}$ times

C. 8 time

D. 2 times

Answer: A

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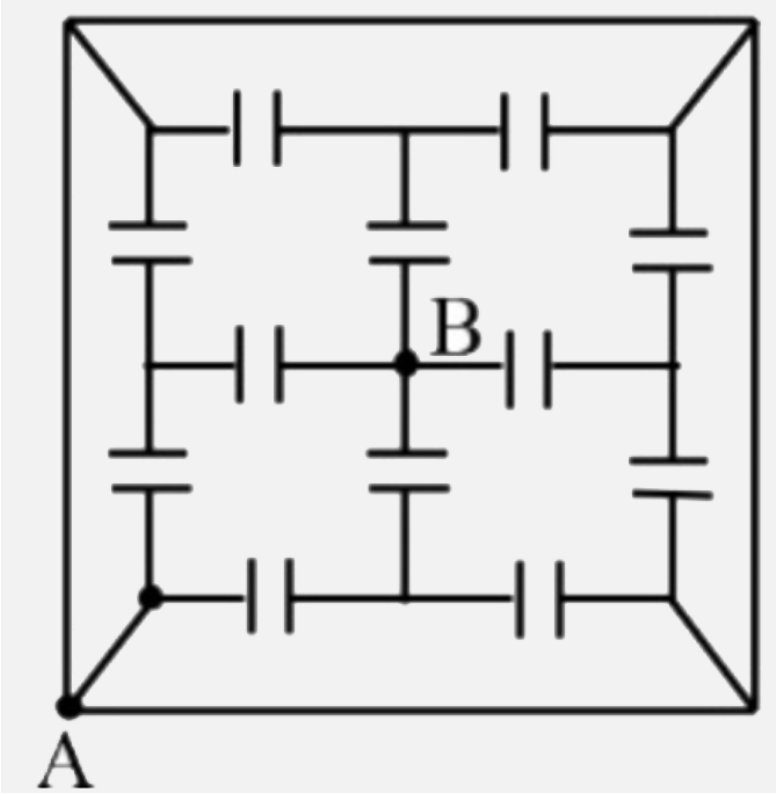
11. If each capacity has capacitance C , then equivalent capacitance between A and B is



A. $\frac{4C}{3}$

B. $\frac{8C}{3}$

C. $12C$

D. $\frac{5C}{12}$

Answer: B

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12. A uniform electric field poiting in poistive x-direction exists in a region. Let A be the origin, B be the point on the x-axis at $x = +1cm$ and C be the point on the y-axis at

$y = +1cm$. Then the potentials at the points

A, B and C satisfy:

A. $V_A < V_B$

B. $V_A > V_B$

C. $V_A > V_C$

D. $V_A < V_C$

Answer: B

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13. The semi -major axis of the orbit of Saturn is approximately nine time of earth. the time period of revolution of Saturn is approximately equal to

A. 81 years

B. 27 years

C. 729 years

D. 9 years

Answer: B

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14. A spring balance and a physical balance are kept in a lift. In these balance equal masses are placed. If now the lift starts moving upward with constant acceleration, then.

A. Readings of A and B will be different at both the places

B. Readings of A will be different but those of B will be same at both the places

C. Readings of A will be same but those of B will be different at both the places

D. Readings of both A and B are same at both the places

Answer: B

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15. When an ideal diatomic gas is heated at constant pressure, the fraction of the heat

energy supplied which increases the internal energy of the gas is

A. $\frac{2}{5}$

B. $\frac{3}{5}$

C. $\frac{3}{7}$

D. $\frac{5}{7}$

Answer: D

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16. Certain amount of an ideal gas is contained in a closed vessel. The vessel is moving with a constant velcity v. The molecular mass of gas is M. The rise in temperature of the gas when the vessel is suddenly stopped is $(\gamma C_P / C_V)$

A. $\frac{Mv^2(\gamma - 1)}{2R(\gamma + 1)}$

B. $\frac{Mv^2(\gamma - 1)}{2R}$

C. $\frac{Mv^2}{2R(\gamma + 1)}$

D. $\frac{Mv^2}{2R(\gamma - 1)}$

Answer: B

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17. An ideal gas heat engine operates in Carnot cycle between $227^\circ C$ and $127^\circ C$. It absorbs $6.0 \times 10^4 cal$ of heat at high temperature. Amount of heat converted to work is :

A. 2000 J

B. 4000 J

C. 8000 J

D. 5600 J

Answer: A

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18. A coil in the shape of an equilateral triangle of side l is suspended between the pole pieces of a permanent magnet such that $\vec{B}$ is in the plane of the coil. If due to a current i in the triangle a torque τ acts on it, the side l of the triangle is

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

B. $\frac{2}{\sqrt{3}}\left(\frac{\tau}{BI}\right)$

C. $2\left(\frac{\tau}{BI}\right)^{\frac{1}{2}}$

D. $\frac{1}{\sqrt{3}}\frac{\tau}{BI}$

Answer: A

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19. The magnetic field B due to a current-carrying circular loop of radius 12cm at its center is $0.50 \times \left(10^{-4}\right)T$. Find the magnetic

field due to this loop at a point on the axis at a distance of 5.0 cm from the centre.

A. $3.9 \times 10^{-5} T$

B. $5.2 \times 10^{-5} T$

C. $2.1 \times 10^{-5} T$

D. $9 \times 10^{-5} T$

Answer: A

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20. The magnetic moment of electron due to orbital motion is proportional to

(n= principle quantum numbers)

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

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

C. n^2

D. n

Answer: D

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21. Two trains A and B of length 400 m each are moving on two parallel tracks with a uniform speed of $72kmh^{-1}$ in the same direction, with A ahead of B. The driver of B decides to overtake A and accelerates by $1ms^{-2}$. If after $50s$, the guard of B just brushes past the driver of A, what was the original distance between them?

A. 1000 m

B. 1150 m

C. 1300 m

D. 1250 m

Answer: D

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22. A boy playing on the roof of a $10m$ high building throws a ball with a speed of $10m/s^{-1}$ at an angle of 30° with the horizontal. How far from the throwing point will the ball be at a height of $10m$ from the ground?

A. 5. 20 m

B. 4 . 33 m

C. $2.60m$

D. 8 . 66 m

Answer: D

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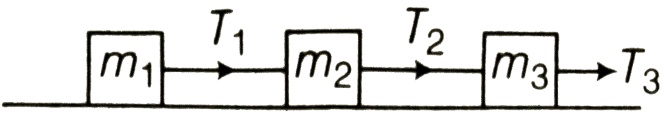
23. Three blocks of masses m_1, m_2 and m_3 are connected by mass less string as shown kept on a frictionless table.



They are pulled with a force $T_3 = 40N$. If $m_1 = 10kg, m_2 = 6kg$ and $m_3 = 4kg$, the tension T_2 will be

A. 10 N

B. 20 N

C. 32 N

D. 40 N

Answer: B

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24. A mass 1 kg is suspended by a thread. It is

(i) lifted up with an acceleration $4.9m/s^2$

(ii) lowered with an acceleration $4.9m/s^2$.

The ratio of the tensions is

A. $3:1$

B. $1:2$

C. $1:3$

D. $2:1$

Answer: A

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25. Using the following data .Mass hydrogen atom = 1.00783 u Mass of neutron = 1.00867 u Mass of nitrogen atom $\left(._7 N^{14}\right)$ 14.00307 u The calculated value of the binding energy of the nucleus of the nitrogen atom $\left(._7 N^{14}\right)$ is close to

A. 56 MeV

B. 98 MeV

C. 104 MeV

D. 112 MeV

Answer: C

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26. $.^{65}Cu$ will turn into $.^{66}Cu$ if it is bombarded will

A. Protons

B. Neutrons

C. Electrons

D. Alpha particles

Answer: B

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27. If a simple pendulum oscillates with an amplitude of 50 mm and time period of 2 sec, then its maximum velocity is

A. $0.10ms^{-1}$

B. $0.15ms^{-1}$

C. $0.8ms^{-1}$

D. $0.26ms^{-1}$

Answer: B

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28. The frequency of an open organ pipe is n. If one of its ends is closed then its fundamental frequency will be –

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

B. 2n

C. n

D. 3n

Answer: A

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29. Calculate de Broglie wavelength associated with an electron, accelerated through a potential difference of $400V$.

A. 0.03 nm

B. 0.04 nm

C. 0.12 nm

D. 0.06 nm

Answer: D

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30. In photoelectric emission process from a metal of work function $1.8eV$, the kinetic

energy of most energetic electrons is $0.5eV$.

The corresponding stopping potential is

A. 1.8 V

B. 1.3 V

C. 0.5 V

D. 2.3 V

Answer: C

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31. Two mercury drops (each of radius r) merge to form a bigger drop. The surface energy of the bigger drop, if T is the surface tension is

A. $2^{\frac{5}{3}}\pi r^2 T$

B. $4\pi^2 T$

C. $2\pi r^2 T$

D. $2^{\frac{8}{3}}\pi r^2 T$

Answer: D

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32. A U-shaped wire is dipped in a soap solution, and removed. A thin soap film formed between the wire and a light slider supports a weight of $1.5 \times 10^{-2} N$ (which includes the small weigh of the slider). The length of the slider is 30cm. What is the surface tension of the film?

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

B. $2 \times 10^{-5} Nm^{-1}$

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

D. $2.5 \times 10^{-2} Nm^{-1}$

Answer: D

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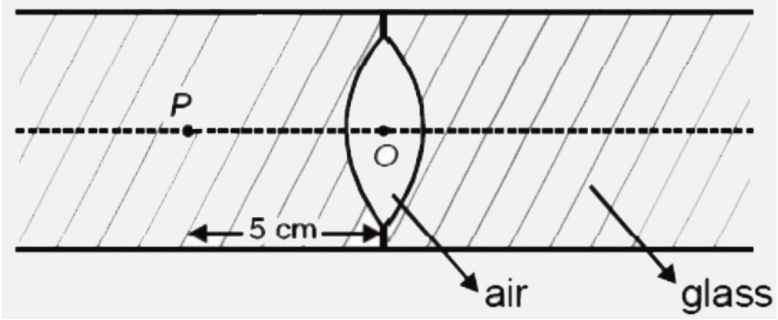
33. Consider the show glass slab having a thin biconvex cavity of air centred at O. A black spot at P will have image ($\mu_{\text{glass}} = \frac{3}{2}$,the radius of

curvature of each surface of the cavity = 10 cm)



A. 7.5 cm on the right side of O

B. 7.5 cm on the left side of O

C. 3.75 cm on the right side of O

D. 3.75 cm on the left side of O

Answer: D

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34. A ray of light is incident on a surface of glass slab at an angle 45°. If the lateral shift produced per unit thickness is $1/\sqrt{3}$, the angle of refraction produced is

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

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

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

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

Answer: B

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35. A thin horizontal circular disc is roating about a vertical axis passing through its centre. An insect is at rest at a point near the rim of the disc. The insect now moves along a diameter of the disc to reach its other end. During the journey of the insect, the angular speed of the disc.

A. Continuously decreases

B. Continuously increases

C. first increases and then decreases

D. Remains unchanged

Answer: C

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36. The average value of rotational kinetic energy of one mole of oxygen gas at temperature T will be

A. RT

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

C. $\frac{5}{2}$ RT

D. $\frac{1}{2}$ RT

Answer: A

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37. In a common emitter transistor amplifier, $\beta = 60, R_0 = 5000\Omega$ and internal resistance of a transistor is 500Ω. The voltage amplification of the amplifier will be

A. 500

B. 460

C. 600

D. 560

Answer: C

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38. Currents flowing in each of the following circuits A and B respectively are

A. 1A, 2A

B. 2A , 1A

C. 4A , 2A

D. 2A , 4A

Answer: C

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39. A brass wire 2 m long at $27^{\circ} C$ is held taut with negligible tension between two rigid supports. If the wire is cooled to a

temperature of $-33^{\circ}C$, then the tension developed in the wire, its diameter being 2 mm, will be (coefficient of linear expansion of brass $= 2.0 \times 10^{-5}/^{\circ}C$ and Young's modulus of brass $= 0.91 \times 10^{11} Pa$)

A. 3400 N

B. 34 kN

C. 0.34 kN

D. 6800 N

Answer: C

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40. Identify the pair whose dimensions are equal

A. torque and work

B. stress and energy

C. force and stress

D. force and work

Answer: A

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41. In a system of two polarisers , it is found that the intensity of light from the second polarized is half from that of the first polariser .The angle between their pass axes is

A. 60°

B. 30°

C. 0°

D. 45°

Answer: D

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42. A two slit Young's interference experiment it done with monochromatic light of wavelength $6000A$. The slits are $2mm$ apart. The fringes are observed on a screen placed $10cm$ away from the slits. Now a transparent plate of thickness $0.5mm$ is placed in front of one of the slits and it if found that the interference pattern shifts by $5mm$. The refractive index of the transparent plate is :

A. 1.2

B. 1.5

C. 1.8

D. $4/3$

Answer: A

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43. A closed organ pipe and an open organ pipe have their first overtones identical in frequency . Their lenghts are in the ratio

A. $1:2$

B. $2:3$

C. $3:4$

D. $4.\ :5$

Answer: C

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44. A progressive wave is represented by $y = 12\sin(5t - 4x)$ cm. On this wave, how far

away are the two points having phase difference of 90° ?

A. $\frac{\pi}{2}$ cm

B. $\frac{\pi}{4}$ cm

C. $\frac{\pi}{8}$ cm

D. $\frac{\pi}{16}$ cm

Answer: C

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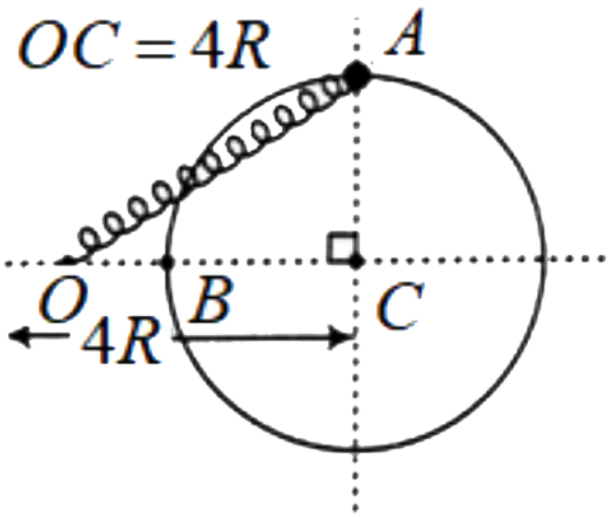
45. A bead of mass m can slide without friction on a fixed circular horizontal ring of radius 3R having a centre at the point C. The bead is attached to one of the ends of spring of spring constant k. Natural length of spring is R and the other end of the spring is R and the other end of the spring is fixed at point O as shown in the figure. If the bead is released from position A, then the kinetic energy of the

bead when it reaches point B is



A. $\frac{25}{2}kR^2$

B. $\frac{9}{2}kR^2$

C. $8kR^2$

D. $12kR^2$

Answer: C

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