AP EAMCET Physics Previous Questions with Key – Test 6

81)Two resistances 60.36 Ω and 30.09 Ω are connected in paprallel. The equivalent resistance is

1)20 ± 0.08 Ω

2)20 ± 0.06 Ω

3)20 ± 0.03 Ω

4)20 ± 0.10 Ω

82)Assertion (A): The velocity of a projective at a point on its trajectory is equal to the slope at that point.

Reason (R): The velocity vector at a point is always along the tangent to the trajectory at that point.

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 body is projected from the ground at an angle of $\tan^{-1}\left(\dfrac{8}{7}\right)$ with the horizontal. The ratio of the maximum height attained by it to its range is

1)8:7   2)4:7   3)2:7   4)1:7

84) A body is projected with a speed 'u' at an angle 'θ' with the horizontal. The radius of curvature of the trajectory when it makes an angle $\left(\dfrac{\theta}{2}\right)$ with the horizontal is

(g – acceleration due to gravity)

1) $\dfrac{u^2 \cos^2 \theta \sec^3 \left(\theta/2\right)}{\sqrt{3}\,g}$

2) $\dfrac{u^2 \cos^2 \theta \sec^3 \left(\theta/2\right)}{2g}$

3) $\dfrac{2u^2 \cos^3 \theta \sec^2 \left(\theta/2\right)}{g}$

4) $\dfrac{u^2 \cos^2 \theta \sec^3 \left(\theta/2\right)}{g}$

85) Sand is to be piled up on a horizontal ground in the form of a regular cone of a fixed base of radius R. Coefficient of static friction between the sand layers is μ. Maximum volume of the sand that can be piled up in the form of cone without slipping on the ground is
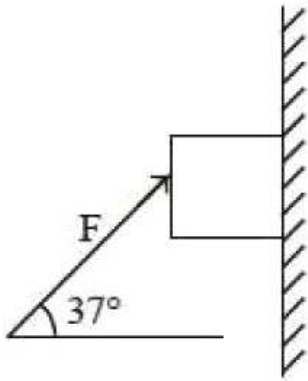
1) $\dfrac{\mu R^3}{3\pi}$

2) $\dfrac{\mu R^3}{3}$

3) $\dfrac{\pi R^3}{3\mu}$

4) $\dfrac{\mu \pi R^3}{3}$

86)A block of mass 2kg is being pushed against a wall by a force F = 90 N as shown in the figure. If the coefficient of friction is 0.25, then the magnitude of acceleration of the block is _____

$(g = 10 \text{ ms}^{-2}) \left(\sin 37° = \dfrac{3}{5} \right)$

1)16ms^{-2}

2)8ms^{-2}

3)38ms^{-2}

4)54ms^{-2}

87)A body of mass 2kg thrown vertically upward from the ground with a velocity of 8ms^{-1} reaches a maximum height of 3 m. The work done by the air resistance is _____

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

1)4J   2)60J   3)64J   4)8J

88)The system of two masses 2 kg and 3kg shown in the figure is released from rest. The work done on 3kg block by the force of gravity during first 2 seconds of its motion is (g = 10 ms^{-2})
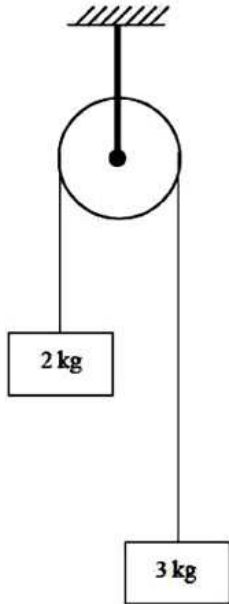

    1)120 J

    2)80J

    3)40J

    4)30J

89)A rigid metallic sphere is spinning around its own axis in the absence of external torque. If the temperature is raised, its volume increases by 9%. The change in its angular speed is

    1)increases by 9%

    2)decreases by 9%

    3)increases by 6%

    4)decreases by 6%

90)Two spheres P and Q, each of mass 200 g are attached to a string of length one metre as shown in the figure. The string and the spheres are then whirled in a horizontal circle a bout 'O' at a constant angular speed. The ratio of the tension in the string between P and Q to that of between P and O

(P is at the mid point of line joining O and Q)
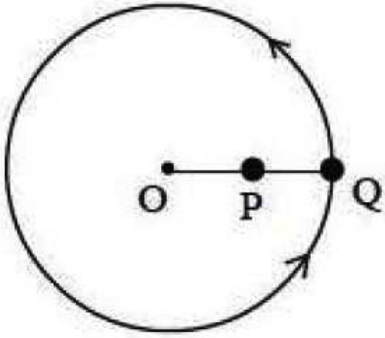
1) $\dfrac{1}{2}$

2) $\dfrac{2}{3}$

3) $\dfrac{3}{2}$

4) $\dfrac{2}{1}$

91)The potential energy of a simple harmonic oscillator of mass 2 kg at its mean position is 5J. If its total energy is 9 J and amplitude is 1 cm, then its time period is

1) $\dfrac{\pi}{100} s$ 2) $\dfrac{\pi}{50} s$ 3) $\dfrac{\pi}{20} s$ 4) $\dfrac{\pi}{10} s$

92) Three masses m, 2m and 3m are arranged in two triangular configurations as shown in figure 1 and figure 2. Work done by an external agent in changing the configuration from figure 1 to figure 2 is
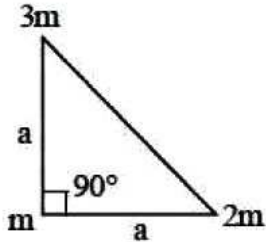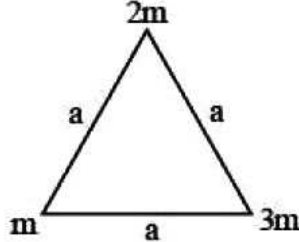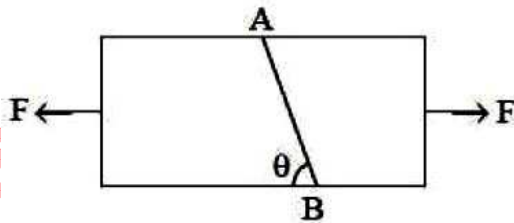

figure 1   figure 2

1) $\dfrac{6Gm^2}{a}\left[2-\dfrac{6}{\sqrt{2}}\right]$

2) 0

3) $-\dfrac{Gm^2}{a}\left[6+\dfrac{6}{\sqrt{2}}\right]$

4) $-\dfrac{Gm^2}{a}\left[6-\dfrac{6}{\sqrt{2}}\right]$

93) Two equal and opposite forces each F act on a rod of uniform cross-sectional area 'a' as shown in the figure. Shearing stress on the section AB will be

1) $\dfrac{F\sin\theta\cos\theta}{a}$ 2) $\dfrac{F\sin\theta}{a}$ 3) $\dfrac{F\cos\theta}{a}$ 4) $\dfrac{F\sin^2\theta}{a}$

94)A body is suspended by a light string. The tensions in the string when the body is in air, when the body is totally immersed in water and when the body is totally immersed in a liquid are respectively 40.2 N, 28.4 N and 16.6 N. The density of the liquid is _____

    1)1200 kgm^{-3}

    2)1600 kgm^{-3}

    3)2000 kgm^{-3}

    4)2400 kgm^{-3}

95)Steam at 100°C is passed into 1 kg of water contained in a calorimeter at 9°C till the temperature of water and calorimeter is increased to 90°C. The mass of the steam condensed in nearly

(Water equivalent of calorimeter = 0.1 kg

Specific heat of water = 1 calg^{-1}°C^{-1}

Latent heat of vapourisation = 540 calg^{-1})

    1)81 g   2)162 g   3)243 g   4)486 g

96)Three very large plates of same area are kept parallel and close to each other. They are considered as ideal black surfaces and have very high thermal conductivity. First and third plates are maintained at absolute temperatures 2T and 3T respectively. Temperature of the middle plate in steady state is

    1)$\left(\dfrac{65}{2}\right)^{\frac{1}{4}} T$ 2)$\left(\dfrac{97}{4}\right)^{\frac{1}{4}} T$ 3)$\left(\dfrac{97}{2}\right)^{\frac{1}{4}} T$ 4)$(97)^{\frac{1}{4}} T$

97)A thermally insulated vessel with nitrogen gas at 27°C is moving with a velocity of 100 ms^{-1}. If the vessel is stopped suddenly, the percentage change in the pressure of the gas is nearly

(Assume entire loss in KE of the gas is given as heat to gas and R = 8.3 Jmol^{-1}K^{-1})

1)1.1

2)0.93

3)0.5

4)2.25

98)Match the following:

List – I   **List – II**

A) Zeroth law of Thermodynamics   I) Direction of flow of heat

B) First law of thermodynamics   II) Work done is zero

C) Free expansion of a gas   III) Thermal equilibrium

D) Second law of thermodynamics   IV) Law of conservation of energy

The correct answer is

1)A-II, B-IV, C-III, D-I

2)A-III, B-IV, C-II, D-I

3)A-III, B-I, C-II, D-IV

4)A-I, B-III, C-IV, D-II

99)For a molecule of an ideal gas, the number density is $2\sqrt{2}\times10^8\,cm^{-3}$ and the mean free path is $\dfrac{10^{-2}}{\pi}$ cm. The diameter of the gas molecule is

    1)5×10^{-4} cm

    2)0.5×10^{-4} cm

    3)2.5×10^{-4} cm

    4)4×10^{-4} cm

100)A solid ball is suspended from the ceiling of motor car through a light string. A transverse pulse travels at the speed 60 cms^{-1} on the string when the car is at rest. When the car accelerates on a horizontal road, speed of the pulse is 66 cms^{-1}. The acceleration of the car is nearly (g = 10 ms^{-2})

    1)4.3 ms^{-2}

    2)2.9 ms^{-2}

    3)6.8 ms^{-2}

    4)5.5 ms^{-2}

101)A reflector is moving with 20 ms^{-1} towards a stationary source of sound. If the source is producing sound waves of 160 Hz then the wavelength of the reflected wave is (speed of sound in air is 340 ms^{-1})

    1)$\dfrac{17}{8}\,m$ 2)$\dfrac{17}{11}\,m$ 3)$\dfrac{17}{9}\,m$ 4)$\dfrac{17}{16}\,m$

102)A light ray incidents normally on one surface of an equilateral prism. The angle of deviation of the light ray is

(Refractive index of the material of the prism = √2)

    1)60°

    2)30°

    3)0°

    4)120°

103)Two polaroids are placed in the path of unpolarised light beam of intensity I_0 such that no light is emitted from the second Polaroid. If a third Polaroid whose polarization axis makes an angle θ with that of the first Polaroid is placed between the polaroids, then intensity of light emerging from the last Polaroid is

1) $\left(\dfrac{I_0}{8}\right)\sin^2 2\theta$

2) $\left(\dfrac{I_0}{4}\right)\sin^2 2\theta$

3) $\left(\dfrac{I_0}{2}\right)\cos^2 \theta$

4) $I_0 \cos^2 \theta$

104)Two point charges are kept in air with a separation between them. The force between them is F_1, if half of the space between the charges is filled with a dielectric of dielectric constant 4 and the force between them is F_2, if $\frac{1}{3}$rd of the space between the charges is filled with dielectric of dielectric constant 9. Then $\frac{F_1}{F_2}$ is

   1)$\frac{27}{64}$

   2)$\frac{16}{81}$

   3)$\frac{81}{64}$

   4)$\frac{100}{81}$

105)A simple pendulum with a bob of mass 40 g and charge +2 μC makes 20 oscillations in 44 seconds. A vertical electric field of magnitude 4.2×10^4 NC^{-1} pointing downward is applied. The time taken by the pendulum to make 15 oscillations in the electric field is (Acceleration due to gravity = 10 ms^{-2})

   1)30 S

   2)60 S

   3)90 S

   4)15 S

106)A parallel plate capacitor has a capacity 80×10^{-6} F when air is present between its plates. The space between the plates is filled with a dielectric slab of dielectric constant 20. The capacitor is now connected to a battery of 30 V by wires. The dielectric slab is then removed. Then the charge passing through the wire is
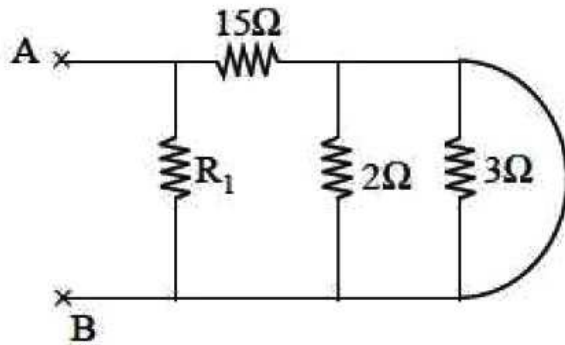
1)12×10^{-3} C

2)25.3×10^{-3} C

3)120×10^{-3} C

4)45.6×10^{-3} C

107)Three uncharged capacitors of capacities C_1, C_2 and C_3 are Connected as shown in the figure. A, B and C are at potentials V_1, V_2 and V_3 respectively. The potential at 'O' is
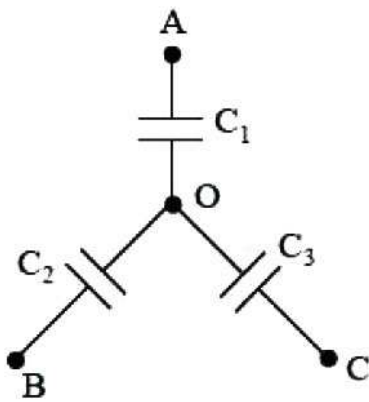

1)$\dfrac{V_1C_1 + V_2C_2 + V_3C_3}{C_1 + C_2 + C_3}$

2)$\dfrac{V_1C_1 + V_2C_2 - V_3C_3}{C_1 + C_2 + C_3}$

3)$\dfrac{V_1C_1 - V_2C_2 - V_3C_3}{C_1 + C_2 + C_3}$

4)Zero

108)The equivalent between A and B is 6Ω. The value of R_1 is

1)20Ω

2)10Ω

3)5Ω

4)25Ω

109)A battery of emf 10V is connected to a uniform wire AB of 1 m length and having a resistance of 10Ω in series with a 10Ω resistor as shown in the figure. Two cells of emf 2 V and 3 V having internal resistances 2Ω and 3Ω respectively are connected as shown in the figure. If the galvanometer shown null deflection at point J on the wire, the distance of point J from the point B is _____
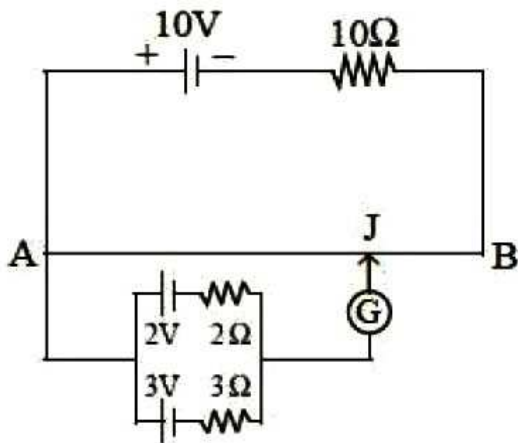
1)48 cm

2)50 cm

3)52 cm

4)54 cm

110)Two infinitely long wires carry currents 4 A and 3 A Placed along X-axis and Y-axis respectively. Magnetic field at a point P(0, 0, d) m will be _____ T.

1)$\frac{4\mu_0}{2\pi d}$

2)$\frac{3\mu_0}{2\pi d}$

3)$\frac{7\mu_0}{2\pi d}$

4)$\frac{5\mu_0}{2\pi d}$

111)Two moving coil galvanometers, X and Y have coils with resistances 10Ω and 14Ω, cross-sectional areas 4.8×10^{-3} m² and 2.4×10^{-3}m², number of turns 30 and 45 respectively. They are placed in magnetic fields of 0.25 T and 0.50 T respectively. Then the ratio of their current sensitivities and the ratio of their voltage sensitivities are respectively.

1)2 : 3; 14 : 15

2)5 : 7; 2 : 1

3)2 : 13; 1 : 2

4)14 : 15; 2 : 9

112)Two short bar magnets each of magnetic moment 9 Am^2 are placed such that one is at x = -3 cm and the other at y = -3 cm. If their magnetic moments are directed along positive and negative X-directions respectively then the resultant magnetic field at the origin is

1)100 T

2)10 T

3)0.1 T

4)0.001 T

113)A conducing rod PQ of length 1m is moving with a uniform speed 2 ms^{-1} in a uniform magnetic field of 4 T which is directed into the paper. A capacitor of capacity 10μF is connected as shown in the figure. Then the charges on the plates of the capacitor are

1)q_A = +80 μC ; q_B = -80μC

2)q_A = -80 μC ; q_B = +80μC

3)q_A = +1.25 μC ; q_B = -1.25μC
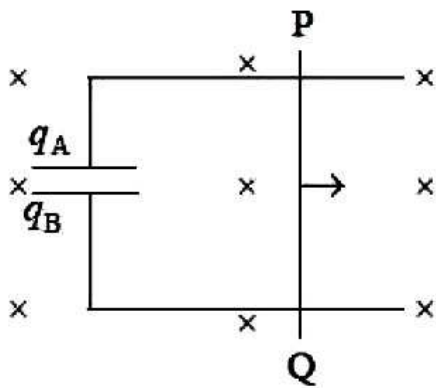
4)q_A = -1.25 μC ; q_B = +1.25μC

114)For the circuit shown below, phase difference between emf and current is $\frac{\pi}{4}$ radian as shown in the graph. If the impedance of the circuit is 1414Ω then the values of P and Q are

$E = E_0 \sin (100t)$

1)1kΩ, 10μF

2)1kΩ, 1μF

3)1kΩ, 10mH
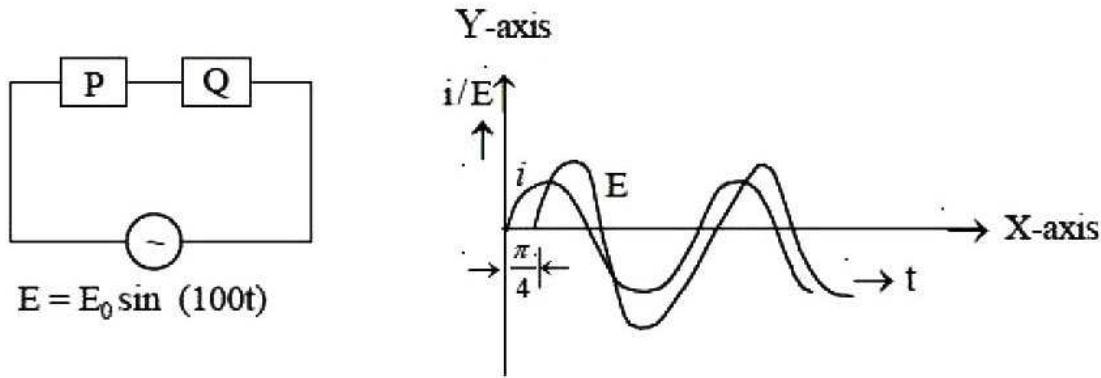
4)1kΩ, 1mH

115)In a plane electromagnetic wave, the electric field oscillates with a frequency 2×10^{10} s^{-1} and amplitude 40 Vm^{-1}, then the energy density due to electric field is _____

($\varepsilon_0 = 8.85 \times 10^{-12}$ Fm^{-1})

1)1.52×10^{-9} Jm^{-3}

2)2.54×10^{-9} Jm^{-3}

3)3.54×10^{-9} Jm^{-3}

4)4.56×10^{-9} Jm^{-3}

116) Photons of frequencies equal to the frequencies of H_β and H_∞ lines of hydrogen incident on a photosensitive plate whose threshold frequency is equal to the frequency of H_α line of hydrogen. The ratio of the maximum kinetic energies of the emitted electrons is

1) 7 : 16

2) 3 : 4

3) 8 : 27

4) 5 : 36

117) Hydrogen atom is in its nth energy state. If de-Broglie wavelength of the electron is λ, then

1) $\lambda \alpha \dfrac{1}{n^2}$

2) $\lambda \alpha \dfrac{1}{n}$

3) $\lambda \alpha n^2$

4) $\lambda \alpha n$

118) If 200 MeV of energy is released in the fission of one nucleus of $^{235}_{92}U$, the number of nuclei that must undergo fission to release an energy of 1000 J is

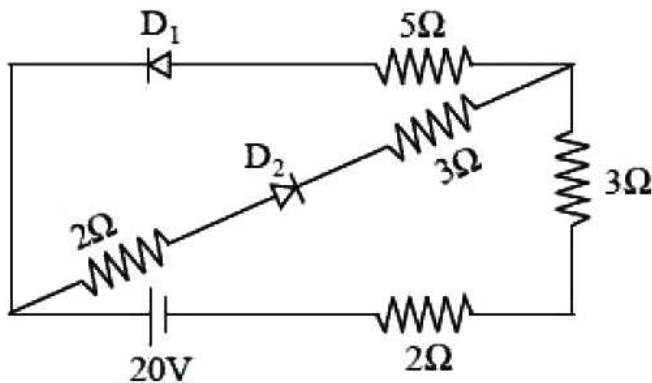1) 3.125×10^{13}

2) 6.25×10^{13}

3) 12.5×10^{13}

4) 3.125×10^{14}

119)If the diodes are ideal in the circuit given below, then the current through the cell is

1)4A

2)1.5A

3)2A

4)3A

120)If a message signal of frequency 10kHz and peak voltage 12 V is used to modulate a carrier wave of frequency 1 MHz, the modulation index is 0.6. To make the modulation index 0.75, the carrier peak voltage should be

1)decreased by 25%

2)increased by 25%

3)decreased by 20%

4)increased by 20%

APEAMCET-2018 --- Engineering Stream Final Key Date: 22-04-18 FN (Shift 1)	
81	1
82	4
83	3
84	4
85	4
86	2
87	1
88	1
89	4
90	2
91	1
92	4
93	1
94	3
95	2
96	3
97	4
98	2
99	1
100	3
101	3
102	1
103	1
104	4
105	1
106	4
107	1
108	2
109	3
110	4
111	1
112	3
113	1
114	1
115	3
116	1
117	4
118	1
119	3
120	3