



PHYSICS

BOOKS - CHHAYA PHYSICS (BENGALI ENGLISH)

QUESTION PAPERS OF NEET -2018

Question

1. The fundamental frequency in an open organ pipe is equal to the third harmonic of a

closed organ pipe . If the length of the closed organ pipe is 20 cm , the length of the open organ pipe is

A. 12.5cm

B. 8cm

C. 13.2cm

D. 16cm

Answer:



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2. At what temperature will the rms speed of oxygen molecules become just sufficient for escaping from the Earth's atmosphere ? [given . Mass of oxygen molecules $(m) = 2.76 \times 10^{-26}$ kg , Boltzman's constant $K_B = 1.38 \times 10^{-23} J \cdot k^{-1}$]

A. $5.016 \times 10^4 K$

B. $8.360 \times 10^4 K$

C. $2.508 \times 10^4 K$

D. $1.254 \times 10^4 K$

Answer:



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3. The efficiency of an ideal heat engine working between the freezing point and boiling point of water is

A. 6.25 %

B. 20 %

C. 26.8 %

D. 12.5 %

Answer:



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4. A carbon resistor of $(47 \pm 4.7) K\Omega$ is to be marked with rings of different colours for its identification . The colour code sequence will be

- A. yellow - Green - Violet - Gold
- B. Yellow-Violet - Orange -Silver
- C. Violet -Yellow - orange - silver

D. Green - Orange - Violet - Gold

Answer:



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5. A set of n equal resistors, of value R each, are connected in series to a battery of emf E and internal resistance R . The current drawn is I . Now the n resistors are connected in parallel to the same battery. Then the current

drawn from battery becomes 10 l . the value of
n is

A. 20

B. 11

C. 10

D. 9

Answer:



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6. A battery consists of a variable number n of identical cells (having internal resistance r each) which are connected in series . The terminals of the battery are shortcircuited and the current I is measured . Which of the graph shows the current relationship I and n ?

A. 

B. 

C. 

D. 

Answer:



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7. Unpolarised is incident from air on a plane surface of a material of refractive index μ . At a particular angle of incidence I . It is found that the reflected and refracted rays are perpendicular to each other . Which of the following options is correct for this situation ?

$$\text{A. } I = \sin^{-1} \left(\frac{1}{\mu} \right)$$

B. Reflected light is polarised with its electric vector perpendicular to the incidence

C. Reflected light is polarised with its electric vector parallel to the plane of incidence

D. $I = \tan^{-1} \left(\frac{1}{\mu} \right)$

Answer:



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8. In young's double experiment the separation d between the slits is 2 mm, the wavelength λ of the used is 5896\AA and distance D between the screen and slits is 100 cm . It is found that the angular width of the angular width of the fringes is 0.20° . To increase the fringe angular width to 0.21° (with same λ and D) the separation between the slits needs to be changed to

A. 2.1mm

B. 1.9mm

C. 1.8mm

D. 1.7mm

Answer:



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9. An astronomical refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of

A. large focal length diameter

B. large focal length and small diameter

C. small focal length and large diameter

D. small focal length and small diameter

Answer:



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10. The ratio of kinetic energy to the total energy of an electron in a Bohr of the hydrogen atom is

A. 2: - 1

B. 1: - 1

C. 1: 1

D. 1: - 2

Answer:



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11. An electron of mass m with an initial velocity $\vec{V} = v_0 \hat{i}$ ($V_0 > 0$) enters an electric field $\vec{E} = -E_0 \hat{i}$ ($E_0 = \text{constant} > 0$) at

$t=0$. If λ_0 is its broglie wavelength initially ,
then its de Broglie wavelength at time t is

A. $\lambda_0 t$

B. $\lambda_0 \left(1 + \frac{eE_0}{mV_0} t \right)$

C. $\frac{\lambda_0}{(1 +)eE_0 / ((mV_0)t)}$

D. λ_0

Answer:



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12. For a radioactive material , half - life is 10 minutes . If initially there are 600 number of nuclei , the time taken (in minutes) for the distingration of 450 nuclei is

- A. 3
- B. 10
- C. 20
- D. 15

Answer:



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13. When the light of frequency $2V_0$ (where V_0 is threshold frequency) is incident on a metal plate the maximum velocity of electrons emitted is V_1 . When the frequency of the incident radiation is increased to $5V_0$, the maximum velocity of electron emitted from the same plate is V_2 . the ratio of V_1 to v_2 is

A. 4: 1

B. 1: 4

C. 1:2

D. 2:1

Answer:



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14. In a p-n junction diode , change in temperature due to heating

A. does not affect resistance of p-n junction

B. affects only forward resistance

C. affects only reverse resistance

D. affects the overall V-I characteristics of
p-n junction

Answer:



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15. In the combination of the following gates
the output Y can be written in terms of inputs
A and B as

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A. $\overline{A \cdot B} + A \cdot B$

B. $A \cdot \overline{B} + \overline{A} \cdot B$

C. $\overline{A \cdot B}$

D. $\overline{A + B}$

Answer:



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16. An EM wave is propagating in a medium with a velocity $\vec{v} = v\hat{i}$. The instantaneous oscillating electric field of this EM wave is along + y axis, then the direction of oscillating magnetic field of the EM wave will be along

A. $-y$ direction

B. $+z$ direction

C. $-z$ direction

D. $-x$ direction

Answer:



17. The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30° . One of the two refracting surfaces of the prism is made a mirror inwards , by silver coating . A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is

A. 30°

B. 45°

C. 60°

D. zero

Answer:



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18. An object is placed at a distance of 40 cm from a concave mirror of focal length 15 cm . If the object is displaced through a distance of

20 cm towards the mirror , the displacement of the image will be

- A. 30 cm towards the mirror
- B. 36 cm away from the mirror
- C. 30 cm away from the mirror
- D. 36 cm towards the mirror

Answer:



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19. The magnetic potential energy stored in a certain inductor is 25 mJ . When the current in the inductor is 60 mA. This inductor is of inductance

A. $1.389H$

B. $138.88H$

C. $0.138H$

D. $13.89H$

Answer:



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20. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E . The direction of electric field is now reversed keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h . The time of fall of the electron, in comparison to the time of fall of the proton is

A. 10 times greater

B. 5 times greater

C. smaller

D. equal

Answer:



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21. The electrostatic force between the metal plates of an isolated parallel plate capacitor C having a charge Q and area A , is

A. proportional to the square root of the distance between the plates

B. linearly proportional to the distance between the plates

C. independent of the distance between the plates

D. inversely proportional to the distance between the plates

Answer:



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22. A tuning fork is used to produce resonance in a glass tube . The length of the air column in this tube can be adjusted by a variable piston .At room temperature of $27^{\circ}C$ two successive resonances are produced at 20 cm and 73 cm of column length . if the frequency of the tuning fork is 320 Hz , the velocity of sound in air at $27^{\circ}C$ is

A. $350m / s$

B. $339m / s$

C. $330\text{m} / \text{s}$

D. $300\text{m} / \text{s}$

Answer:



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23. A pendulum is hung from the roof of a sufficiently high building and is moving freely to and fro like a simple harmonic oscillator . The acceleration of the bob of the mean position . The time period of oscillation is

A. $2s$

B. πs

C. $2\pi s$

D. $1s$

Answer:



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24. A metallic rod of mass per unit length $0.5 \text{ Kg. } M^{-1}$ is lying horizontally on a smooth inclined plane which makes an angle of 30°

with the horizontal . The rod is not allowed to slide down by flowing a current through it when a magnetic field of induction 0.25 T is acting on it in the vertical direction . The current flowing in the rod to keep it stationary is

A. $14.76A$

B. $5.98A$

C. $7.14A$

D. $11.32A$

Answer:



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25. A thin diamagnetic rod is placed vertically between the poles of an electromagnet . When the current in the electromagnet is switched on , then the diamagnetic rod is pushed up , out of the horizontal magnetic field . Hence the rod gains gravitational potential energy . The work required to do this comes from

A. the lattice structure of the material of the rod

B. the magnetic field

C. the current source

D. the induced electric field due to the
changing magnetic field

Answer:



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26. An inductor 20 mH , a capacitor $100 \mu\text{F}$ and a resistor 50Ω are connected in series across a

source of emf , $V = 10 \sin 314t$. The power loss in the circuit is

A. $2.74W$

B. $0.43W$

C. $0.79W$

D. $1.13W$

Answer:



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27. Current sensitivity of a moving coil galvanometer is 5 div /mA and its voltage sensitivity (angular deflection per unit voltage applied) is 20 div / v . The resistance of the galvanometer is

A. 250Ω

B. 25Ω

C. 40Ω

D. 500Ω

Answer:



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28. Three objects ,A (a solid sphere) , B (a thin circular disc) and C (a circular ring) , each have the same mass M and radius R . They all spin with the same angular speed ω about their own symmetry axes . The amounts of work (W) required to bring them to rest , would satisfy the relation

A. $W_B > W_A > W_C$

B. $W_A > W_B > W_C$

C. $W_C > W_B > W_A$

D. $W_A > W_C > W_B$

Answer:



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29. A moving block having mass m , collides with another stationary block having mass $4m$. The lighter block comes to rest after collision . When the initial velocity of the lighter block is

v , then the value of coefficient of restitution
(e) will be

A. 0.8

B. 0.25

C. 0.5

D. 0.4

Answer:



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30. Which one of the following statements is incorrect ?

A. Frictional force opposes the relative motion

B. Limiting value of static friction is directly proportional to normal reaction

C. Rolling friction is smaller than sliding friction

D. Coefficient of sliding friction has dimensions of length

Answer:



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31. The moment of the force $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at $(2, 0, -3)$ about the point $(2, -2, -2)$, is given by

A. $-7\hat{i} - 8\hat{j} - 4\hat{k}$

B. $-4\hat{i} - \hat{j} - 8\hat{k}$

C. $-8\hat{i} - 4\hat{j} - 7\hat{k}$

D. $-7\hat{i} - 4\hat{j} - 8\hat{k}$

Answer:



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32. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm . The main scale reading is 5 mm and zero of circular scale division coincides with 25

divisions above the reference level . If screw gauge has a zero error of $- 0.004 \text{ cm}$, the correct diameter of the ball is

A. 0.053 cm

B. 0.525 cm

C. 0.521 cm

D. 0.529 cm

Answer:



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33. A solid sphere is rotating freely about its symmetry axis in free space . The radius of the sphere is increases keeping its mass same . Which of the following physical quantities would remain constant for the sphere ?

- A. Rotational kinetic energy
- B. Moment of inertia
- C. Angular velocity
- D. Angular momentum

Answer:





34. IF the mass of the sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude , which of the following is not correct ?

A. Time period of a simple pendulum on the earth would decrease

B. Walking on the ground would become more difficult

C. raindrops will fall faster

D. g on the earth will not change

Answer:



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35. A solid sphere is in rolling motion a body possesses translational kinetic energy (K_t) as well as rotational kinetic energy (K_r) simultaneously. The ratio $K_t : (K_t + K_r)$ for the sphere is

A. 10:7

B. 5:7

C. 7:10

D. 2:5

Answer:



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36. The power radiated by a block is P and it radiates maximum energy at wavelength, λ_0 .
If the temperature of the block body is now

changed so that it radiates maximum energy at wavelength $\frac{3}{4}\lambda_0$, the power radiated by it becomes nP . the value of n is

A. $\frac{256}{81}$

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

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

D. $\frac{81}{256}$

Answer:



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37. Two wires are made of the same material and have the same volume. The first wire has cross sectional area A and the second wire has cross sectional area $3A$. If the length of the first wire is increased by Δl on applying a force F , how much force is needed to stretch the second wire by the same amount?

A. $4F$

B. $6F$

C. $9F$

D. F

Answer:



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38. A sample of 0.1 g of water at $100^{\circ}C$ and normal pressure ($1.013 \times 10^5 N \cdot m^{-2}$) requires 54 cal of heat energy to convert to steam at $100^{\circ}C$. If the volume of the steam produced is 167.1cc, the change in internal energy of the sample, is

A. 42.2J

B. $208.7J$

C. $104.3J$

D. $84.5J$

Answer:



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