



PHYSICS

BOOKS - SARAS PUBLICATION

MODEL QUESTION PAPER 1

Exercise

1. Ionization potential of hydrogen atom is 13.6 eV. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon

energy 12.1 eV. The spectral lines emitted by hydrogen atoms according to Bohr's theory will be

A. two

B. three

C. four

D. one

Answer:



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2. The temperature of inversion of a thermocouple is $620^{\circ}C$ and the neutral temperature is $300^{\circ}C$. What is the temperature of cold junction?

A. $20^{\circ}C$

B. $320^{\circ}C$

C. $-20^{\circ}C$

D. $40^{\circ}C$

Answer:



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3. The resultant of $\vec{A} \times 0$ will be equal to:

A. zero

B. A

C. zero vector

D. unit vector

Answer:



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4. The dimension of magnetic field in M, L, T and C (coulomb) is given as

A. $MLT^{-1}C^{-1}$

B. $MLT^{-1}C^{-1}$

C. MT^2C^{-2}

D. $MT^{-1}C^{-1}$

Answer:



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5. If a wire of resistance R is stretched to double its length, then the new resistance is:

A. $4R$

B. $2R$

C. R

D. none of these

Answer:



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6. A 600 Kg, rocket is set for a vertical firing. If the exhaust speed is 1000m/s , the gas ejected per sec. to supply the thrust needed to overcome the weight of rocket is ...

A. 117.6kg/s

B. 58.8kg/s

C. 6kg/s

D. 76.4kg/s

Answer:



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7. If the unit of force and length each be increased by four times, then the unit of energy is increased by ...

A. 16 times

B. 2 times

C. 8 times

D. 4 times

Answer:



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8. Angular velocity of minute's hand of a clock
in *radian* / sec is

A. $\frac{\pi}{30}$

B. $\frac{\pi}{1800}$

C. $\frac{2\pi}{30}$

D. $\frac{2\pi}{100}$

Answer:



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9. A constant torque acting on a uniform circular wheel changes its angular momentum from A° to $4A^\circ$ in 4 sec. The value of torque will be

A. $4A^\circ$

B. $12^\circ A$

C. $A^\circ A$

D. $\frac{3A^\circ}{4}$

Answer:



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10. What are the dimensions of gravitational constant

A. $ML^{-3}T^2$

B. $M^{-1}L^{-3}T^2$

C. $M^{-1}L^3T^{-2}$

D. ML^2T^{-2}

Answer:



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11. The distance between centre of the earth and moon is 384000 Km. If the mass of the earth is $6 \times 10^{24} \text{ kg}$ and G is $6.66 \times 10^{-11} \text{ Nm}^2 / \text{kg}^2$. The speed of the moon is nearly

A. $11.2 \text{ km} / \text{sec}$

B. $4 \text{ km} / \text{sec}$

C. $1 \text{ km} / \text{sec}$

D. $8 \text{ km} / \text{sec}$

Answer:



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12. Length of wire is doubled, when ' 20×10^8 '
 N/m^2 stress is applied on it N/m^2 will be

A. 20×10^8

B. 20×10^9

C. 20×10^{10}

D. 10×10^8

Answer:



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13. If S_P and S_V denote the specific heats of nitrogen gas per unit mass at constant pressure and constant volume respectively, then

A. $C_P - C_v = \frac{R}{28}$

B. $C_P - C_v = \frac{R}{14}$

C. $C_P - C_v = R$

$$D. C_P - C_v = 28R$$

Answer:



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14. When a metallic bar is heated from $0^\circ C$ to $100^\circ C$, its length increases by 0.05 %, what is the co-efficient of linear expansion of the metal?

A. $5 \times 10^{-5} \text{ } ^\circ C^{-1}$

B. $5 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$

C. $5 \times 10^{-4} \text{ } ^\circ\text{C}^{-1}$

D. $5 \times 10^{-3} \text{ } ^\circ\text{C}^{-1}$

Answer:



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15. If the temperatures of a black body increases from 7°C to 287°C then, the rate of energy of radiation is

A. 4 times

B. 16 times

C. 8 times

D. 2 times

Answer:



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16. Estimate the fraction of molecular volume to the actual volume occupied by oxygen gas

at STP. Take the diameter of an oxygen molecule to be $3\overset{\circ}{\text{A}}$

A. $3.8 \times 10^{(-4)}$

B. 20.19×10^{-3}

C. 40.29×10^{-4}

D. 30.39×10^4

Answer:



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17. The density of air at a pressure of $10^{-5} Nm^{-2}$ is $1.2 kgm^{-3}$. Under these conditions, the root mean square velocity of the air molecules in ms^{-1} is

A. 500

B. 1000

C. 1500

D. 3000

Answer:



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18. The shortest distance travelled by a particle executing SHM from mean position in 2 seconds is equal to $\frac{\sqrt{3}}{2}$ times of its amplitude . Determine its time period .

A. $T = 08$ second

B. $T = 10$ second

C. $T = 12$ second

D. $T = 14$ second

Answer:



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19. A body executing linear simple harmonic motion has a velocity of $3m/s$. When its displacement is 4 -cm. and a velocity of $4m/s$. when its displacement is 3 cm. What is the amplitude of oscillation?

A. 5 cm.

B. 7.5 cm

C. 10 cm

D. 12.5 cm

Answer:



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20. The work done in placing a charge of 8×10^{-18} coulomb on a condenser of capacity 100 microfarad is .

A. $16 \times 10^{-32} J$

B. $3.1 \times 10^{-26} J$

C. $4 \times 10^{-10} J$

D. $32 \times 10^{-32} J$

Answer:



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21. The gravitational potential at a point due to a point mass is $V =$

A. r, r^{-1}

B. r^{-1}, r^{-2}

C. r^{-2}, r^{-3}

D. r^{-2}, r^{-2}

Answer:



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22. What length of the wire of specific resistance $48 \times 10^{-8} \Omega m$ is needed to make a resistance of 4.2Ω (diameter of wire = 0.4 mm)

A. 4.1 m

B. 3.1 m

C. 2.1 m

D. 1.1 m

Answer:



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23. Kirchoff's II law is a consequence of conservation of _____

A. momentum

B. charge

C. energy

D. sum of mass and energy

Answer:



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24. A current 1 ampere is passed through a straight wire of length 2.0 meters. The magnetic field at a point in air at a distance of

3 meters from either end of wire and lying on the axis of wire will be

A. $\frac{\mu_0}{2\pi}$

B. $\frac{\mu_0}{8\pi}$

C. $\frac{\mu_0}{4\pi}$

D. Zero

Answer:



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25. The dimensions of magnetic field intensity

H are

A. $M^0 L^0 T^{-1} Q^{-1}$

B. $ML^{-2}T^{-2}Q$

C. $ML^0T^{-2}A^{-1}$

D. Both(1)and(3)

Answer:



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26. A wire is situated in the eastwest direction and the current flowing through is 0.3 ampere. The wire is held perpendicular to magnetic field of $0.2 \times 10^{-4} \text{ N(amp -meter)}$. The force acting on the wire will be

A. 1×10^{-15}

B. 4×10^{-5}

C. 1×10^{-6}

D. 0.0

Answer:





27. A long solenoid $200\text{turns}/\text{cm}$ and carries a current I . The magnetic field at its centre is $6.28 \times 10^{-2}\text{wbm}^{-2}$. Another long solenoid has $100\text{turns}/\text{cm}$. and it carries a current $I/3$. The value of the magnetic field at its centre is

A. $1.05 \times 10^{-2}\text{wbm}^{-2}$

B. $1.05 \times 10^{-5}\text{wbm}^{-2}$

C. $1.05 \times 10^{-3}\text{wbm}^{-2}$

$$D. 1.05 \times 10^{-4} \text{ wbm}^{-2}$$

Answer:



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28. If $\mu_0 = 4\pi \times 10^{-7} \text{ TmA}^{-1}$ and

$\epsilon_0 = 8.85 \times 10^{-2} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$. The value of

$\frac{1}{\sqrt{\mu_0 \epsilon_0}}$ is.....s

A. $3 \times 10^7 \text{ m/s}$

B. $3 \times 10^8 \text{ m/s}$

C. $4 \times 10^8 m / s$

D. $3 \times 10^{-8} m / s$

Answer:



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29. has the shortest wavelength

A. Ultra-violet

B. Microwaves

C. X-rays

D. Gamma rays

Answer:



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30. The minimum distance between the object and its real image for concave mirror is

A. F

B. $2F$

C. $4F$

D. zero

Answer:



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31. The angle of incident at which reflected light is totally polarised for reflection from air to glass (refractive index μ) is

A. $\sin^{-1}(n)$

B. $\sin^{-1}\left[\frac{1}{n}\right]$

C. $\tan^{-1} \left[\frac{1}{n} \right]$

D. $\tan^{-1} \left(\frac{1}{n} \right)$

Answer:



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32. A monochromatic source of light is placed at a distance d from a metal surface photoelectrons are ejected at n , kinetic energy being E . If the source is brought nearer to

distance $\frac{d}{2}$. The rate and kinetic energy per photo electron becomes nearly

A. $12n$ and $2E$

B. $4n$ and $4E$

C. $4n$ and E

D. n and $4E$

Answer:



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33. The work function for the surface of aluminium is 4.2 eV. What will be the wavelength of that incident light for which the stopping potential will be zero

A. 2496\AA

B. $2496 \times 10^{-7}m$

C. 2649\AA

D. 2946\AA

Answer:



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34. When a radio active isotopes ${}_{88}\text{Ra}^{228}$ decays in series by the emission of three α -particles and a β -particle, the isotopes finally formed is ...

A. ${}_{84}\text{X}^{220}$

B. ${}_{86}\text{X}^{222}$

C. ${}_{83}\text{X}^{216}$

D. ${}_{83}\text{X}^{215}$

Answer:



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35. A positron is emitted by a radioactive nucleus of atomic number 90. The product nucleus will have atomic number ...

A. 90

B. 96

C. 89

D. 98

Answer:



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36. Complete the table

\vec{a}	\vec{b}	$\vec{a} \cdot \vec{b}$	$\vec{b} \cdot \vec{a}$	$\vec{a} \times \vec{b}$	$\vec{b} \times \vec{a}$
i. $\hat{i} + 3\hat{j} + 4\hat{k}$	$4\hat{j} + 8\hat{k}$				
ii. $\hat{i} + \hat{j} - 6\hat{k}$	$2\hat{i} + \hat{j} + 8\hat{k}$				
iii. $2\hat{j} - 6\hat{k}$	$\hat{i} - 6\hat{j} + \hat{k}$				

A. NOR

B. OR

C. AND

D. NAND

Answer:



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37. Which one of the following has more volume. Iron block or a wooden block of same mass.

A. sun

B. a hot cup of tea

C. a red hot iron

D. question is irrelevant

Answer:



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38. Tritium has a half-life of 12.5 y undergoing beta decay. What fraction of a sample of pure tritium will remain undecayed after 25 y ?

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

B. $\frac{1}{8}$

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

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

Answer:



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39. The dark lines in the solar spectrum are called ____ lines.

- A. absorption of certain wavelengths,
producing dark lines in the solar system
- B. absence of certain elements in the sun
- C. black body radiations from the sun
- D. Scattering of light

Answer:



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40. In an P.N.P transistor circuit, the collector current is 10 mA. If 90% of the electrons emitted reach the collector.

- A. emitter current will be 9 mA
- B. emitter current will be 11.1mA
- C. base current will be 0.1 mA
- D. base current will be 0.0 mA

Answer:



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41. Focal length of an equiconvex lens is 20 cm. If we cut it once perpendicular to principal axis in and then along principal axis. Then, focal length of each part will be:

A. 20 cm

B. 10 cm

C. 40 cm

D. 5 cm

Answer:



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42. A black body is continuously radiating energy at a temperature of 2880 k if U_1 , U_2 and U_3 are the amount of radiation measured between the wavelength 599 & 600 nm , 999 & 1000 nm & 1499 & 1500 nm respectively then (wires constant $b = 2.88 \times 10^{26}$ kmk)

A. $U_1 > U_2$

B. $U_2 > U_1$

C. $U_1 = 0$

D. $U_3 = 0$

Answer:



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43. The wavelength of the K_α line for the uranium atom ($z = 92$) is ($R = 10^7 m^{-1}$)

A. 1.6 \AA

B. 0.16 \AA

C. 0.5 \AA

D. 2.0\AA

Answer:



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