

India's Number 1 Education App

PHYSICS

NTA MOCK TESTS ENGLISH

NTA NEET SET 74



1. Tritium with a half-life of 12.5 years undergoing beta decay. What fraction of a

sample of pure tritium will remain undecayed

after 25 years.

A. One half

B. One fourth

C. One third

D. Three fourth

Answer: B

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2. As an electron makes a transition from an excited state to the ground state of a hydrogen - like atom/ion :

A. Kinetic energy decrease , potential energy increase but total energy remains same

B. Kinetic energy and total energy decrease

but potential energy increases

C. Its kinetic energy increase but potential

energy and total decrease

D. Kinetic energy , potential energy and

total energy decrease

Answer: C



3. A curved road of diameter $1 \cdot 8$ km is banked so that no friction is required at a speed of 30 ms^{-1} . What is the banking angle ?

A. $\tan^{-1}(0.1)$

 $B. \tan^{-1}(0.3)$

$$C. \tan^{-1}(0.9)$$

D. $\tan^{-1}(1.5)$

Answer: A

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4. The linear momentum of a particle varies with time t as $p = a + bt + ct^2$. Then, whichh of the following is correct?

| A. Force varies with time in a quadratic |
|--|
| manner |
| B. Force is time - dependent |
| C. The velocity of the particle is |
| proportional to time |
| D. The displacement of the particle is |
| proportional to time . |
| |
| Answer: B |

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5. Two buses A and B are moving around concentric circular pathe of radii r_A and r_B If the two buses complete the circular paths in the sme time. The ratio on their linear speeds is

A. 1

B.
$$rac{r_A}{r_B}$$

C. $rac{r_B}{r_A}$

D. None of these

Answer: B

6. A flywheel rotates about a fixed axis and slows down from 300 rpm to 100 rpm in 2 minutes (i) What is the angular acceleration in rad min^{-2} ? (ii) How many revolutions does the wheel complete during this time ?

A.
$$\frac{100}{\pi}$$

B. 100

$\mathsf{C}.\,100\pi$

D. 200π

Answer: D

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7. A silver wire has a temperature coefficient of resistivity 4×10^{-3} . $^{\circ} C^{-1}$ and its resistance at $20^{\circ}C$ is 10Ω Neglecting any change in dimensions due to the change in temperature , its resistance at $40^{\circ}C$ is $\mathsf{B}.\,1.8\Omega$

 $\mathsf{C}.\,10.8\Omega$

D. 11.6Ω

Answer: C

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8. The resistance of metal sheet 1 between the shaded portion is R_1 and Resistance between

shaded portion for sheet 2 R_2 the $R_1 \, / \, R_2$ is



A. 1

B. 1/2

C. 2

D. 4

Answer: A





9. A circular disc of radius 0.2m is placed in a uniform magnetic fied of induction $\frac{1}{\pi} \left(\frac{Wb}{m^2} \right)$ in such a way that its axis makes an angle of 60° with *B*. The magnetic flux linked with the disc is

A. 0.08 Wb

B. 0.01 Wb

C. 0.02 Wb

D. 0.06 Wb

Answer: C



10. In an AC circuit, the instantaneous values of emf and current are $E = 200 \sin(300t)V$ and $I = 2 \sin\left(300t + \frac{\pi}{3}\right)A$ respectively. The average power consumed (in watt) is

A. 200

B. 100

D. 400

Answer: B

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11. A charge Q is distributed over two concentric conducting thin spherical shells radii r and R (R > 1). If the surface charge densities on the two shells are equal, the

electric potential at the common centre is:



A.
$$rac{kQ(R+r)}{Rr}$$

B. $rac{kQ(R+r)}{R^2+r^2}$
C. $rac{kQ}{\sqrt{R^2}+r^2}$
D. $kQigg(rac{1}{R}-rac{1}{r}igg)$

Answer: B



12. Two identical capacitors have the same capacitance C. one of them is charged to potential V_1 and the other to V_2 . The negative ends of the capacitors are connected together. What the positive eneds are also connected, the decrease in neergy of the combine system is

A.
$$rac{C}{4} \left(V_1^2 - V_2^2
ight)$$

B. $rac{C}{4} \left(V_1^2 + V_2^2
ight)$
C. $rac{C}{4} \left(V_1 - V_2
ight)^2$
D. $rac{C}{4} \left(V_1 + V_2
ight)^2$

Answer: C



13. A body of mass m is placed on the earth's surface . It is taken from the earth's surface to a height h = 3 R where R is the radius of the

earth. The change in gravitational potential

energy of the body is

A.
$$\frac{3}{2}mgR$$

B. $\frac{3}{4}mgR$
C. $\frac{1}{2}mgR$
D. $\frac{1}{4}mgR$

Answer: B

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14. Two planets A and B have the same average density. Their radii R_A and R_B are such that $R_A: R_B = 3:1$. If g_A and g_B are the acceleration due to gravity at the surface of the planets, the $g_A: g_B$ equals

A. 3: 1 B. 1: 3 C. 1: 9 D. $\sqrt{3}$: 1

Answer: A



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15.

Three rods of the same dimension have thermal conductivity 3K , 2K and K. They are arranged as shown in the figure below Then , the temperature of the junction in steady-state is



Answer: A

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16. A gas expands with temperature according to the relation $V = KT^{\frac{2}{3}}$. Work done when the temperature changes by 60K is. A. 10R

B. 30R

C. 40R

D. 20R

Answer: C

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17. An ideal gas is taken through the cycle A o B o C o A as shown in the figure. If the net heat supplied to the gas in the cycle is

5 J , the work done by the gas in the process C o A is



A.
$$-5J$$

- $\mathsf{B.}-10J$
- $\mathsf{C.}-15J$

 $\mathrm{D.}-20J$

Answer: A



18. One mole of an ideal monatomic gas at temperature T_0 ecpands slowly according to the law $\frac{P}{V}$ = constant. If the final temperature is $2T_0$, heat supplied to the gas is

A. $2RT_0$

B. RT_0

C.
$$rac{3}{2}RT_0$$

D. $\frac{1}{2}RT_0$

Answer: A

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19. H^+ , He^+ and O^{2+} ions having same kinetic energy pass through a region of space filled with uniform magnetic field B directed perpendicular to the velocity of ions. The masses of the ions H^+, He^+ and O^{2+} are respectively, in the ratio 1:4:16. As a result

- A. H^+ will be least deflected .
- B. H^+ and O^{+2} will be deflected equally.
- C. O^{+2} will be deflected most.
- D. All will be deflected equally.

Answer: B



20. A bar mangnet has length 3 cm cross sectional area 2 cm^2 and magnetic moment 3 Am^2 the intensity of magnetisation of the bar magnet is

A.
$$2 imes 10^5 Am^{-1}$$

- B. $3 imes 10^5 Am^{-1}$
- C. $4 imes 10^5 Am^{-1}$
- D. $5 imes 10^5 Am^{-1}$

Answer: D



21. A particle shows distance-time curve as given in this figure. The maximum instantaneous velocity of the particle is around the point.



(a) B (b) C (c) D (d) A

A. D

B.A

С. В

D. C

Answer: D



22. A bomb is dropped from an aeroplane flying horizontally with a velocity $469ms^{-1}$ at

an altitude of 980 m . The bomb will hit the ground after a time (use $g=9.8ms^{-2}$)

A. 2 s

B. $\sqrt{2}s$

C. $5\sqrt{2}s$

D. $10\sqrt{2}s$

Answer: D



23. A block of mass kg lies on a horizontal surface in a truck· The coefficient of stalk friction between the block and the surface is 0.6. If the acceleration of the truck is $5ms^{-2}$. The frictional force acting on the block is

A. 5N

B. 2.5 N

C. 5.88 N

D. 9.8 N

Answer: A

24. Two masses A and B of 10kg and 5kg, respectively , are connected with a string passing over a frictionless pulley fixed at the corner of a table as shown. The coefficient of static friction between A and the table is 0.2. The minimum mass C that should be placed

on A to prevent it from moving is equal to



A. 15 kg

B. 5 kg

C. 10 kg

D. 0 kg

Answer: A



25. A sample contains large number of nuclei. The probability that a nucleus in sample will decay after four half lives is

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

B. $\frac{3}{4}$
C. $\frac{15}{16}$
D. $\frac{7}{16}$

Answer: C



26. A 0.2mL sample of a solution containing 1.0×10^{-7} curie of $._1^3 H$ is injected to the blood stream of an animal. After sufficient time for circulatory equilibrium to be established, 0.10mL of blood is found to have an activity of 20dpm. Calculate the volume of blood in animal, assuming no change in

equilibrium.

A. 11110 mL

B. 1110 mL

C. 11010 mL

D. 10110 mL

Answer: B

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27. Two springs with negligible massess and force constant of $k_1=200Nm^{-1}$ and $k_2 = 160 Nm^{-1}$ are attached to the block of mass m = 10kg as shown in the figure. Initially the block is at rest at the equilibrium position the block is at rest at the equilibrium position ir. Which both springs are neither stretched nor compressed. At time t = 0, sharp impulse of 50 N-s is given to the block in horizontal

direction.



A. Period of oscillations for the mass m is

 $\frac{\pi}{6}$ s

B. Maximum velocity of the mass m during

its oscillation is $10ms^{-1}$

C. Data are insufficient to determine

maximum velocity

D. Amplitude of oscillation is 0.83 m

Answer: D



28. Light of two different frequencies whose photons have energies 1ev and 2.5eV whose work frequency is 0.5eV successively, Ratio of maximum speeds of emitted electrons will be

A. 1:4

B. 1:2

C. 1:1

D. 1:5

Answer: B

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29. The de-Broglie wavelength of neutron in thermal equilibrium at temperature T is

A.
$$\frac{30.8}{\sqrt{T}}$$
Å
B.
$$\frac{0.308}{T}$$
Å
C.
$$\frac{0.025}{\sqrt{T}}$$
Å

D. $\frac{0.25}{\sqrt{7}}$ Å

Answer: A

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30. A rain drop of radius 0.3 mm has a terminal velocity I air 1 ms^{-1} . The viscosity of air is 18×10^{-5} poise. Find the viscous force on the rain drops.

A. $101.73 imes 10^{-4}$ dyne

B. $101.73 imes 10^5$ dyne

C. $16.95 imes 10^{-4}$ dyne

D. $16.95 imes10^{-5}$ dyne

Answer: A

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31. Two metal wires P and Q of same length and material are stretched by same load. Yheir masses are in the ratio $m_1: m_2$. The ratio of elongation of wire P to that of Q is A. m_1^2 : m_2^2

B. m_2^2 : m_1^2

C. $m_2: m_1$

D. $m_1: m_2$

Answer: C



32. The distance between an object and the screen is 100cm. A lens produces an image on the screen when the lens is placed at either of

the positions 40cm apart. The power of the

lens is nearly

A. 3 D

B. 5 D

C. 7 D

D. 9 D

Answer: B



33. A biconvex lens of focal length f forms a circular image of radius r of sun is focal plane. Then, which option is correct?

A.
$$\pi r^2 \propto f$$

B.
$$\pi r^2 \propto f^2$$

C. If lower half part is covered by black

sheet, then area of the image is equal to

$$rac{\pi r^2}{2}$$

D. If f is doubled , intensity will increase

Answer: B



34. A rigid body is made of three identical thin rods, each with length fastened together in the form. of letter H. The body is free to rotate about a horizontal axis that runs along the length of one of the arms of H. The body is allowed to fall from rest from a position in which the plane of the H is horizontal. What is the angular speed of the body when the plane

of H is vertical?



A.
$$\sqrt{\frac{g}{L}}$$

B. $\frac{1}{2}\sqrt{\frac{g}{L}}$
C. $\frac{3}{2}\sqrt{\frac{g}{L}}$
D. $2\sqrt{\frac{g}{L}}$





35. The coefficient of friction between the two two blocks is 0.3 where as the surface AB is smooth



A. Friction will act in the forward directionB. Friction will act in the backward direction

C. Frictional force will not act

D. Frictional force will be μMg

Answer: C

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36. A p-n junction in series with a resistance of $5k\Omega$ is connected across a 50 V DC source . If the forward bias resistance of the junction is 50Ω , the forward bias current is

A. 1 mA

B. 2 mA

C. 20 mA

D. 9.9 mA

Answer: D



37. Given the following truth table where A , B

are inputs and Y the output :

- $A \quad B \quad Y$
- $0 \ 0 \ 1$
- $1 \quad 0 \quad 1$
- $0 \ 1 \ 1$
- $1 \quad 1 \quad 0$

The output Y is :

A. $A\overline{B}$

 $\mathsf{B}.\,\overline{A}B$

C. AB

D. \overline{AB}

Answer: D

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38. A steel wire , of uniform area $2mm^2$, is heated up to $50^\circ C$ and is stretched by tying its ends rigidly . The change in tension , when the temperature falls from $50^\circ C$ to $30^\circ C$ is (Take

$$Y = 2 imes 10^{11} Nm^{-2}, lpha = 1.1 imes 10^{-5^\circ C - 1} ig)$$

A. $1.5 imes 10^{10}N$

B. 5 N

C. 88 N

D. $2.5 imes 10^{-10}N$

Answer: C

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A. $\left[M^1L^1T^2\right]$

B.
$$\left[M^{-1}L^{1}T^{2}
ight]$$

C. $\left[M^{-1}L^{-1}T^{-2}
ight]$
D. $\left[M^{1}L^{-1}T^{-2}
ight]$

Answer: D

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40. If θ is the polarising angle for two optical media whose critical angles are C_1 and C_2 , then the correct relation is

$$A. \sin \theta = \frac{\sin C_2}{\sin C_1}$$
$$B. \theta = \frac{\sin C_2}{\sin C_1}$$
$$C. \tan \theta = \frac{\sin C_1}{\sin C_2}$$
$$D. \sin \theta = \frac{\sin C_1}{\sin C_2}$$

Answer: C



41. At the first minimum adjacent to the central maximum of a single-slit diffraction pattern, the phase difference betwee the

huygen's wavelet from the edge of the slit and

the wavelet from the midpoint of the slit is:

A.
$$rac{\pi}{2}$$
 rad

B. πrad

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

D.
$$\frac{\pi}{4}$$
 rad

Answer: B



42. An object of specific gravity ρ is hung from a thin steel wire. The fundamental frequency for transverse standing waves in the wire is 300 Hz. The object is immersed in water, so that one half of its volume is submerged . The new fundamental frequency (in Hz) is

(a)
$$300 \left(\frac{2\rho - 1}{2\rho}\right)^{\frac{1}{2}}$$

(b) $300 \left(\frac{2\rho}{2\rho - 1}\right)^{\frac{1}{2}}$
(c) $300 \left(\frac{2\rho}{2\rho - 1}\right)$
(d) $300 \left(\frac{2\rho - 1}{2\rho}\right)$

A.
$$300 \left(\frac{2\rho - 1}{2\rho}\right)^{\frac{1}{2}}$$

B. $300 \left(\frac{2\rho}{2\rho - 1}\right)^{\frac{1}{2}}$
C. $300 \left(\frac{2\rho}{2\rho - 1}\right)$
D. $300 \left(\frac{2\rho - 1}{2\rho}\right)$

Answer: A



43. Two sound waves of wavelength 1m and 1.01m in a gas produce 10 beats in 3s. The

velocity of sound in the gas is

A. $150 m s^{-1}$

B. $115.2ms^{-1}$

C. $336.6ms^{-1}$

D. $200 m s^{-1}$

Answer: C

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44. A uniform chain of length 2m is kept on a table such that a length of 60cm hangs freely from the edge of the table . The total mass of the chain is 4kg What is the work done in pulling the entire the chain the on the table ?

- A. 7.2 J
- B. 3.6 J
- C. 120 J
- D. 1200 J

Answer: B

