AP EAMCET Physics Previous Questions with Key – Test 9

81)The current in a diode is given by the equation I=($e^{1000V/T}$ -1) where 'V' is applied voltage in volt and 'T' is absolute temperature in Kelvin. A student measures the current as 11mA at 300K. If the error in measuring voltage is ±0.01V, error in the value of current in mA is

1) ±0.4

2) ±3

3) ±2

4) ±1

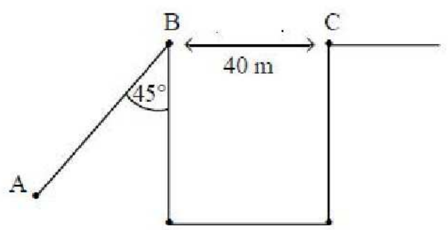
82)A stone is dropped from the top of a tower of height h= 60m. Simultaneously another stone is projected vertically upwards from the foot of the tower. They meet at a height $\frac{2h}{3}$ from the ground level. The initial velocity of the stone projected upwards is (g=10ms^{-2}).

1)20ms^{-1} 2)60ms^{-1} 3)10ms^{-1} 4)30ms^{-1}

83)A body is projected at an angle of 45° with the horizontal with a velocity of 60√2 ms^{-1}. Then the angle made by its velocity with the horizontal after 6 s is

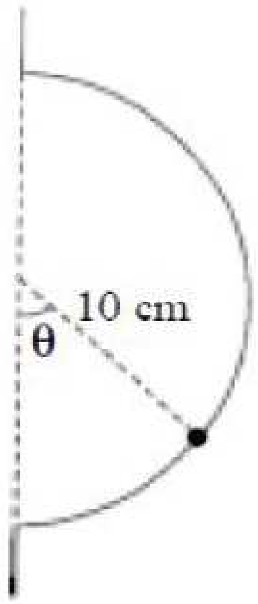
1)45° 2)0° 3)30° 4)60°

84)The top of a smooth inclined plane of length 20√2 m is connected to a the edge of a well of a diameter 40 m making an angle of 45° as shown in figure. A body is projected along the inclined plane with a velocity 'u'. If the body crosses the well without falling in it then the minimum value of 'u' is(g=10ms^{-2})



1)20 ms^{-1} 2)20√2 ms^{-1} 3)10√2 ms^{-1} 4)15√2 ms^{-1}

85)A small bead of mass 108 g slides without friction along a semicircular wire of radius 10 cm that rotates about a vertical axis at a rate of $10\sqrt{2}$ rad s^{-1} as shown in the figure. The value of θ for which the bead will remain stationary relative to the rotating wire is — ($g=10ms^{-2}$)



1)30°

2)45°

3)60°

4)75°

86)A body of mass 5 Kg is placed on a rough horizontal surface of coefficient of static friction $\frac{1}{3}$. The least pulling force to be applied on the body at an angle 45° with the horizontal to slide it, is ($g=10ms^{-2}$)

1) $25\sqrt{2}$ N

2) $\frac{25}{\sqrt{2}}$ N

3) $50\sqrt{2}$

4) $\frac{75}{\sqrt{2}}$ N

87)A simple pendulum of length $\frac{10}{3}$ meter with a bob of mass 3m is hanging freely from a right rigid support. A bullet of mass 'm' is fired with a velocity 50ms-1 from the ground at an angle θ with the horizontal. When the bullet is at its highest point of its trajectory, it collides head on with the bob of the pendulum and gets embedded in the bob. After collision, if the pendulum moves through a maximum angle of 120°, then the value of 'θ'is ($g=10ms^{-2}$)

1) $\cos^{-1}(0.8)$

2) $\cos^{-1}(0.6)$

3) $\cos^{-1}(0.4)$

4) $\cos^{-1}(0.3)$

88)The kinetic energy of a particle moving along a straight line is proportional to the time 't' of its travel. Then its acceleration is proportional to

1) $\frac{1}{\sqrt{t}}$

2) $\frac{1}{t}$

3) t

4) t^2

89)A ball of mass 2g moving with a velocity of 2ms-1 collides with another ball of mass 8g which is at rest and comes to rest after collision. Then the coefficient of restitution is

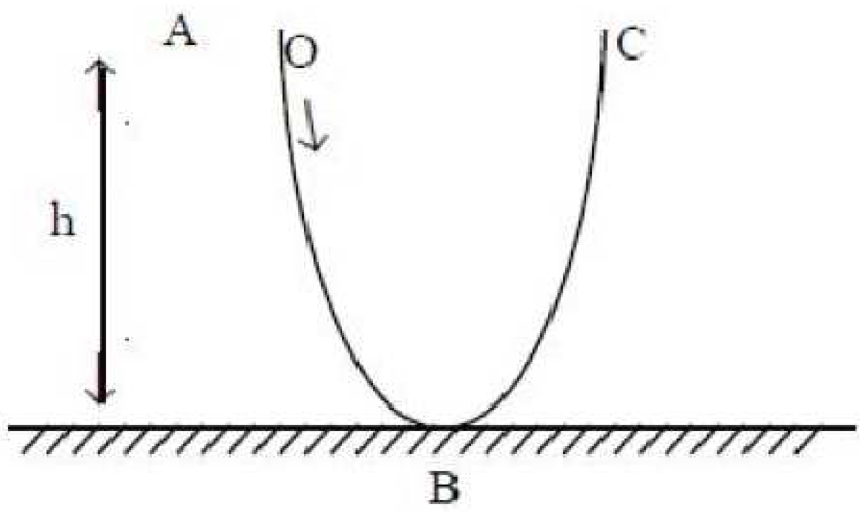
1)1

2)0.75

3)0.5

4)0.25

90)A hollow sphere rolls down a parabolic path ABC From a height 'h' as shown in the figure. Portion AB of the path is rough while BC is smooth. The height raised by the sphere in BC is



1) $\frac{3h}{5}$

2) $\frac{5h}{7}$

3) $\frac{5h}{3}$

4) $\frac{7h}{5}$

91)Two particles executing SHM along a straight a line have same amplitude 'A' and time period 'T'. At t=0, one particle is at a displacement +A and another is at a displacement $-\frac{A}{2}$ and they are approaching towards each other. They cross each other after a time

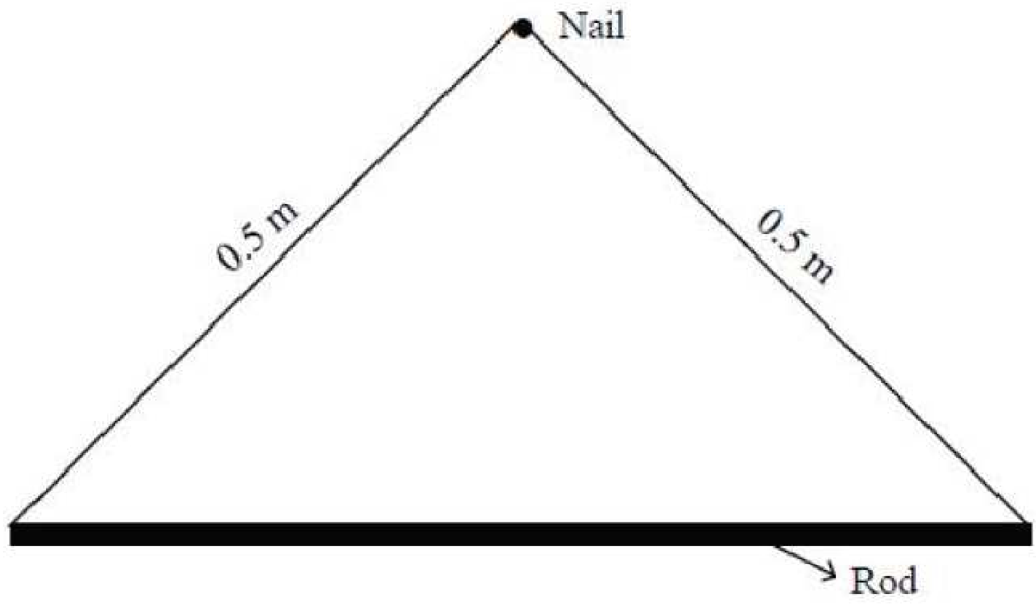
1) $\frac{T}{3}$ 2) $\frac{T}{4}$ 3) $\frac{5T}{6}$ 4) $\frac{T}{3}$

92) The required percentage increase in the energy of the earth's satellite to shift it from an orbit of radius r to $\frac{3r}{2}$

1)16.67% 2)20.33% 3)66.67% 4)33.33%

93)A uniform steel rod of mass 1.8kg and length 0.8m is hung from a nail with the help of a steel wire of area of cross section $0.01mm^2$ and unstretched length of 1m as shown in the figure. The centre of mass of the rod lies vertically below the nail. The increase in the distance between the centre of mass of the rod and nail due to stretching of the wire as the rod hungs is — mm.

(Young's modulus of steel $=2\times10^{11}NM^{-2}$ and acceleration due to gravity $=10ms^{-2}$)



1)50

2)25

3)12.5

4)6.25

94)A number of small water droplets of surface tension 'T', each of radius 'r' are combined to form a single drop of radius 'R'. If the released energy is converted in to kinetic energy, then the velocity acquired by the bigger drop is — (ρ - density of water)

1) $\sqrt{\dfrac{R-r}{\rho rR}}$ 2) $\dfrac{6TrR}{\rho(R-r)}$ 3) $\sqrt{\dfrac{6T}{\rho}\left(\dfrac{R-r}{rR}\right)}$ 4) $\dfrac{6T(R-r)}{\rho R}$

95) 2kg of rice at -20° is mixed with 5 kg of water at 20°C. Final mass of water formed is

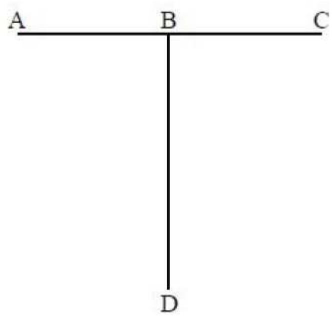
1)7kg

2)6kg

3)4kg

4)2kg

96)Three conducting rods AB, BC and BD made of same material and same across section are arranged as shown in the figure. The ratio of lengths of BD to BC when there is no heat flow in AB, is



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

97)A gas is governed by an equation $V = \frac{aT^3}{P}$ where P, V and T are pressure, volume and temperature of the gas respectively and 'a' is a constant. If the temperature of the gas is doubled at constant pressure then the workdone by the gas is

1)$6aT^3$ 2)$8aT^3$ 3)$9aT^3$ 4)$9aT^3$

98)For 1 mole of an ideal gas, during an adiabatic process, the square of the pressure of a gas is found to be proportional to the cube of its absolute temperature. The specific heat of the gas at a constant volume is (R is universal gas constant)

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

99)200cc of an ideal gas(γ=1.5) expands adiabatically. If the rms speed of the gas molecules becomes half of the initial value, the final volume of the gas is

1)900 cc 2)1600 cc 3)2700 cc 4)3200 cc

100)56 tuning forks are arranged such that each fork produces 4 beats per second with its previous one, If the frequency of the last fork is twice that of the first, the frequency of 19th fork is —

1)292 HZ

2)302 HZ

3)272 HZ

4)312 HZ

101)A closed pipe is in resonance with a tuning fork at 27°C when its length is 20 cm. If the pipe is to be in resonance with the same tuning fork at 7°C then the change in the length of the pipe required is nearly

1)1 mm

2)7 mm

3)5 mm

4)13 mm

102)The distance between an object and its real image formed by a lens is 'D'. If the magnification is 'm', the focal length of the lens is

1)$\left(\frac{m-1}{m}\right)D$

2)$\frac{mD}{m+1}$

3) $\frac{(m-1)D}{m^2}$

4) $\frac{mD}{(m+1)^2}$

103)In a diffraction pattern due to a single slit, the angular width of central maxima becomes half when the wavelength of the light used is changed from λ to 7000 Δ. Then the value of λ is

1) 3500 Δ 2) 4200 Δ 3)5000 Δ 4)5890 Δ

104)Three concentric spherical metallic shells A,B and C of radii a= 7 cm, b=17 cm and ‘c’ (a<b<c) have surface charge densities σ, -σ and σ respectively. If A and C are at the same potential, then the value of ‘c’ is

1)20 cm

2)10 cm

3)34 cm

4)24 cm

105)A charged bead is sliding freely through a string held vertically under tension. An electric field is applied parallel to the string so that the bead stays at rest at the middle of the string. If the electric field is switched off momentarily and switched on again, then

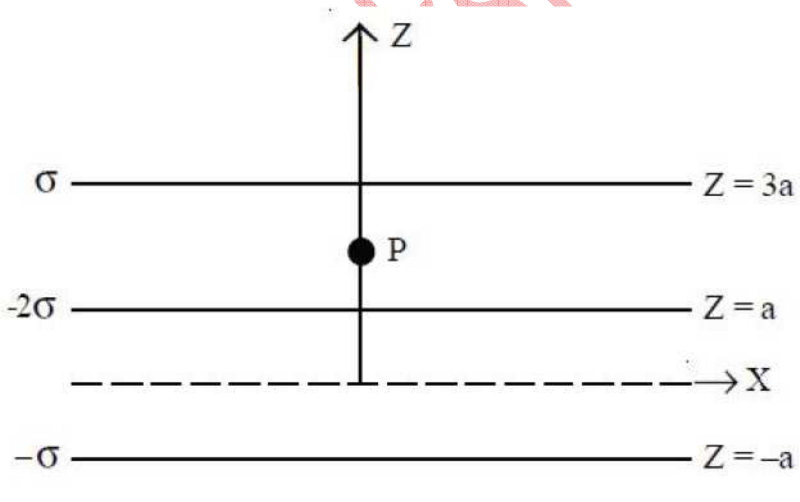
1)the bead falls off momentarily and then stopped

2)the bead moves downwards and then moves upwards

3)the bead moves downwards with constant acceleration

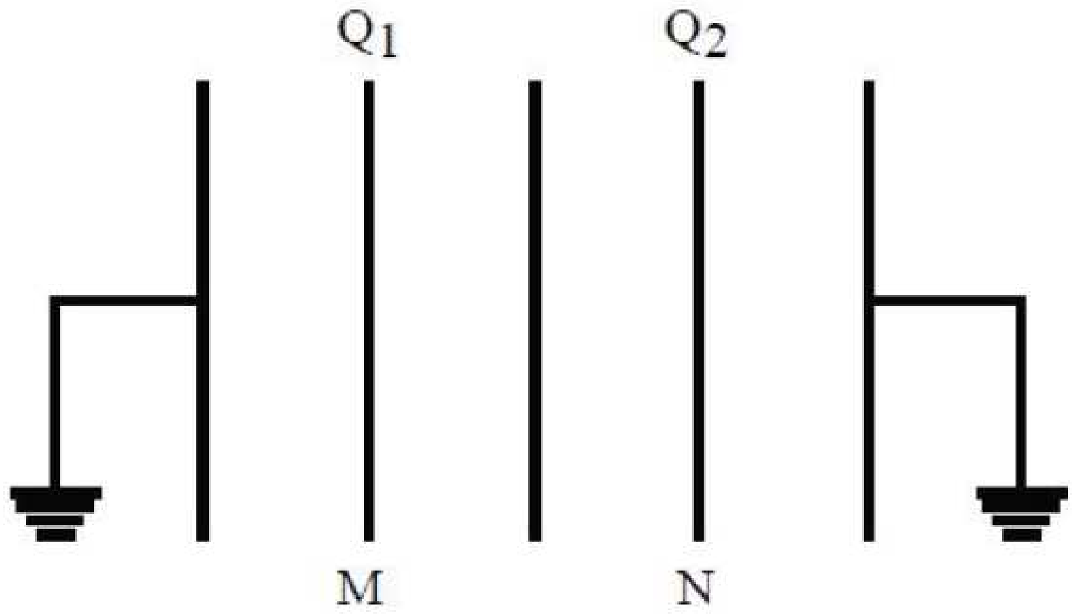
4)the bead moves downwards with constant velocity

106)The infinitely long charged non conducting sheets are placed as shown in the figure. The electric field at point ‘P’ is (σ - charge density, $\in_0$ – permittivity of free space)



1) $\frac{2\sigma}{\in_o}\hat{k}$ 2) $\frac{-3\sigma}{\in_o}\hat{k}$ 3) $\frac{4\sigma}{\in_o}\hat{k}$ 4) $\frac{-2\sigma}{\in_o}\hat{k}$

107)Five identical conducting plates, each of face area A are placed parallel to each other with a separation of 'd' between two adjacent plates as shown in figure. The plates M and N are given charges Q_1 and Q_2 respectively and the remaining plates are neutral. If the outermost plates are grounded, the potential difference between the plates M and N is —



1) $\frac{2d(Q_1 - Q_2)}{\in_0 A}$

2) $\frac{d(Q_1 - Q_2)}{\in_0 A}$

3) $\frac{4d(Q_1 - Q_2)}{\in_0 A}$

4) $\frac{d(Q_1 - Q_2)}{4\in_0 A}$

108)When two cells of emfs E_1 and E_2 and different internal resistances are connected in series with an external load resistor, the current through the load is 5 A. If the polarity of cell of emf E_2 is reversed then the current through the load is 2A. Then $\frac{E_1}{E_2} =$

1) $\frac{5}{2}$ 2) $\frac{2}{5}$ 3) $\frac{7}{3}$ 4) $\frac{3}{7}$

109)In a potentiometer, when a cell in the secondary circuit is shunted by a resistance 'R', balancing length is 'L_1'. on doubting the shunt resistance, balancing length increases to 'L_2'. Internal resistance of the cell is

1) $\frac{2R(L_2-L_1)}{L_1-2L_2}$

2) $\frac{2R(L_2-L_1)}{(2L_1-2L_2)}$

3) $\frac{R(L2-L1)}{L_1-2L_2}$

4) $\frac{R(L_2-L_1)}{(2L_1-L_2)}$

110)Match the following;

List - 1	List - 2
a)Flemings left hand rule	e) direction of induced current
b)Flemings right hand rule	f)south pole
c)Clockwise current	g)north pole
d)Anti Clockwise current	h)direction of force

The correct answer is

1)a-h ; b-e ; c-f ; d-g ;

2)a-e ; b-h ; c-f ; d-g ;

3) a-g ; b-e ; c-f ; d-h ;

4)a-h ; b-e ; c-g ; d-f ;

111)A magnetic field is applied on an electron moving with a velocity of 10^7 ms^{-1} at an angle of 30°. Then the time period of revolution of the electron in a circular path of radius 2m is —

1)5.5×10^{-6} s 2)7.0×10^{-7} s

3)2.5×10^{-6} s 4)3.5×10^{-7} s

112)Assertion (A) : Electromagnets are made of soft iron

Reason (R) : Coercivity is small for soft iron

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

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

3)(A) is true, but (R) is not true

4)(A) is not true, but (R) is true

113) A circular loop made of thin copper wire of mass ‘m’ is placed in a uniform magnetic field such that the plane of the loop is perpendicular to the magnetic field. If ‘d’ and ‘ρ’ are the density and resistivity of copper respectively and the magnetic field varies at a constant rate of $\frac{dB}{dt}$ then the induced current in the loop is

1) $\frac{4\pi m}{\rho d}\left(\frac{dB}{dt}\right)$

2) $\frac{4m}{\pi\rho d}\left(\frac{dB}{dt}\right)$

3) $\frac{\pi m}{4\rho d}\left(\frac{dB}{dt}\right)$

4) $\frac{m}{4\pi\rho d}\left(\frac{dB}{dt}\right)$

114)An emf E=6cos 6000t volt is applied to an L-R circuit of inductance 4mH and resistance 7Ω. The amplitude of the current in the circuit —

1)0.24 A

2)0.41 A

3)0.54 A

4)0.84 A

115)A plane electromagnetic wave of frequency 25 MHZ travels in free space along the X-direction. At a particular point in space and time the electric field is $\vec{E} = 6.3\hat{j}\,Vm^{-1}$. Then the magnetic field at that point is

1) $2.1\times10^{-8}\hat{k}T$

2) $2.1\times10^{8}\hat{k}T$

3) $2.1\times10^{-8}\hat{j}T$

4) $2.1\times10^{8}\hat{j}T$

116)de Broglie wavelengths associated with a proton and an electron are in the ratio 2:1. Their slopping potentials are approximately in the ratio of

1)$1:\sqrt{86}$

2)$\sqrt{86}:1$

3)$1:(86)^2$

4)1:86

117)The radius of the innermost electron 0rbit of hydrogen atom is 5.3×10^{-11}m. Then the ratio of radii of the orbits of n =2 and n= 3 is

1)9:4

2)2:3

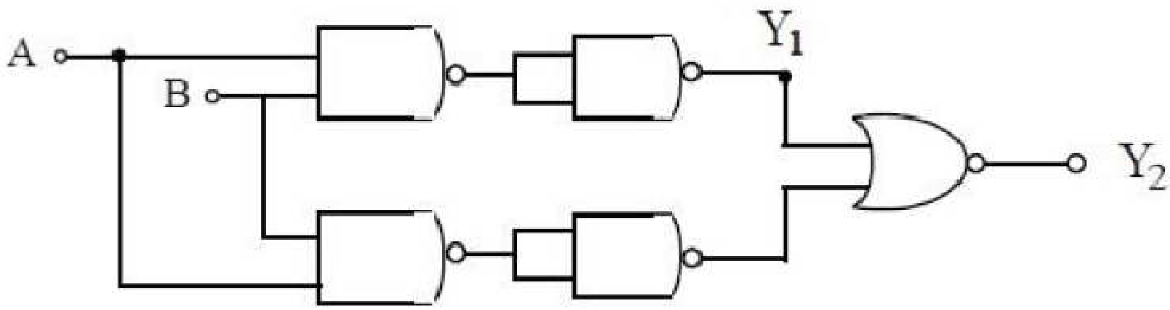
3)4:9

4)3:2

118) Two radioactive materials Y_1 and Y_2 initially contain same number of nuclei. Their decay constants are $9\lambda s^{-1}$ and $6\lambda s^{-1}$ respectively. The time after which the ratio of number of undecayed nuclei of Y_1 and Y_2 becomes 1/e is

1)$\frac{1}{3\lambda}s$ 2)$\frac{1}{15\lambda}s$ 3)$\frac{1}{10\lambda}s$ 4)$\frac{1}{8\lambda}s$

119)In the given logic circuit A=1 and B=0. The values of Y_1 and Y_2 are respectively



1)1,0

2)0,1

3)1,1

4)0,0

120)A TV tower has a height of 150m. If the population density around the TV tower is $10^3 km^{-2}$ then the population covered by the tower is (Radius of the earth, R is 6.4×10^6m)

1)60.288 lakh

2) 40.192 lakh

3)106.486 lakh

4)26.428 lakh

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APEAMCET-2018 -- Engineering Stream Final Key Date: 24-04-18 FN (Shift 1)	
81	3
82	3
83	1
84	3
85	3
86	3
87	3
88	3
89	2
90	2
91	4
92	1
93	4
94	3
95	2
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106	2
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113	2
114	2
115	3
116	4
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118	3
119	4
120	4