



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET TEST 25

Physics

1. Which among the following is correct regarding diamagnetic materials?

- A. They have a small positive magnetic susceptibility.
- B. They have a large and negative magnetic susceptibility.
- C. They are freely attracted by magnets.
- D. They are freely repelled by magnets.

Answer: D



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2. By increasing the temperature , the specific resistance of a conductor and a semiconductor

A. both conductor and semiconductor increases

B. both conductor

C. conductor increases and semiconductor decreases

D. conductor decreases and semiconductor increases

Answer: C



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3. A cell in the secondary circuit gives null deflection for 2.5 m length of a potentiometer having 10m length of wire. If the length of the potentiometer wire is increased by 1m without changing the cell in the primary, the position of the null point will be

A. 3.5 m

B. 3 m

C. 2.75 m

D. 2 m

Answer: C



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4. Two coils have a mutual inductance $0.005H$.

The current changes in the first coil according

to equation $I = I_0 \sin \omega t$, where $I_0 = 10A$

and $\omega = 100\pi$ radian//sec`. The maximum value of e.m.f. in the second coil is

A. 2π

B. 5π

C. π

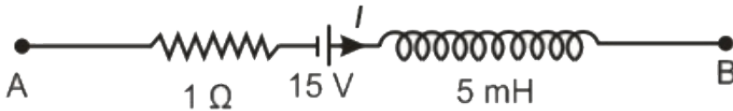
D. 4π

Answer: B



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5. The network shown in the figure is part of a complete circuit instant the current (I) is 5A and is decreasing at a rate of 10^3 A s^{-1} , then the value of $V_B - V_A$ is



- A. 10 V
- B. 20 V
- C. 15 V
- D. 25 V

Answer: C



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6. Two capacitors of capacitance of $6\mu F$ and $12\mu F$ are connected in series with a battery. The voltage across the $6\mu F$ capacitor is 2V. Compute the total battery voltage.

A. 4 V

B. 6 V

C. 9 V

D. 3 V

Answer: D



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7. The electrostatic potential due to an electric dipole at an equatorial point is

A. maximum

B. zero

C. minimum

D. not defined

Answer: B



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8. The condition under which a point charge moving through a magnetic field, experiences maximum force (in terms of magnitude) is

A. $\vec{v} \parallel \vec{B}$

B. $\theta = 45^\circ$ between v and B

C. $\vec{v} \perp \vec{B}$

D. charge is positive

Answer: C



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9. The force acting per unit length on one conductor due to the other for two long parallel current - carrying wires is

A. $\frac{\mu_0}{4\pi} \frac{I_1 I_2}{r}$

B. $\frac{\mu_0}{4\pi} \frac{I_1 I_2}{r}$

C. $\frac{\mu_0}{4\pi} \frac{2I_1 I_2}{r}$

D. $\frac{\mu_0}{4\pi} \frac{I_1 I_2}{4r}$

Answer: C



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10. For the moon, the wavelength corresponding to the maximum spectral emissive power is 14 microns. If the Wien's

constant $b = 2.884 \times 10^{-3} mK$, then the temperature of the moon is close to

A. 206 K

B. 112 K

C. 314 K

D. 156 K

Answer: A



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11. A Carnot engine operates with a source at 500 K and sink at 375 K. Engine consumes 600 kcal of heat per cycle. The heat rejected to sink per cycle is

A. 250 kcal

B. 350 kcal

C. 450 kcal

D. 550 kcal

Answer: C



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12. The molar heat capacity of oxygen gas at *STP* is nearly $2.5R$. As the temperature is increased, it gradually increase and approaches $3.5R$. The most appropriate reason for this behaviour is that at high temperatures

- A. oxygen does not behave as an ideal gas
- B. oxygen molecules dissociate into atoms
- C. the molecules collide more frequently

D. molecular vibrations gradually become effective

Answer: D



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13. One litre of oxygen at a pressure of 1 atm and two litres of nitrogen at a pressure of 0.5 atm are introduced into a vessel of volume 1 litre. If there is no change in temperature, the final pressure of the mixture of gas (in atm) is

A. 1.5

B. 2.5

C. 2

D. 4

Answer: C



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14. Two spheres A and B have diameters in the ratio 1:2, densities in the ratio 2:1 and

specific heat in the ratio 1 : 3. Find the ratio of their thermal capacities.

A. 1 : 6

B. 1 : 12

C. 1 : 3

D. 1 : 4

Answer: B



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15. A string of mass per unit length 0.2 kg m^{-1} and length 0.6 m is fixed at both ends such that it has a tension of 80 N . If the string is vibrating in its second overtone mode, then the frequency of the string is

A. 40 Hz

B. 50 Hz

C. 60 Hz

D. 70 Hz

Answer: B



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16. If a body is projected with an angle θ to the horizontal, then

A. its velocity is always perpendicular to its acceleration

B. its velocity becomes zero at its maximum height

C. its velocity makes zero angle with the horizontal at its maximum height

D. just before hitting the ground, the direction of velocity coincides with with the acceleration

Answer: C



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17. A boat which has a speed of 5kmh^{-1} in still water crosses a river of width 1 km along the shortest possible path in 15 minutes. Calculate the velocity of river water.

A. 3

B. 4

C. $\sqrt{21}$

D. 1

Answer: A



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18. A block of mass 1 kg is placed on a truck which accelerates with acceleration $5ms^{-2}$. The coefficient of static friction between the

block and truck is 0.6. The frictional force acting on the block is

A. 5 N

B. 6 N

C. 5.82 N

D. 4.6 N

Answer: A



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19. The Energy (E) angular momentum (L) and universal gravitational constant (G) are chosen as fundamental quantities. The dimensions of universal gravitational constant in the dimensional formula of Planks constant (h) is

A. zero

B. -1

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

D. 1

Answer: A



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20. A body of mass 10 kg is moving on a horizontal surface by applying a force of 10 N in the forward direction. The body moves with a constant velocity of 0.2ms^{-1} . Work done by the force of friction in the first 10 seconds is

A. -20J

B. 10 J

C. 20 J

D. -5 J

Answer: A



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21. A circular hole is cut from a disc of radius 6 cm in such a way that the radius of the hole is 1 cm and the centre of 3 cm from the centre of the disc. The distance of the centre of mass of

the remaining part from the centre of the original disc is

A. $\frac{3}{35} \text{ cm}$

B. $\frac{1}{35} \text{ cm}$

C. $\frac{3}{10} \text{ cm}$

D. none of these

Answer: A



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22. Find the maximum speed with which an automobile can round a curve of radius 8 m without slipping if the road is unbanked and the coefficient of friction between the road and the tyres is 0.8 ($g = 10 \text{ m/s}^2$)

A. 8 m/s^{-1}

B. 10 m/s^{-1}

C. 20 m/s^{-1}

D. none of these

Answer: A



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23. Imagine a light planet revolving around a very massive star in a circular orbit of radius R with a period of revolution T . If the gravitational force of attraction between the planet and the star is proportional to $R^{-5/2}$, then

A. T^2 is proportional to R^2

B. T^2 is proportional to $R^{\frac{7}{2}}$

C. T^2 is proportional to $R^{\frac{3}{2}}$

D. T^2 is proportional to $R^{\frac{5}{2}}$

Answer: B



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24. At what height above the surface of the earth will the acceleration due to gravity be 25 % of its value on the surface of the earth ?

Assume that the radius of the earth is 6400 km .

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

B. R

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

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

Answer: B



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25. A particle is executing simple harmonic motion with an amplitude A and time period T . The displacement of the particles after $2T$ period from its initial position is

A. A

B. 4A

C. 8A

D. zero

Answer: D



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26. If at some instant of time, the displacement of a simple harmonic oscillator

is 0.02 m and its acceleration is 2ms^{-2} , then the angular frequency of the oscillator is

A. 100 rad s^{-1}

B. 10 rad s^{-1}

C. 1 rad s^{-1}

D. 0.1 rad s^{-1}

Answer: B



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27. A vertical capillary of radius r is brought in contact with water of density ρ and surface tension S . If the angle of contact is zero, then the amount of heat liberated while the water rises along the capillary, is

A. $\frac{2\pi S^2}{\rho g}$

B. $\frac{\pi s^2}{\rho g}$

C. Zero

D. $\frac{4\pi S^2}{\rho g}$

Answer: A



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28. A closed compartment containing gas is moving with some acceleration in horizontal direction. Neglect effect of gravity. Then the pressure in the compartment is

- A. same every where
- B. lower in front side
- C. lower in rear side
- D. lower in upper side

Answer: B



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29. When a ceiling fan is switched on, it makes 10 rotations in the first 3 seconds. Assuming a uniform angular acceleration, how many rotation it will make in the next 3 seconds?

A. 10

B. 20

C. 40

D. 40

Answer: D



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30. Let I be the moment of inertia of a uniform square plate about an axis AB that passes through its centre and is parallel to two of its sides. CD is a line in the plane of the plate that passes through the centre of the plate and makes an angle θ with AB . The

moment of inertia of the plate about the axis

CD is then equal to-

A. I

B. $I \sin^2 \theta$

C. $I \cos^2 \theta$

D. $I \cos^2 \cdot \frac{\theta}{2}$

Answer: A



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31. The shortest wavelength of X-rays emitted from an X-rays tube depends on

A. the current in the tube

B. the voltage applied to the tube

C. the nature of the gas in tube

D. the atomic number of the target material

Answer: B



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32. An X - ray tube produces a continuous spectrum of radiation with its shortest wavelength of $45 \times 10^{-2} \text{ \AA}$. The maximum energy of a photon in the radiation in eV is $(h = 6.62 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1})$

A. 27500

B. 22500

C. 17500

D. 12500

Answer: A



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33. The half - life of ^{131}I is 8 days. Given a sample \leq of ^{131}I at time $t = 0$, we can assert that

- A. No nucleus will decay before $t = 4$ days
- B. No nucleus will decay before $t = 8$ days
- C. No nucleus will decay before $t = 16$ days

D. A given nucleus may decay at any time
after $t = 0$

Answer: D



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34. The maximum kinetic energy of photo electrons emitted from a surface when photons of energy $6eV$ fall on it is $4eV$. The stopping potential in volt is

(a) 2 (b) 4 (c) 6 (d) 10

A. 2

B. 4

C. 6

D. 8

Answer: B



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35. The work function of a substance is 4.0 eV.

The longest wavelength of light that can cause

photoelectron emission from this substance is approximately equal to

A. 540 nm

B. 400 nm

C. 310 nm

D. 220 nm

Answer: C



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36. At absolute zero , Si acts as

A. non - metal

B. metal

C. insulator

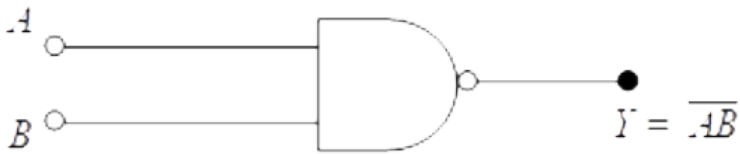
D. none of these

Answer: C



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37. The logic gate given below represents a



A. NAND gate

B. NOR gate

C. OR gate

D. AND gate

Answer: A



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38. In the middle of the depletion layer of a reverse - biased $p - n$ junction , the

- A. electric field is zero
- B. potential is maximum
- C. electric field is maximum
- D. potential is zero

Answer: A



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39. How does the angle of minimum deviation of a glass prism vary, if the incident violet light is replaced with red light?

A. None of these

B. Increases

C. No change

D. Decreases

Answer: D



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40. A ball is dropped from a height of 20 m above the surface of water in a lake. The refractive index of water is 4.3. A fish inside the lake, in the line of fall of the ball, is looking at the ball. At an instant, when the ball is 12.8 m above the water surface, the fish sees the speed of the ball as $\left[Take_g = 10 \frac{m}{s^2}.\right]$

A. $9ms^{-1}$

B. $12ms^{-1}$

C. $16ms^{-1}$

D. $21.33ms^{-1}$

Answer: C



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41. The way the fringe pattern changes when the screen is moved away from the slits is

- A. width of fringes increases
- B. width of fringe decreases
- C. no changes observed
- D. change will vary

Answer: A



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42. In Young's double slit experiment, the 10th maximum of wavelength λ_1 is at distance of y_1 from the central maximum. When the wavelength of the source is changed to λ_2 , 5th maximum is at a distance of y_2 from its central maximum. Then $\frac{y_1}{y_2}$ is

A. $\frac{2\lambda_1}{\lambda_2}$

B. $\frac{2\lambda_2}{\lambda_1}$

C. $\frac{\lambda_1}{2\lambda_2}$

D. $\frac{\lambda_2}{2\lambda_1}$

Answer: A



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43. When unpolarised light beam is incident from air onto glass ($n = 1.5$) at the polarising angle

- A. reflected beam is polarised 100 percent
- B. reflected and refracted beams are partially polarised
- C. the reason for reflected beam getting 100 % polarised is the almost all the light is reflected
- D. all of the above

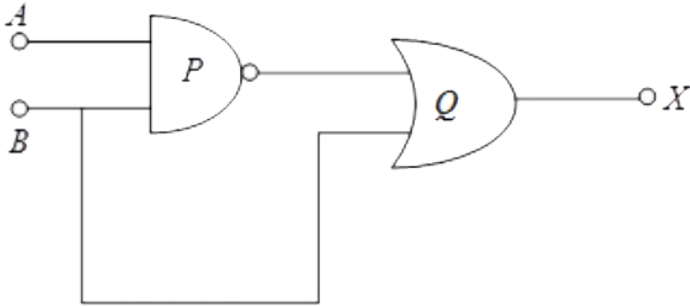
Answer: A



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44. Write down the output at X for the inputs

$A = 0, B = 0$ and $A = 1, B = 1$



A. $X = 1$ and 0

B. $X = 1$ and 1

C. $X = 0$ and 1

D. $X = 0$ and 0

Answer: B



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45. Two blocks of masses 10 kg and 4 kg are connected by a spring of negligible mass and placed on a frictionless horizontal surface. An impulse gives a velocity of 14 m/s to the heavier block in the direction of the lighter block. The velocity of the centre of mass is

A. 30 m s^{-1}

B. 20 m s^{-1}

C. 10 m s^{-1}

D. $5ms^{-1}$

Answer: C



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