TS EAMCET Physics Previous Questions with Key – Test 3

81)Choose the incorrect statement from the following

1)strong nuclear force is short range force

2)Weak nuclear force is weakest among gravitational, electromagnetic, weak and strong

3)Electromagnetic force is a long range force

4)Gravitational force acts on all objects

82)If V_0 is the volume of a standard unit cell of Germanium crystal containing N_0 atoms, the expression for the mass 'm' of a volume 'V' in terms of V_0, N_0, M_{mol} and N_A is [Here M_{mol} is the molar mass of Germanium and N_A is the Avogadro's constant]

1) $M_{mol}\frac{V}{V_0}\frac{N_A}{N_0}$

2) $\frac{N_A}{N_0}\frac{V_0}{V}M_{mol}$

3) $M_{mol}\frac{V}{V_0}\frac{N_0}{N_A}$

4) $M_{mol}\frac{V_0}{V}\frac{N_0}{N_A}$

83)A stone is dropped from a height of 100m while another one is project vertically upwards from the ground with a velocity of 25 m/s at the same time. The time in seconds after which they will have the same height is (acceleration due to gravity g = $10^{ms\text{-}2}$)

1)4 2)5 3)6 4)7

84)A cart starts from rest and moves with a constant acceleration of 5 m/s^2 for 10 seconds before the driver applies the brake. It then decelerates for 5 seconds before coming to rest. The average speed of the car over the entire journey of the car is

1)23 m/s

2)30 m/s

3)33 m/s

4)25 m/s

85)A particle moves in a circle with speed v varying with time as v(t) = 2t. The total acceleration of the particle after it completes 2 rounds of cycle is

1)16π

2) $2\sqrt{1+6\pi^2}$

3) $2\sqrt{1+49\pi^2}$

4)14π

86)A small object is thrown at an angle 45° to the horizontal with an initial velocity $\vec{v}_0$. The velocity is averaged for √2 s. and the magnitude of average velocity comes out to be same as that of initial velocity. i.e. $|\vec{v}_0|$. The magnitude $|\vec{v}_0|$ will be

(Take g = 10 m/s^2)

1)3 m/s

2)3√2 m/s

3)4 m/s

4)5 m/s

87)Consider a wheel rotating around a fixed axis. If the rotation angle 'θ' varies with time as $\theta = at^2$, the total acceleration of a point A on the rim of the wheel is (v being the tangential velocity)

1) $\frac{v}{t}\sqrt{1+4a^2t^4}$

2) $\frac{v}{t}$

3) $\frac{v}{t}(1+4a^2t^4)$

4) $\sqrt{(1+4a^2t^4)}$

88)A block of mass '4 m' travelling at a velocity v_1 in X-direction on a frictionless horizontal plane makes a head –on collision with another block of mass '2 m' travelling in opposite direction with a velocity v_2. After collision both the blocks travel as a single block along X-direction with a final velocity $5v_2$. The ratio of velocities $\frac{v_1}{v_2}$ is

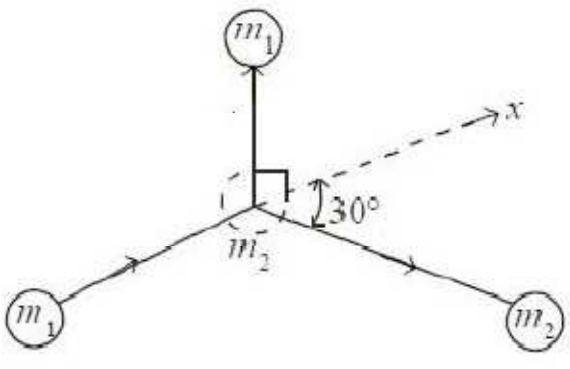
1)2

2)3

3)5

4)8

89)A particle of mass 'm_1' moving along the X-axis collides with a stationary particle of mass m_2 and deviates by an angle 30° to the X-axis as shown in the figure. If the percentage change in kinetic energy the combined system of these two particles reduces by 50%, the ratio of the masses $\frac{m_2}{m_1}$ is



1)8

2)6

3) $\frac{8}{7}$

4) $\frac{1}{6}$

90)Collision takes place between two solid spheres denoted as 1 and 2. The initial velocities of the spheres are u_1 = 3 m/s and u_2 = 1.5 m/s and the final velocities are v_1 = 2.5 m/s and v_2 = 3.5 m/s. The coefficient of restitution between the material of the spheres is nearly

1)0.67

2)0.78

3)0.83

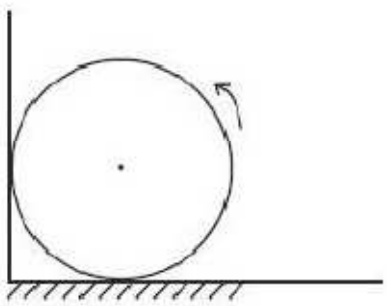
4)0.96

91)A 30 kg boy stands at the far edge of a floating plank whose near edge is against the shore of a river. The plank is 10 m long and weighs 10 kg. If the boys walks to the near edge of the plank, how far from the shore does the plank move

1)7m 2)8m 3)7.5m 4)15m

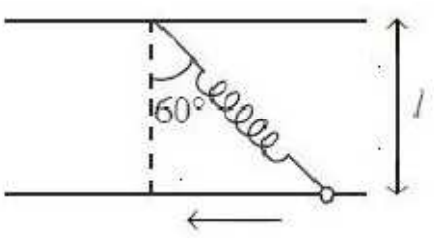
92)A uniform cylinder of radius 1m, mass 1 kg spins about its axis with an angular velocity 20 rad/sec. At certain moment the cylinder is placed into a corner as shown in the figure. The coefficient of friction between the horizontal wall and the cylinder is μ, where as the vertical wall is frictionless. If the number of rounds made by the cylinder is 5 before it stops, the value of μ is:

(Acceleration due to gravity g = 10m/sec^2)



1) $\frac{3}{\pi}$ 2) $\frac{2}{\pi}$ 3) $\frac{1}{\pi}$ 4) $\frac{0.4}{\pi}$

93)A spring has a natural length l with one end fixed to the ceiling. The other end is fitted with smooth ring which can slide on a horizontal rod fixed at distance l below the ceiling. Initially the spring make an angle of 60° with vertical when system is released from rest. Find the angle of the spring with the vertical when the velocity of the ring reaches half of the maximum velocity which the ring can attain during the motion



1)30° 2) $\cos^{-1}\left(\frac{2}{2+\sqrt{3}}\right)$ 3) $\cos^{-1}\left(\frac{\sqrt{3}-1}{2}\right)$ 4)45°

94)From the pole of the earth, a body of mass 'm' is imparted a velocity 'v_0' directed vertically up. If 'M' is the mass of the earth. 'R' its radius and 'g' free-fall acceleration on its surface, the height 'h' to which the body will ascent is (neglect air resistance)

1) $\frac{Rv_0^2}{(2gR - v_0^2)}$

2) $\frac{Rv_0^2}{2gR}$

3)R

4) $\frac{Rv_0^2}{(2gR + v_0^2)}$

95)Young's modulus experiment is performed on a steel wire of 1 m length and 8 mm diameter. The mass required to be added in the experiment to produce 5mm elongation of the wire is ($Y_{steel} = 2 \times 10^9$ Nm^{-2}, g= 10 m/s^2)

1)25 kg

2)50 kg

3)250 kg

4)500 kg

96)What is the rate at which a trapped bubble of 2.0 mm diameter rises slightly through a solution of density 13.6×10^3 kg/m^3 and coefficient of viscosity 1.5 centi poise. Assume the density of air negligible and g = $10m/s^2$

1)20m/s 2)2 m/s 3)0.2 m/s 4)0.02 m/s

97)An electric heater with constant heat supply rate is used to convert a certain amount of liquid ammonia to saturated vapour a high pressure. The heater takes 14 minutes to bring the liquid at 15 °C to the boiling point of 50 °C and 92 minutes to convert the liquid at the boiling point wholly to vapour. If the specific heat capacity of liquid ammonia is 4.9 KJ/kg K, the latent heat of vaporization of ammonia in KJ/kg is

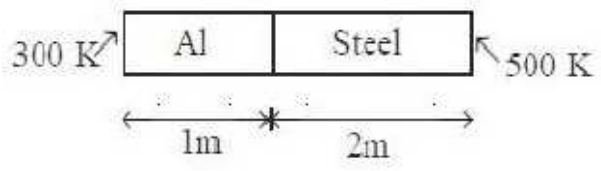
1)557

2)981

3)1127

4)2250

98)An aluminium rod of length 1 m and a steel rod of length 2 m both having same cross sectional area, are soldered together end-to-end. The thermal conductivity of aluminium rod and steel rod is 200J s^{-1} m^{-1} and 5- J^{s-1} K^{-1} respectively. The temperatures of the free ends are maintained at 300 K and 500 K. What is the temperature of the junction?



1)322K

2)350K

3)367K

4)400K

99)One mole of the ideal gas goes through the process $P = P_0\left[1-\alpha\left(\frac{V}{V_0}\right)^3\right]$, where P and V are pressure and volume, P_0, V_0 and α are constants. If the maximum attainable temperature of the gas is $\left(\frac{3}{4}\right)\frac{P_0V_0}{R}$, then the value of α is:

1)2

2)½

3)¼

4)4

100)A gas mixture contains n_1 moles of a monatomic gas and n_2 moles of gas of rigid diatomic molecules, Each molecule in monatomic and diatomic gas has 3 and 5 degrees of freedom respectively. If the adiabatic exponent $\left(\frac{C_p}{C_v}\right)$ for this gas mixture is 1.5, the ratio $\frac{n_1}{n_2}$ will be

1)1

2)1.5

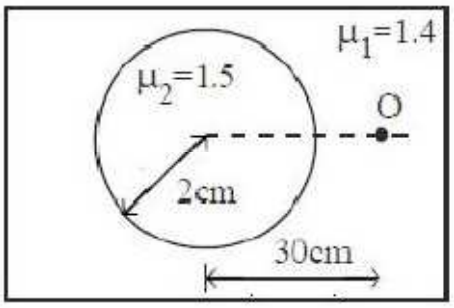
3)2

4)2.5

101)A wire of length 50 cm and weighing 10 gm is attached to a spring at one end and to a fixed wall at the other end. The spring has a spring constant of 50 N/m and is stretched by 1 cm. If a wave pulse is produced on the string neat the wall, how much time will it make to reach the spring

1)0.1 s 2)0.2 s 3)0.3 s 4)0.4 s

102)Consider a point object situated at a distance of 30 cm form the centre of sphere of radius 2 cm and refractive index 1.5 as shown in the figure. If the refractive index of the region surrounding this sphere is 1.4, the position of the image due to refraction by sphere with respect to the centre is



1)30 cm

2)45 cm

3)∞

4)28 cm

103)At what distance form a biconvex lens of the focal length F, must be placed an object for the distance between the object and its real image to be minimal

1)2F

2)F

3) $\frac{F}{2}$

4)4F

104)In an experiment, light passing through two slits separated by a distance of 0.3 mm is projected onto a screen placed at 1 m form the plane of slits. It is observed that the distance between the central fringe and the adjacent bright fringe is 1.9 mm. The wavelength of light in nm is

1)450

2)495

3)530

4)570

105)A solid sphere of radius r_1 = 1 cm carries charge distributed uniformly over it with density ρ_1 = -3 C/cm^3. It is surrounded by a concentric spherical shell of radius r_2 = 2 cm carrying uniform charge density $\rho_{2=}$ = ½ C/cm^2. If E_d denotes the magnitude of the electric filed at distance d form the common centre of the spheres, then

1) $E_d = \frac{1}{3\varepsilon_0 d^2}, d \le 1\,cm$ 2) $E_d = \frac{1}{\varepsilon_0 d^2}, d \le 1\,cm$

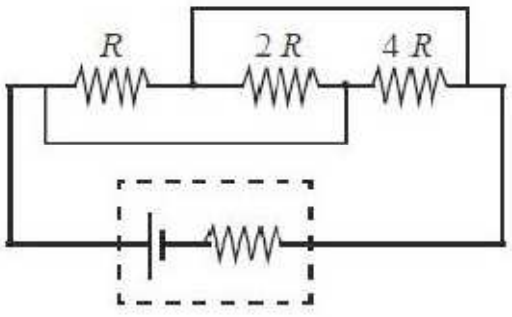
3) $E_d = \frac{d}{3\varepsilon_0}, d \le 1\,cm$ 4) $E_d = \frac{d}{\varepsilon_0}, d \le 1\,cm$

106)Two isolated, concentric, conducting spherical shells have radii R and 2 R and uniform charges q and 2q respectively. If V_1 and V_2 are potentials at points located at distances 3 R, and $\frac{R}{2}$, respectively, from the center of shells, then ratio $\left(\frac{V_2}{V_1}\right)$ will be

1)2 2)1

3)½ 4)0

107)A battery with internal resistance of 4Ω is connected to a circuit consisting three resistances R, 2 R and 4R (see following figure). If the power generated in the circuit is highest, then the magnitude of R must be



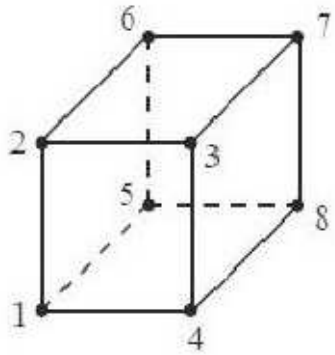
1)4Ω

2)7Ω

3)10Ω

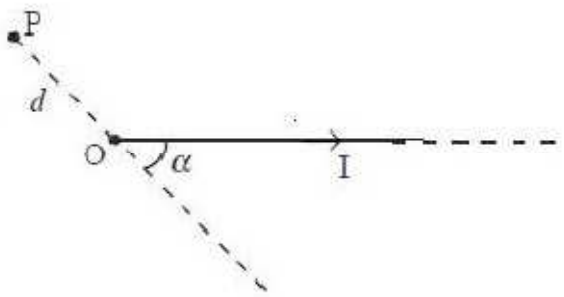
4)14Ω

108)If the resistance of each edge of a cube shaped wire frame shown in figure below is R, the resistance between points 1 and 7 is



1) $\frac{5R}{6}$ 2) $\frac{R}{6}$ 3)5R 4) $\frac{6}{5}$R

109)A steady current I flows through a wire with one end at O and the other end extending upto infinity as shown in the figure. The magnetic field at a point P, located at a distance 'd' from O is



1) $\frac{\mu_0 I}{4\pi d\cos\alpha}(1-\sin\alpha)$

2) $\frac{\mu_0 I}{2\pi d\cos\alpha}(1-\sin\alpha)$

3) $\frac{\mu_0 I}{4\pi d}$

4) $\frac{\mu_0 I}{4\pi d\sin\alpha}(1-\cos\alpha)$

110)The magnetic induction at point 'O' of the given infinitely ling current carrying wire shown in the figure below is

1) $\frac{\mu_0 I}{4\pi R}\left(1-\frac{3\pi}{2}\right)$

2) $\frac{\mu_0 I}{2R(1+\pi)}$

3) $\frac{\mu_0 I}{4\pi R}\left[1+\frac{3\pi}{2}\right]$

4) $\frac{\mu_0 I}{4\pi R}$

111)At a location, the horizontal component of the Earth's magnetic field is 0.3 G in the magnetic meridian and the dip angle is 60°. The earth's magnetic field at this location in G is

1)0.3

2)0.6

3)0.9

4)1.2

112)A rectangular loop of wire is placed in the XY plane with its side of length 3 cm parallel to the X-axis and the side of length 4 cm parallel to Y – axis. It is moving in the positive X direction with the speed 10 cm/sec. A magnetic field exists in the space with its direction parallel to the Z-axis. The field decreases by 2×10^{-3} T/cm along the positive X- axis and increases in time by 2×10^{-2} T/sec. The induced emf in the wire is

1)-4.8×10^{-5} V 2)4.8×10^{-5} V

3)0 4)3.6×10^{-5} V

113)A coil has inductance of 0.4 H and resistance of 8 Ω. It is connected to an AC source with peak emf 4 V and frequency $\frac{30}{\pi}$ Hz. The average power dissipated in the circuit is:

1)1 W 2)0.5 W

3)0.3 W 4)0.1 W

114)A laser beam is operating at 100 mW. The amount of energy stored by 90 cm length of this laser beam will be

1)2×10^{-10} J 2)3×10^{-10} J

3)8×10^{-11} J 4)6×10^{-11} J

115)A photon of energy 4 eV imparts all its energy to an electron that leaves a metal surface with 1.1 eV of kinetic energy. The work function of the metal is

1)2.9 eV

2)5.1eV

3)3.64 eV

4)4.4 eV

116)Consider an electron revolving in a circular orbit of hydrogen atom whose quantum number n =2. The velocity of the electron in that orbit is

1)1.1 $\times 10^6$ m/s

2)2.2 $\times 10^7$ m/s

3)4.4$\times 10^6$ m/s

4)2.2 $\times 10^5$ m/s

117)The half –life of $^{209}_{84}P_0$ is 103 years. The time it takes for 100g sample of $^{209}_{84}P_0$ to 3.125 g is

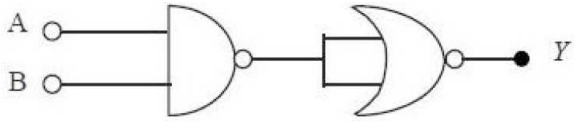
1)3296 years

2)103$\sqrt{2}$ years

3)1648 years

4)515 years

118)The logic operation performed by the following circuit is



1)NOR

2)AND

3)NAND

4)OR

119)Which of the following statements is true?

1)A solid is an insulator or semiconductor if its conduction ban is partially filled

2)A solid is necessarily an insulator if its conduction ban is empty

3)A solid is necessarily a semiconductor if its conduction ban is empty

4)A solid is conductor if its conduction band is partially filled

120)A transmitting and receiving antenna have height of ‘d’ meters each. The maximum distance between them for satisfactory communication in Line- of – Sight mode (LOS) is 2 d kilometers. If the radius of earth is 6400 km, then the value of d is

1)3.2 m 2)6.4 m

3)12.8 m 4)16.0 m

TS EAMCET 2018 Engineering Stream Final Key Date: 05-05-2018 FN (Shift 1)	
81	2
82	3
83	1
84	4
85	2
86	4
87	1
88	4
89	1
90	1
91	3
92	3
93	2
94	1
95	2
96	1
97	3
98	1
99	3
100	1
101	1
102	1
103	1
104	4
105	4
106	1
107	2
108	1
109	4
110	3
111	2
112	3
113	4
114	2
115	1
116	1
117	4
118	2
119	4
120	3