AP EAMCET Physics Previous Questions with Key – Test 7

81)In a system, units of mass is Akg, length is Bm and times is C s, then the value of 10 N in this system is

1)$10A^{-1}B^{-1}C^{-2}$

2)$10A^{-1}B^{-1}C^{2}$

3)$10ABC^{-2}$

4)$5A^{-1}BC^{2}$

82)Assertion (A): The angle between acceleration and velocity of a body in one dimensional motion is always zero.

Reason (R): One dimensional motion is along a straight line.

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

2)Both (A) and (R) are true but (R) is not the correct explanation of (A)

3)(A) is true but (R) is false

4)(A) is false but (R) is true

83)A projectile is given an initial velocity of $\left(\hat{i}+2\hat{j}\right)ms^{-1}$. The equation of its path is (g= $10ms^{-2}$)

1)$y = 2x - 5x^2$

2)$y = x - 5x^2$

3)$4y = 2x - 5x^2$

4)$y = 2x - 25x^2$

84)A body projected with some velocity at an angle 45° with the horizontal from the origin in X-Y plane passes through a point at (4, 3)m. Its horizontal range is

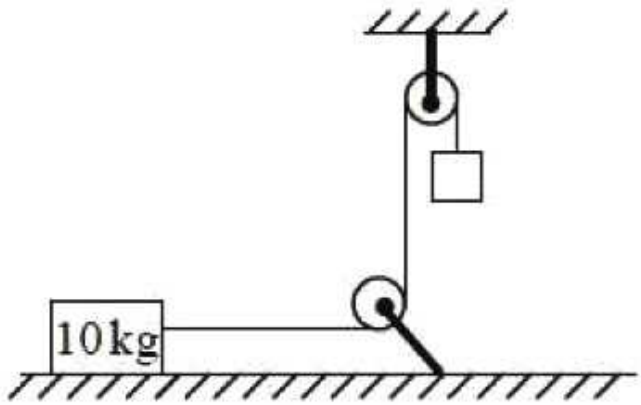
1)10m

2)14m

3)18m

4)16m

85)A block of mass 10kg is placed on a horizontal frictionless surface and is attached to a cord which passes over two light frictionless pulleys as shown in the figure. The hanging block tied to the other end of the cord is initially at rest 2m above the horizontal floor. If the hanging block strikes the floor 2s after the system is released, the weight of the hanging block is _____(g= 10ms^{-2})



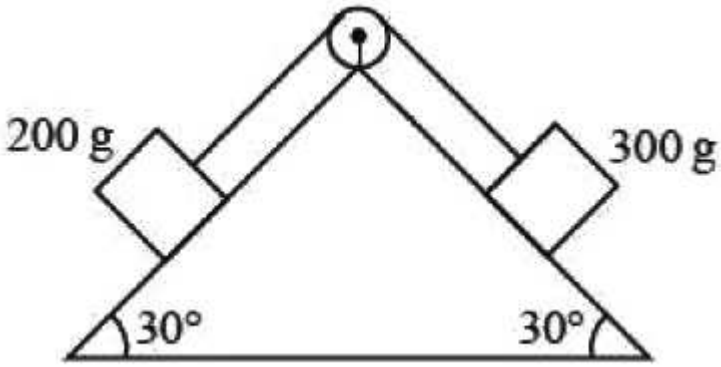
1)22.22N

2)11.11N

3)1.11N

4)2.22N

86)A double inclined plane as shown in the figure has fixed horizontal base and smooth faces with the same angle of inclination of 30°. A block of mass 300g is on one face and is connected by a cord passing over a frictionless pulley to a second block of mass 200g kept on another face. The acceleration with which the system of the blocks moves is _____ % of acceleration due to gravity.



1)5

2)10

3)15

4)20

87)A canon shell fired breaks into two equal parts at its highest point. If one part retraces the path to the canon with kinetic energy E_1 and kinetic energy of the second part is E_2 then

1)$E_2 = 15E_1$

2)$E_2 = E_1$

3)$E_2 = 4E_1$

4)$E_2 = 9E_1$

88)A uniform chain of mass 'm' and length 'l' is on a smooth horizontal table with $\left(\frac{1}{n}\right)^{th}$ part of its length is hanging from one end of the table. The velocity of the chain when it completely slips off the table is

1)$\sqrt{gl\left(1-\frac{1}{n^2}\right)}$

2)$\sqrt{2gl\left(1+\frac{1}{n^2}\right)}$

3)$\sqrt{2gl\left(1-\frac{1}{n^2}\right)}$

4)$\sqrt{2gl}$

89)Two particles of masses in the ratio 1:2 are placed along a vertical line. The lighter particle is raised through a height of 9cm. To raise the centre of mass of the system by 2cm, the heavier particle should be_____

1)moved 1.5cm downward

2)moved 2cm upward

3)moved 1.5cm upward

4)moved 2cm downward

90)A solid sphere and a ring of same radius roll down an inclined plane without slipping. Both start from rest from the top of the inclined plane. If the sphere and the ring reach the bottom of the inclined plane with velocities V_s and V_r respectively, then $\frac{V_r^2}{V_s^2}$ is

1)0.2

2)0.5

3)0.7

4)0.9

91)A particle is executing S.H.M. The time taken for $\left(\frac{3}{8}\right)^{th}$ of oscillation from extreme position is 'X'. Then the time taken for the particle to complete $\left(\frac{5}{8}\right)^{th}$ of oscillation from mean position is

1) $\frac{5X}{4}$

2) $\frac{7X}{4}$

3) $\frac{21X}{8}$

4) $\frac{7X}{12}$

92)An object is thrown vertically upwards from the surface of the earth with a velocity x times the escape velocity on the earth (x < 1), the maximum height to which it rises from the centre of the earth is
(radius of earth is R)

1)$R(1-x^2)$ 2) $\frac{R}{\left(1-x^2\right)}$

3) $\frac{1-x^2}{R}$ 4) $\frac{x^2}{1-R}$

93)A sphere of mass 2kg and diameter 4.5cm is attached to the lower end of a steel wire of 2m length and area of cross section $0.24 \times 10^{-6} m^2$. The wire is suspended from 205cm high ceiling of a room. When the system is made to oscillate as a simple pendulum, the sphere just grazes the floor at its lowest position. The velocity of the sphere at the lowest position is (Young's modulus of steel = $2 \times 10^{11} Nm^{-2}$ and acceleration due to gravity = $10 ms^{-2}$)

1)10 ms^{-1}

2)12 ms^{-1}

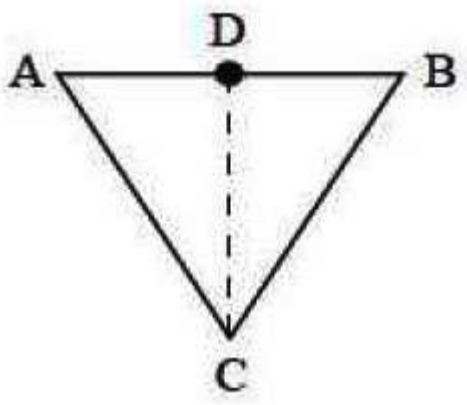
3)15 ms^{-1}

4)18 ms^{-1}

94)A spherical body of density ρ is floating half immersed in a liquid of density d. If σ is the surface tension of the liquid, then the diameter of the body is

1) $\sqrt{\frac{3\sigma}{g(2\rho-d)}}$ 2) $\sqrt{\frac{6\sigma}{g(2\rho-d)}}$ 3) $\sqrt{\frac{4\sigma}{g(2\rho-d)}}$ 4) $\sqrt{\frac{12\sigma}{g(2\rho-d)}}$

95)As shown in the figure, an equilateral triangle ABC is formed by joining three rods of equal lengths and D is the midpoint of AB. Coefficient of linear expansion of the material of AB is α_1 and that of AC and BC is α_2. If the length DC remains constant for small changes in temperature, then



1)$\alpha_1 = \alpha_2$ 2)$\alpha_1 = 4\alpha_2$ 3)$\alpha_2 = 4\alpha_1$ 4) $\alpha_1 = \frac{\alpha_2}{2}$

96)Match the following List-I with List – II.

List – I	List – II
A) When ice melts into water	I) Volume increases
B) When water changes into steam	II) Volume decreases
C) Melting point of ice	III) Increases with increases of pressure
D) Boiling point of water	IV) Decreases with increases of pressure

The correct answer is

1)A – I; B – II; C – III; D - IV

2)A – II; B – I; C – IV; D - III

3)A – III; B – II; C – IV; D - I

4)A – II; B – I; C – III; D - IV

97)A cylindrical vessel of uniform cross section consisting of a gas of $\gamma = 1.5$ is divided into two parts A and B using a piston. Initially the piston is kept fixed such that part A has pressure P and volume 5V and the part B has pressure 8P and volume V. If the piston is let free and the gas is allowed to undergo adiabatic process, the final volume of the gas in part A is _____

1)3V

2)$\frac{8}{3}V$

3)$\frac{10}{3}V$

4)$\frac{13}{3}V$

98)A diatomic ideal gas is used in Carnot's engine as working substance. During adiabatic expansion of the cycle, if the volume of the gas increases from V to 32V then the efficiency of the engine is

1)0.25 2)0.5 3)0.67 4)0.75

99)The absolute temperature at which the rms speed of hydrogen molecule is equal to its escape speed from the Moon's surface is
(radius of Moon is R, g is acceleration due to gravity on Moon's surface, m is mass of hydrogen molecule and k is Boltzmann constants)

1) $\frac{mgR}{2k}$

2) $\frac{2mgR}{k}$

3) $\frac{3mgR}{2k}$

4) $\frac{2mgR}{3k}$

100)An object of density 2000 kgm^{-3} is hung from a thin light wire. The fundamental frequency of the transverse waves in the wire is 200 Hz. If the object is immersed in water such that half of its volume is submerged, then the fundamental frequency of the transvers waves in the wire is _____

1)200.0 Hz

2)173.2 Hz

3)100.0 Hz

4)141.4 Hz

101)An observer and a source emitting sound of frequency 120Hz are on the X-axis. The observer is stationary while the source of sound is in motion given by the equation x= 3 sinωt (x in metres and t in seconds). If the difference between the maximum and minimum frequencies of the sound observed by the observer is 22Hz, then the value of ω is (Speed of sound in air = $330ms^{-1}$)

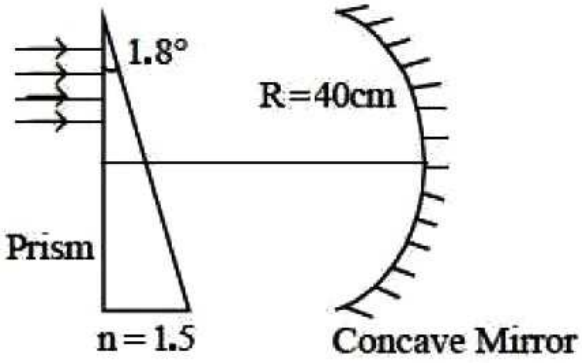
1)33 rad s^{-1}

2)36 rad s^{-1}

3)20 rad s^{-1}

4)10 rad s^{-1}

102)As shown in the figure, a parallel beam of light incidents on the upper part of a prism of angle 1.8° and material of refractive index 1.5. The light emerging out from the prism falls on a concave mirror of radius of curvature 40cm. The distance of the point from the principal axis of the mirror where the light rays are focused after reflection from the mirror is



1)4.76 cm

2)1.57 mm

3)3.14 mm

4)6.28 mm

103)A microscope has an objective of aperture 8mm and focal length of 5cm. The minimum separation between two objects to be just resolved by the microscope is

(Wavelength of light used = 5500 $\overset{o}{A}$)

1)2.2μm

2)3.4μm

3)4.2μm

4)3.6μm

104)The electric field due to a short electric dipole at a distance 'r' on the axial line from its mid point is x times the electric field at a distance 2r on the equatorial line from the mid point of the dipole. Then the value of x is

1)16 2)9 3)25 4)36

105)A point charge 'q' is placed at origin. Let $\vec{E}_A, \vec{E}_B$ *and* $\vec{E}_C$ be the electric fields at three points A(1, 2, 3). B(1, 1, -1) and C(2, 2, 2) respectively due to the charge 'q'. Then the relation between them is

a) $\vec{E}_A \perp \vec{E}_B$ b) $\vec{E}_A \| \vec{E}_C$ c) $|\vec{E}_B| = 4|\vec{E}_C|$ d) $|\vec{E}_B| = 8|\vec{E}_C|$

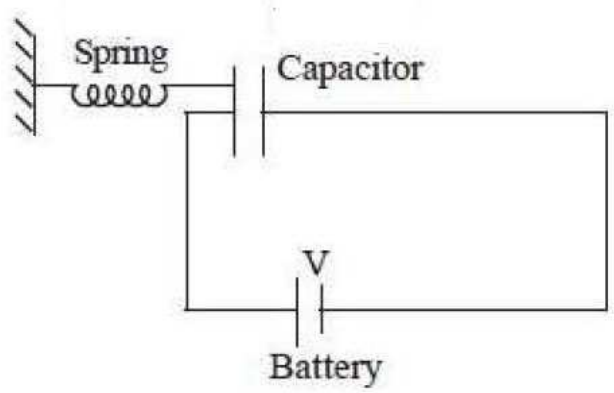
1)a, d are correct 2)b, d are correct

3)a, c are correct 4)b, c are correct

106)An electric dipole consists of two particles each of mass 1kg separated by 1m carrying charges 1μC and -1μC respectively. It is in equilibrium in a uniform electric field of 2×10^4 Vm-1. If it is deflected by a small angle 2°, minimum time taken by it to come back again to the mean position is (in seconds)

1)2.5π 2)2π 3)5π 4)4π

107)One plate of a parallel plate capacitor is connected to a spring as shown in the figure. The area of each plate of the capacitor is A and the distance between the plates is d when the battery is not connected and the spring is unstretched. After connecting the battery, in the steady state, the distance between the plates is 0.75d, then the force constant of the spring is



1) $\frac{3}{8}\frac{\epsilon_0 V^2 A}{d^3}$ 2) $\frac{8}{3}\frac{\epsilon_0 V^2 A}{d^3}$

3) $\frac{9}{32}\frac{\epsilon_0 V^2 A}{d^3}$ 4) $\frac{32}{9}\frac{\epsilon_0 V^2 A}{d^3}$

108)Two cells P and Q each of emf 2.16V are connected in series with a resistor of 19.6Ω. An ideal voltmeter reads 2V when connected across the cell P and 1.92V when connected across the cell Q. The ratio of the internal resistances of the cells P and Q is

1)1 : 2

2)2 : 3

3)3 : 4

4)1 : 3

109)A resistor has bands with colours orange, green, silver and gold. Then the resistance of the resistor is

1)(350 ± 5) mΩ

2)(350 ± 17.5) mΩ

3)(35 ± 5%) mΩ

4)(250 ± 5%) mΩ

110)A beam of protons enters a uniform magnetic field of 0.314 T with a velocity 4×10^5 ms^{-1} in a direction making an angle 60° with the direction of the magnetic field. The path of the beam is (mass of proton = 1.6×10^{-27} kg)

1)a circle of radius 0.2m

2)a straight line

3)a helix with a pitch 4cm

4)a helix with a pitch 4mm

111)The magnetic field due to a current carrying loop of radius 3cm at a point on its axis at a distance of 4cm from its centre is 54μT. Then the value of the magnetic field at the centre of the loop is _____

1)250 μT

2)150 μT

3)75 μT

4)125 μT

112)A short bar magnet of magnetic moment 0.21 Am^2 is placed with its axis perpendicular to the direction of the horizontal component of the Earth's magnetic field. The distance of the point on the axis of the magnet from the centre of the magnet where the resultant magnetic field is inclined at 45° with the horizontal component of the Earth's filed direction is _____

(Horizontal component of the Earth's magnetic field = 4.2×10^{-5} T)

1)12 cm

2)20 cm

3)5 cm

4)10 cm

113)The length of a wire required to make a solenoid of length 'l' and self induction 'L' is

1) $\sqrt{\frac{4\pi Ll}{\mu_0}}$

2) $\sqrt{\frac{Ll}{4\pi\mu_0}}$

3) $\sqrt{\frac{2\pi Ll}{\mu_0}}$

4) $\sqrt{\frac{\mu_0 Ll}{4\pi}}$

114)An inductor and a resistor are connected in series to an ac source. The current in the circuit is 500 mA if the applied ac voltage is $8\sqrt{2}\text{V}$ at a frequency of $\frac{175}{\pi}\text{Hz}$ and the current in the circuit is 400 mA if the same ac voltage at a frequency of $\frac{225}{\pi}\text{Hz}$ is applied. The values of the inductance and the resistance are respectively

1)60 mH, 71 Ω

2) $\sqrt{60}\,\text{mH}, 71\ \Omega$

3) $\sqrt{60}\,\text{mH}, \sqrt{71}\ \Omega$

4) $60\,\text{mH}, \sqrt{71}\ \Omega$

115)An electromagnetic wave of frequency 2 MHz propagates from vacuum to a non-magnetic medium of relative permittivity 9. Then its wavelength

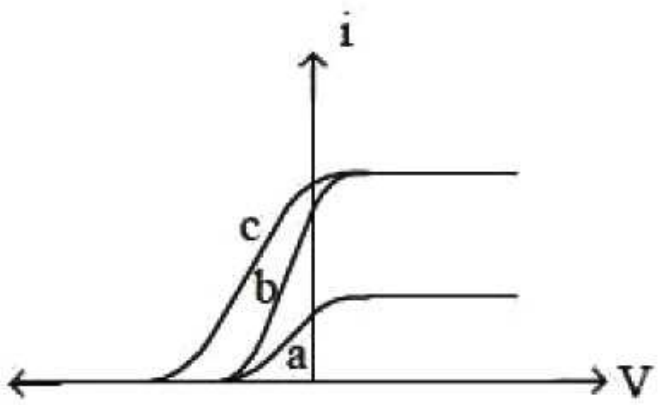
1)Increases by 100 m

2)Increases by 50 m

3)Decreases by 50 m

4)Decreases by 100m

116)The figure shows the variation of photocurrent (i) with anode potential (V) for three different radiations. Let I_a, I_b and I_c be the intensities and f_a, f_b and f_c be the frequencies for the curves a, b and c respectively. Then



1)$f_a = f_b$ and $I_a \neq I_b$

2)$f_a = f_c$ and $I_a = I_c$

3)$f_a = f_b$ and $I_a = I_b$

4)$f_b = f_c$ and $I_b = I_c$

117)A stationary hydrogen atom undergoes a transition from n= 5 to n= 4, Recoil speed of the atom is (R = Rydberg constant, h= Planck's constant, m= mass of the proton).

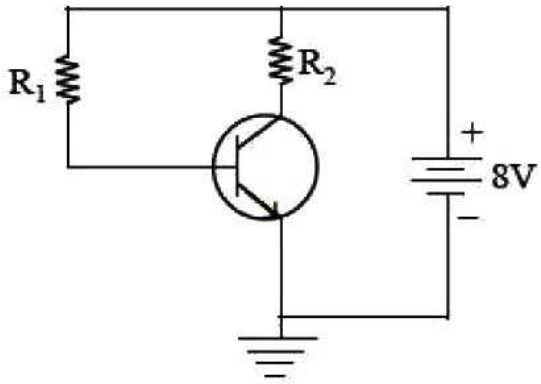
1)$\frac{Rh}{m}$ 2)$\frac{9m}{400Rh}$ 3)$\frac{9Rh}{400m}$ 4)$\frac{7Rh}{400}$

118)The half life of $^{238}_{92}U$ against α- decay is 13.86×10^{16}s. The activity of 1g sample of $^{238}_{92}U$ is _____

1)$1.26 \times 10^4\ s^{-1}$ 2)$1.26 \times 10^{-4}\ s^{-1}$

3)$12.6 \times 10^4\ s^{-1}$ 4) $12.6 \times 10^{-4}\ s^{-1}$

119)An npn transistor is connected in common emitter configuration as shown in the figure. If the collector current is 5 mA, V_{BE} = 0.6 V, V_{CE} = 3V and common emitter current amplification factor is 50, then the values of R_1 and R_2 are respectively



1)1 kΩ, 74 kΩ

2)74 kΩ, 1 kΩ

3)37 kΩ, 2 kΩ

4)2 kΩ, 37 kΩ

120)The maximum distance between the transmitting and receiving TV towers is 65km. If the ratio of the heights of the TV transmitting tower to receiving tower is 36 : 49, the heights of the transmitting and receiving towers respectively are (Radius of earth 6400 km)

1)51.2 m, 80 m

2)70.3 m, 95.7 m

3)30 m, 65m

4)25 m, 75 m

APEAMCET-2018 -- Engineering Stream Final Key Date: 22-04-18 AN (Shift 2)	
81	2
82	4
83	1
84	4
85	2
86	2
87	4
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89	1
90	3
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94	4
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100	2
101	4
102	3
103	3
104	1
105	3
106	1
107	4
108	2
109	2
110	3
111	1
112	4
113	1
114	4
115	4
116	1
117	3
118	1
119	2
120	2