PHYSICS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET SOLVED PAPER 2019 (22-04-2019, SHIFT-2)

Physics

1. If A represents density, B represents velocity, C represents specific heat capacity and D represents wavelength, then the quantity having the dimensions of product of A, B, C and D is

A. Stefan's constant

B. Botltzmann's constant

C. thermal conductivity

D. universal gas constant

Answer: C

Watch Video Solution

2. A ball dropped from a building of height 12 m falls on a slab of 1 m height from the ground and makes a perfect elastic collision. Later the ball falls on a wooden table of height 0.5 m, makes inelastic collision and falls on the ground. If the coefficient of restitution between the ball and the table is 0.5, then the velocity of the ball while touching the ground is about

(Acceleration due to gravity, $g = 10ms^{-2}$)

A. $15.5ms^{-1}$

B. $14.5ms^{-1}$

C. $9.2ms^{-1}$

D. $8.2ms^{-1}$

Answer: D

View Text Solution

3. Two food packets are thrown with the same velocity in the same direction with different angles of projection simultaneously. The angle

of projection of one packet is 15°. At the same moment one boy starts running from rest from the point of projection with an acceleration of $10ms^{-2}$ to catch them. If he caught one packet at a distance of 20 m and other packet in $\frac{1}{2}s$ later the first packet, then the angle of projection of the second packet is (Acceleration due to gravity, $g = 10ms^{-2}$)

A. $\frac{1}{2}\sin^{-1}\left(\frac{25}{32}\right)$

B. $\frac{1}{2}\sin^{-1}\left(\frac{8}{9}\right)$

C. $\frac{1}{2}\sin^{-1}\left(\frac{7}{8}\right)$

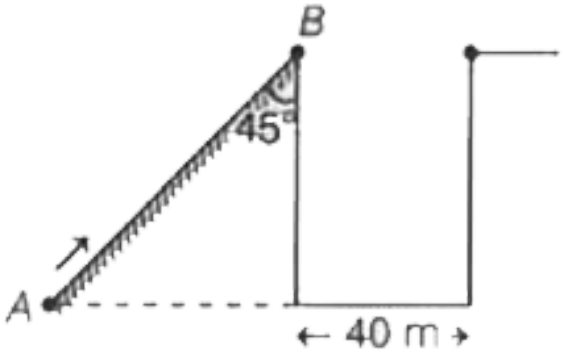
D. $\frac{1}{2}\sin^{-1}\left(\frac{5}{6}\right)$

Answer: A

Watch Video Solution

4. A body is projected up a smooth inclined plane of length $20\sqrt{2}m$ from point A as shown in the figure. The top of B of the inclined plane is connected to a well of diameter 40 m. If the body just manages to cross the well then the velocity of projection is

(Acceleration due to gravity, $g = 10ms^{-2}$)



A. $40ms^{-1}$

B. $40\sqrt{2}ms^{-1}$

C. $20ms^{-1}$

D. $20\sqrt{2}ms^{-1}$

Answer: D

Watch Video Solution

5. A body is acted on by a force given by $F = (15 + 3t^2)N$. The impulse received by the body during the first 2 seconds is

A. 28 Ns

B. 38 Ns

C. 30 Ns

D. 19 Ns

Answer: B

Watch Video Solution

6. A body starts sliding down from the top of an inclined plane at an angle θ with the horizontal direction. The first one third of the incline is smooth, the next one third has coefficient of friction $\frac{\mu}{2}$ and the last one third has coefficient of friction μ.

If the body comes to rest at the bottom of the plane then the value of μ is

A. $\frac{\tan\theta}{2}$

B. $\frac{3\tan\theta}{2}$

C. $\tan\theta$

D. 2tantheta`

Answer: D

View Text Solution

7. A motor pump a liquid of density ρ through a pipe of cross-sectional area A. If the liquid moves with a speed v in this pipe, then the

rate of kinetic energy imparted to the liquid is proportional to

A. v^2

B. v^3

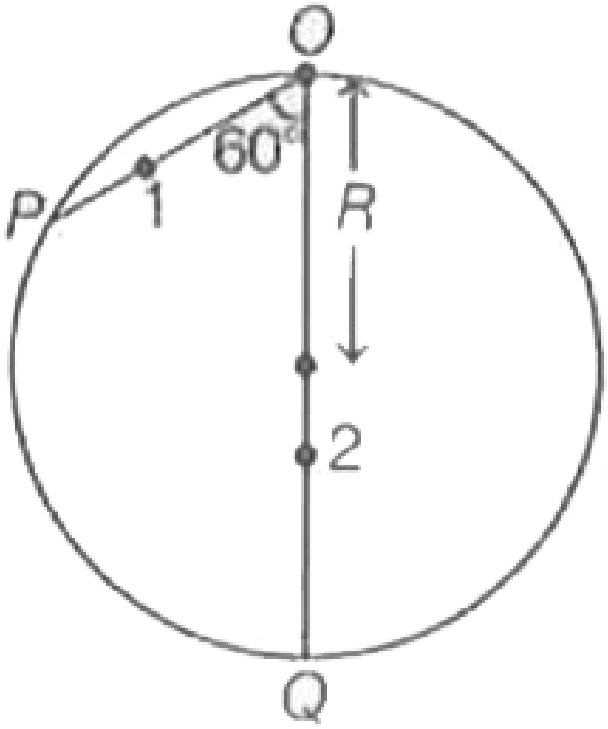
C. v^4

D. $\sqrt{v}$

Answer: B

Watch Video Solution

8. Two particles 1 and 2 are allowed to descend on two frictionless chords OP and OQ as shown in the figure. The ratio of the speeds of the particles 1 and 2, respectively when they reach the circumference is



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

B. 2

C. $\frac{3}{2}$

D. $\frac{2}{3}$

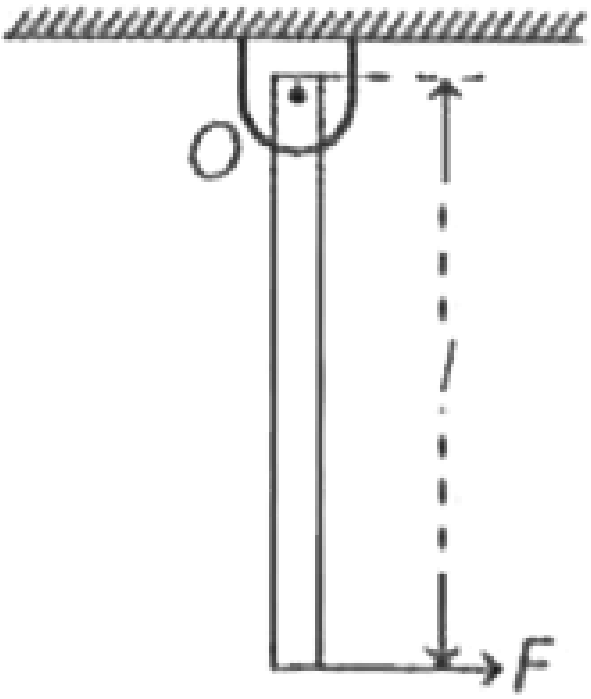
Answer: A

Watch Video Solution

9. A uniform rod of mass m and length l is pivoted smoothly at point O as shown in figure. If a horizontal force F acts at the

bottom of the rod and ω is the angular velocity of the rod which is a function of angle of rotation θ, then the maximum angular displacement of the rod is

(Acceleration due to gravity, g)



A. $\theta = 2\sin^{-1}\left(\frac{2F}{mg}\right)$

B. $\theta = 2\cos^{-1}\left(\frac{2F}{mg}\right)$

C. $\theta = 2\tan^{-1}\left(\frac{2F}{mg}\right)$

D. $\theta = 2\cot^{-1}\left(\frac{2F}{mg}\right)$

Answer: C

Watch Video Solution

10. An electric motor of power 75 W rotates a flywheel of moment of inertia 0.36 kg - m^2 at a constant rate of 100 rad s^{-1}. If the power is

switched off, the time taken for the wheel to come to rest is

A. 12 s

B. 24 s

C. 36 s

D. 48 s

Answer: D

Watch Video Solution

11. A particle is executing simple harmonic motion along a straight line PQ. At three points A, B and C on the line PQ, lying on one side of the mean position, the velocities of the particles are $8ms^{-1}, 7ms^{-1}$ and $4ms^{-1}$, respectively. If AB = BC = 1m, the velocity of the particle at mean position is

A. $9ms^{-1}$

B. $\sqrt{47}ms^{-1}$

C. $\sqrt{65}ms^{-1}$

D. $10ms^{-1}$

Answer: C

View Text Solution

12. The gravitational potential difference between the surface of a planet and a point 20 m above it is 16 J kg^{-1}. The work done in moving a 4 kg body by 8 m on a slope of 60° from the horizontal is

A. 22.17 J

B. 2.217 J

C. 221.7 J

D. 0.2217 J

Answer: A

Watch Video Solution

13. The area of cross-section of steel wire is $0.1cm^2$ and Young's modulus of steel is $2 \times 10^{11} N \quad m^{-1}$. The force required to stretched by 0.1% of its length is

A. 1000 N

B. 2000 N

C. 5000 N

D. 4000 N

Answer: B

Watch Video Solution

14. A sphere of radius R has a concentric spherical cavity of radius r. The relative density of the material of the sphere is σ. It just floats

when placed in tank full of water. The value of $\frac{R}{r}$ is

A. $\left(\frac{\sigma}{\sigma-1}\right)^{\frac{1}{3}}$

B. $\left(\frac{\sigma-1}{\sigma}\right)^{\frac{1}{3}}$

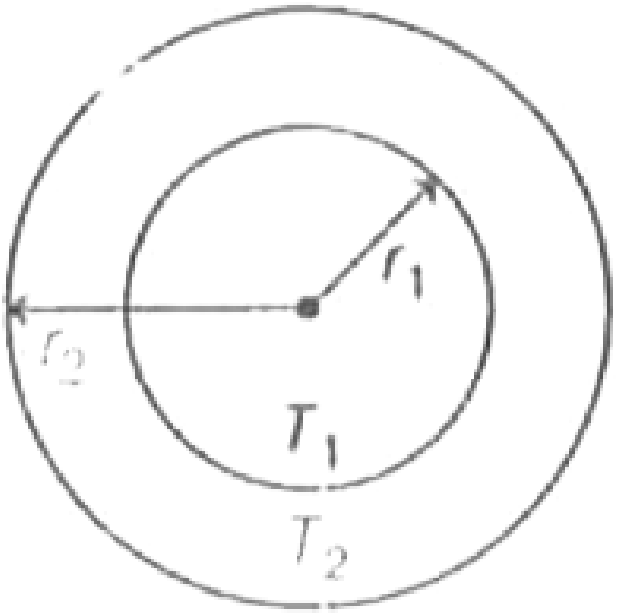
C. $\left(\frac{\sigma}{\sigma-1}\right)^{\frac{1}{2}}$

D. $\left(\frac{\sigma-1}{\sigma}\right)^{\frac{1}{2}}$

Answer: A

Watch Video Solution

15. Figure shows a system of two concentric spheres of radii r_1 and r_2 at the temperatures T_1 and T_2, respectively. The radial rate of flow of heat in a substance filled between the two concentric spheres is proportional to



A. $r_2 - r_1$

B. $\ln\left(\frac{r_2}{r_1}\right)$

C. $\frac{r_2 - r_1}{r_1 r_2}$

D. $\frac{r_1 r_2}{r_2 - r_1}$

Answer: D

Watch Video Solution

16. A composite bar of uniform cross-section is made of 25 cm of copper, 10 cm of nickel and 15 cm of aluminium with perfect thermal

contacts. The free copper end of the rod is at $100^\circ C$ and the free aluminium ends is at $0^\circ C$. If $K_{Cu} = 2K_{Al}$ and $K_{Al} = 3K_{Ni}$, then the temperatures of Cu-Ni and Ni-Al junctions are respectively.

(Assume no loss of heat occurs from the sides of the rod, K-thermal conductivity).

A. $82.3 \quad ^\circ C, 31.3 \quad ^\circ C$

B. $78.3 \quad ^\circ C, 26.1 \quad ^\circ C$

C. $70 \quad ^\circ C, 23.3 \quad ^\circ C$

D. $90.3 \quad ^\circ C, 30.1 \quad ^\circ C$

Answer: B

Watch Video Solution

17. The specific heat capacities of three liquids A, B and C are in the ratio, 1 : 2 : 3 and the masses of the liquids are in the ratio 1 : 1 : 1. The temperatures of the liquids A, B and C are $15\ ^\circ C, 30\ ^\circ C$ and $45\ ^\circ C$, respectively. Then matched the resultant temperature of the mixture given in list-II with the

corresponding mixture given in list-I.

	List I		List II
A.	Mixture of liquids *A* and *B*	(i)	25 °C
B.	Mixture of liquids *B* and *C*	(ii)	35 °C
C.	Mixture of liquids *C* and *A*	(iii)	37.5 °C
D.	Mixture of liquids *A*, *B* and *C*	(iv)	39 °C

A. $\begin{matrix} A & B & C & D \\ (\mathrm{i}) & (ii) & (iii) & (iv) \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ (\mathrm{ii}) & (i) & (v) & (iii) \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ (\mathrm{i}) & (iv) & (iii) & (ii) \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ (\mathrm{iv}) & (i) & (iii) & (ii) \end{matrix}$

Answer: C

Watch Video Solution

18. A gas $(\gamma = 1.5)$ undergoes a cycle of adiabatic, isobaric and isochoric processes in an order. If the volume of the gas is doubled in the adiabatic process then the efficiency of the cycle is approximately,

A. $18\ \%$

B. $46.4\ \%$

C. $38.5\ \%$

D. $9.25\ \%$

Answer: A

View Text Solution

19. The y-components of velocities of the molecules of a gas are

-7, -6, -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7

ms^{-1} then the rms velocity is

A. $\sqrt{\frac{56}{3}}ms^{-1}$

B. $\sqrt{\frac{28}{3}}ms^{-1}$

C. $\sqrt{\frac{112}{3}}ms^{-1}$

D. $\sqrt{\frac{84}{3}} ms^{-1}$

Answer: A

Watch Video Solution

20. A metal wire of length 80 cm, area of cross-section 3 mm^2 and material density 3000 kg m^{-3} is joined to another metal wire of length 60 cm, area of cross-sectional 1 mm^2 and material density 9000 $kg - m^3$.

The free ends of the two wires are stretched

between two rigid supports and a tension of 40 N is produced in the wires. The minimum frequency of the tuning fork which can produce stationary waves with the joint of the wires as a node is

A. $\frac{200}{3}$Hz

B. $\frac{400}{3}Hz$

C. $\frac{500}{3}Hz$

D. $\frac{70C}{3}Hz$

Answer: C

Watch Video Solution

21. A source producing sound of frequency 720 Hz is falling freely from the top of a tower of height 20 m. The frequency of sound heard by an observer on the top of the tower when the source just reaches the ground is (Acceleration due to gravity, $g = 10ms^{-2}$ and speed of sound in air $= 340ms^{-1}$)

A. 660 Hz

B. 680 Hz

C. 740 Hz

D. 760 Hz

Answer: B

Watch Video Solution

22. In a spherical glass marble of radius 6 cm, a small air bubble is formed at 1 cm from the centre of the marble. The apparent position of the air bubble from the nearest point on the

surface of the marble is about,

(refractive index of glass is 1.5.)

A. 3.3 cm

B. 4.6 cm

C. 5.4 cm

D. 7.0 cm

Answer: A

Watch Video Solution

23. In a Young's double slit experiment, the two slits are separated by 0.5 cm and the screen is at 0.5 m from the slits. If 20000 bright fringes are counted per meter on the screen, then the wavelength of light used is

A. $5000\overset{\circ}{A}$

B. $5890\overset{\circ}{A}$

C. $6000\overset{\circ}{A}$

D. $5460\overset{\circ}{A}$

Answer: A

Watch Video Solution

24. A dipole has two charges $+1\mu C$ and $-1\mu C$ and each of mass 1 kg. The separation between the charges is 1 m. An electric field $20 \times 10^3 Vm^{-1}$ is applied on the dipole. If the dipole is deflected through 2° from the equilibrium position, then the time taken by it to come to equilibrium position again is

A. $2.5\pi s$

B. $5\pi s$

C. $15\pi s$

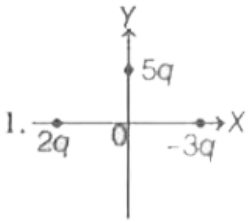
D. πs

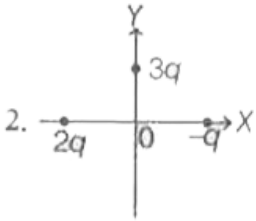
Answer: A

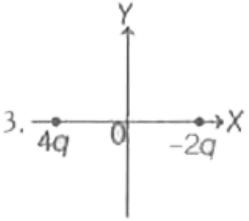
Watch Video Solution

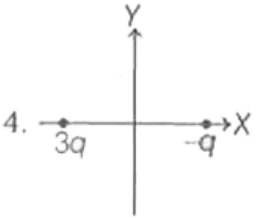
25. In the following four cases, charged particles are at equal distances from the origin. Arranged them in the descending order of magnitude of the net electric field at the

origin.









A. 1, 2, 3, 4

B. 2, 1, 3, 4

C. 1, 3, 2, 4

D. 4, 3, 2, 1

Answer: C

Watch Video Solution

26. An electrical technician requires a capacitance of $2\mu F$ in a circuit across a potential difference of $1kV$. A large number of $1\mu F$capacitors are available to him each of which can withstand a potential difference of not more than 400V. Suggest a possible arrangement that requires the minimum number of capacitors.

A. 24

B. 32

C. 8

D. 16

Answer: B

 Watch Video Solution

27. A charge 5C is placed at the centre of shell of radius, r = 3 m and having charges 5 C. The

potential at a point $\frac{r}{2}$ distance from the centre of the shell will be

A. $-9 \times 10^9 V$

B. $30 \times 10^9 V$

C. $45 \times 10^9 V$

D. $-15 \times 10^9 V$

Answer: C

Watch Video Solution

28. Electrical energy costs 25 paisa per kilowatt hour. Assuming that no energy is wasted, the cost of heating 4.6 kg of water from $25^{\circ}C$ to the boiling point is

A. 25 paisa

B. 50 paisa

C. 20 paisa

D. 10 paisa

Answer: D

Watch Video Solution

Watch video solution

29. A 500 W heater is designed to operate at 200 V potential difference. If it is connected across 160 V line, the heat it will produce in 20 minutes is

A. 384 kJ

B. 483 kJ

C. 843 kJ

D. 348 kJ

Answer: A

Watch Video Solution

30. A wire of length 44 cm carrying a current of 2 A is bent and the two ends are joined. This shape is placed in a uniform magnetic field of 50 mT. If the magnetic field in North-South direction, then the maximum torque acting on the shape is

A. $1.54 \times 10^{-3} Nm$

B. $0.77 \times 10^{-3} Nm$

C. $3.08 \times 10^{-3} Nm$

D. Zero

Answer: A

 Watch Video Solution

31. A toroid has a non-ferromagnetic core of inner radius 20.5 cm and outer radius 21.5 cm, around which 4200 turns of a wire are wound. If the current in the wire is 10 A, the magnetic

field inside the core of the toroid is $(\mu_0 = 4\pi \times 10^{-7} Hm^{-1})$

A. 20 mT

B. 40 mT

C. 20 π mT

D. 40 π mT

Answer: B

Watch Video Solution

32. Two short bar magnets A and B are arranged co-axially. The distance between their centres is 30 cm. A compass needle placed on their axis at a distance of 6 cm from B shows no deflection. The ratio of the magnetic moments of A and B is

A. $16:1$

B. $1:16$

C. $64:1$

D. $1:64$

Answer: C

Watch Video Solution

33. A circular coil of area 0.1 m^2 having 200 turns is placed in a magnetic field of 40 T. The plane of the coil makes 30° with the field. If the field is removed for 0.1 s then the induced emf in the coil is

A. 4000 V

B. $4000\sqrt{3}V$

C. 2000 V

D. $2000\sqrt{3}V$

Answer: B

Watch Video Solution

34. A coil has an inductance 0.7 H and it is joined in series with a resistance of 220 Ω. When AC of 220 V, 50 Hz is applied to it, then wattles component in the circuit is

A. $5A$

B. $0.5A$

C. $0.7A$

D. $7A$

Answer: B

Watch Video Solution

35. A plane electromagnetic wave propagating in a non-magnetic dielectric medium is given by $E = E_0\left[4 \times 10^{-7}x - 50t\right]$, where x is in

metre and t is in second. If the relative permeability of the medium, $\mu_r = 1$ then the dielectric constant of the medium is

A. 2.42

B. 5.76

C. 8.26

D. 4.84

Answer: B

Watch Video Solution

36. All electrons ejected from a metal surface by the incident light of wavelength 200 nm can be stopped before travelling 1 m in the direction of uniform electric field of $4NC^{-1}$. The work function of the metal surface is

A. 2 eV

B. 2.2 eV

C. 4 eV

D. 6.2 eV

Answer: B

Watch Video Solution

37. A hydrogen atom emits a photon of wavelength $\frac{36}{35R}$ when it is jumped from its nth excited state to the ground state. Then the quantum number n is

(R is Rydberg constant.)

A. 8

B. 7

C. 5

D. 6

Answer: D

Watch Video Solution

38. Assertion (A) Fragments produced in the fission of $_{92}U^{235}$ are radioactive.

Reason (R) The fragments in the fission of ^{235}U have a proton to neutron ratio of 2.5.

A. Both (A) and (R) are correct and (R) is the correct explanation of (A).

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A).

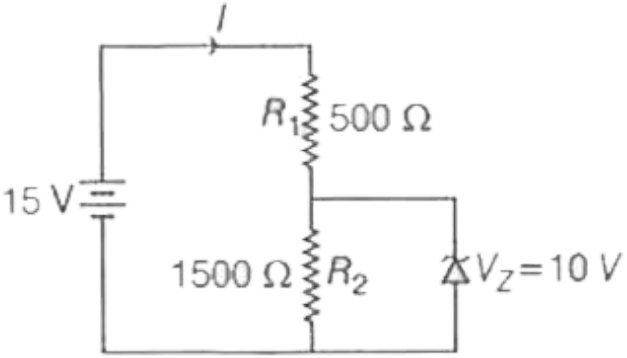
C. (A) is correct but (R) is not correct.

D. (A) is not correct but (R) is correct.

Answer: C

Watch Video Solution

39. In the circuit given, the current through Zener diode is



A. 10 mA

B. 6.67 mA

C. 3.33 mA

D. 5 mA

Answer: C

Watch Video Solution

40. Co-axial cable, a widely used wire medium for transmission of signals offers a bandwith of approximately.

A. 600 kHz

B. 750 MHz

C. 850 GHz

D. 500 Hz

Answer:

Watch Video Solution