JEE MAIN 2019 Question Paper and Answer Key – Paper 1 (Jan 12, Shift 1)

Section : Physics

Q.1 An ideal gas occupies a volume of $2\ m^3$ at a pressure of 3×10^6 Pa. The energy of the gas is :

Options

1. 9×10^6 J
2. 6×10^4 J
3. 10^8 J
4. 3×10^2 J

Question ID : **4165299696**
Option 1 ID : **41652938244**
Option 2 ID : **41652938245**
Option 3 ID : **41652938242**
Option 4 ID : **41652938243**
Status : **Not Answered**
Chosen Option : **--**

Q.2 A travelling harmonic wave is represented by the equation $y(x, t) = 10^{-3}\sin(50t + 2x)$, where x and y are in meter and t is in seconds. Which of the following is a correct statement about the wave ?

Options

1. The wave is propagating along the negative x-axis with speed $25\ ms^{-1}$.
2. The wave is propagating along the positive x-axis with speed $100\ ms^{-1}$.
3. The wave is propagating along the positive x-axis with speed $25\ ms^{-1}$.
4. The wave is propagating along the negative x-axis with speed $100\ ms^{-1}$.

Question ID : **4165299698**
Option 1 ID : **41652938251**
Option 2 ID : **41652938252**
Option 3 ID : **41652938250**
Option 4 ID : **41652938253**
Status : **Answered**
Chosen Option : **3**

Q.3

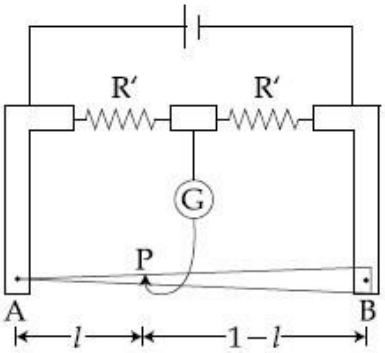
An ideal battery of 4 V and resistance R are connected in series in the primary circuit of a potentiometer of length 1 m and r 490 Ω ice 5 Ω. The value of R, to give a F 480 Ω al difference of 5 mV across 10 cm of potentiometer wire, is :

Options
1. 490 Ω
2. 480 Ω
3. 395 Ω
4. 495 Ω

Question ID : **4165299702**
Option 1 ID : **41652938267**
Option 2 ID : **41652938266**
Option 3 ID : **41652938269**
Option 4 ID : **41652938268**
Status : **Answered**
Chosen Option : **3**

Q.4

In a meter bridge, the wire of length 1 m has a non-uniform cross-section such that, the variation $\frac{dR}{dl}$ of its resistance R with length l is $\frac{dR}{dl} \propto \frac{1}{\sqrt{l}}$. Two equal resistances are connected as shown in the figure. The galvanometer has zero deflection when the jockey is at point P. What is the length AP ?



Options
1. 0.2 m
2. 0.3 m
3. 0.25 m
4. 0.35 m

Question ID : **4165299715**
Option 1 ID : **41652938318**
Option 2 ID : **41652938320**
Option 3 ID : **41652938319**
Option 4 ID : **41652938321**
Status : **Marked For Review**
Chosen Option : **2**

Q.5

A passenger train of length 60 m travels at a speed of 80 km/hr. Another freight train of length 120 m travels at a speed of 30 m/hr. The ratio of times taken by the passenger train to completely cross the freight train when : (i) they are moving in the same direction, and (ii) in the oppposite directions is :

Options

1. $\frac{11}{5}$
2. $\frac{5}{2}$
3. $\frac{3}{2}$
4. $\frac{25}{11}$

Question ID : **4165299688**
Option 1 ID : **41652938211**
Option 2 ID : **41652938212**
Option 3 ID : **41652938213**
Option 4 ID : **41652938210**
Status : **Not Answered**
Chosen Option : **--**

Q.6 Two electric bulbs, rated at (25 W, 220 V) and (100 W, 220 V), are connected in series across a 220 V voltage source. If the 25 W and 100 W bulbs draw powers P_1 and P_2 respectively, then :

Options

1. $P_1 = 16$ W, $P_2 = 4$ W
2. $P_1 = 16$ W, $P_2 = 9$ W
3. $P_1 = 9$ W, $P_2 = 16$ W
4. $P_1 = 4$ W, $P_2 = 16$ W

Question ID : **4165299703**
Option 1 ID : **41652938272**
Option 2 ID : **41652938271**
Option 3 ID : **41652938270**
Option 4 ID : **41652938273**
Status : **Answered**
Chosen Option : **3**

Q.7 A straight rod of length L extends from $x = a$ to $x = L + a$. The gravitational force it exerts on a point mass 'm' at $x = 0$, if the mass per unit length of the rod is $A + Bx^2$, is given by :

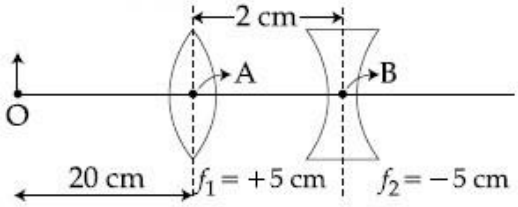
Options

1. $Gm\left[A\left(\frac{1}{a+L} - \frac{1}{a}\right) - BL\right]$
2. $Gm\left[A\left(\frac{1}{a} - \frac{1}{a+L}\right) - BL\right]$
3. $Gm\left[A\left(\frac{1}{a+L} - \frac{1}{a}\right) + BL\right]$

4. $Gm\left[A\left(\frac{1}{a}-\frac{1}{a+L}\right)+BL\right]$

Question ID : **4165299693**
Option 1 ID : **41652938232**
Option 2 ID : **41652938233**
Option 3 ID : **41652938230**
Option 4 ID : **41652938231**
Status : **Not Answered**
Chosen Option : **--**

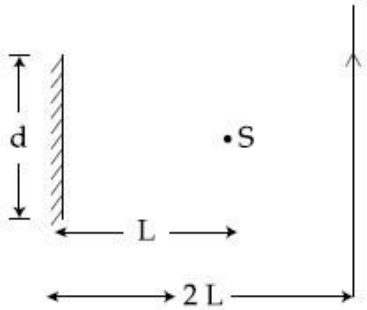
Q.8 What is the position and nature of image formed by lens combination shown in figure ? (f_1, f_2 are focal lengths)



Options
1. 70 cm from point B at left; virtual
2. 40 cm from point B at right; real
3. $\frac{20}{3}$ cm from point B at right, real
4. 70 cm from point B at right; real

Question ID : **4165299708**
Option 1 ID : **41652938291**
Option 2 ID : **41652938290**
Option 3 ID : **41652938293**
Option 4 ID : **41652938292**
Status : **Not Answered**
Chosen Option : **--**

Q.9 A point source of light, S is placed at a distance L in front of the centre of plane mirror of width d which is hanging vertically on a wall. A man walks in front of the mirror along a line parallel to the mirror, at a distance 2L as shown below. The distance over which the man can see the image of the light source in the mirror is :



Options
1. d
2. 2d

3. 3d

4. $\frac{d}{2}$

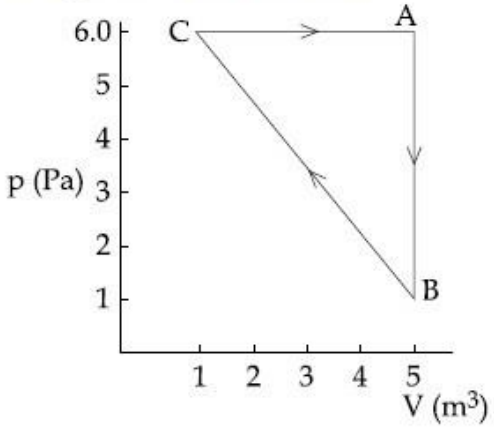
Question ID : **4165299709**
Option 1 ID : **41652938297**
Option 2 ID : **41652938296**
Option 3 ID : **41652938295**
Option 4 ID : **41652938294**
Status : **Not Answered**
Chosen Option : **--**

Q.10 A light wave is incident normally on a glass slab of refractive index 1.5. If 4% of light gets reflected and the amplitude of the electric field of the incident light is 30 V/m, then the amplitude of the electric field for the wave propogating in the glass medium will be :

Options
1. 30 V/m
2. 10 V/m
3. 24 V/m
4. 6 V/m

Question ID : **4165299707**
Option 1 ID : **41652938289**
Option 2 ID : **41652938286**
Option 3 ID : **41652938287**
Option 4 ID : **41652938288**
Status : **Not Answered**
Chosen Option : **--**

Q.11 For the given cyclic process CAB as shown for a gas, the work done is :

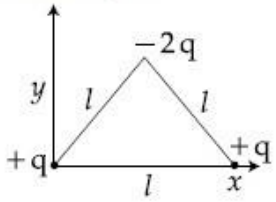


Options
1. 30 J
2. 10 J
3. 1 J
4. 5 J

Question ID : **4165299695**
Option 1 ID : **41652938238**
Option 2 ID : **41652938239**
Option 3 ID : **41652938241**

Option 4 ID : **41652938240**
Status : **Answered**
Chosen Option : **1**

Q.12 Determine the electric dipole moment of the system of three charges, placed on the vertices of an equilateral triangle, as shown in the figure :

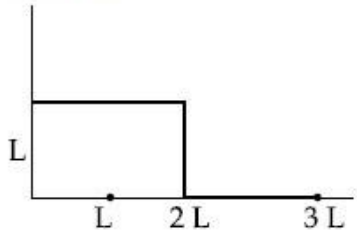


Options

1. $\sqrt{3}\, ql\, \dfrac{\hat{j} - \hat{i}}{\sqrt{2}}$
2. $(ql)\, \dfrac{\hat{i} + \hat{j}}{\sqrt{2}}$
3. $2ql\, \hat{j}$
4. $-\sqrt{3}\, ql\, \hat{j}$

Question ID : **4165299700**
Option 1 ID : **41652938261**
Option 2 ID : **41652938258**
Option 3 ID : **41652938260**
Option 4 ID : **41652938259**
Status : **Not Answered**
Chosen Option : **--**

Q.13 The position vector of the centre of mass $\vec{r}_{cm}$ of an asymmetric uniform bar of negligible area of cross-section as shown in figure is :



Options

1. $\vec{r}_{cm} = \dfrac{13}{8} L\, \hat{x} + \dfrac{5}{8} L\, \hat{y}$
2. $\vec{r}_{cm} = \dfrac{5}{8} L\, \hat{x} + \dfrac{13}{8} L\, \hat{y}$
3. $\vec{r}_{cm} = \dfrac{3}{8} L\, \hat{x} + \dfrac{11}{8} L\, \hat{y}$
4. $\vec{r}_{cm} = \dfrac{11}{8} L\, \hat{x} + \dfrac{3}{8} L\, \hat{y}$

Question ID : **4165299691**
Option 1 ID : **41652938222**
Option 2 ID : **41652938223**
Option 3 ID : **41652938225**
Option 4 ID : **41652938224**
Status : **Not Answered**
Chosen Option : **--**

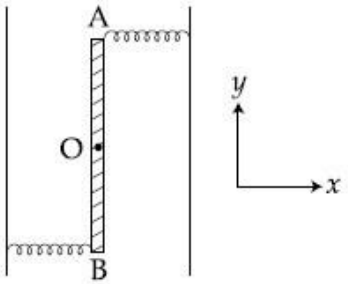
Q.14 A person standing on an open ground hears the sound of a jet aeroplane, coming from north at an angle 60° with ground level. But he finds the aeroplane right vertically above his position. If v is the speed of sound, speed of the plane is :

Options

1. $\frac{\sqrt{3}}{2}v$
2. $\frac{2v}{\sqrt{3}}$
3. v
4. $\frac{v}{2}$

Question ID : **4165299687**
Option 1 ID : **41652938208**
Option 2 ID : **41652938209**
Option 3 ID : **41652938206**
Option 4 ID : **41652938207**
Status : **Answered**
Chosen Option : **2**

Q.15 Two light identical springs of spring constant k are attached horizontally at the two ends of a uniform horizontal rod AB of length l and mass m. The rod is pivoted at its centre 'O' and can rotate freely in horizontal plane. The other ends of the two springs are fixed to rigid supports as shown in figure. The rod is gently pushed through a small angle and released. The frequency of resulting oscillation is :



Options

1. $\frac{1}{2\pi}\sqrt{\frac{3k}{m}}$
2. $\frac{1}{2\pi}\sqrt{\frac{2k}{m}}$

3. $\frac{1}{2\pi}\sqrt{\frac{6k}{m}}$

4. $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$

Question ID : **4165299697**
Option 1 ID : **41652938248**
Option 2 ID : **41652938246**
Option 3 ID : **41652938249**
Option 4 ID : **41652938247**
Status : **Answered**
Chosen Option : **2**

Q.16 A simple pendulum, made of a string of length l and a bob of mass m, is released from a small angle θ_0. It strikes a block of mass M, kept on a horizontal surface at its lowest point of oscillations, elastically. It bounces back and goes up to an angle θ_1. Then M is given by :

Options

1. $\frac{m}{2}\left(\frac{\theta_0+\theta_1}{\theta_0-\theta_1}\right)$

2. $m\left(\frac{\theta_0-\theta_1}{\theta_0+\theta_1}\right)$

3. $m\left(\frac{\theta_0+\theta_1}{\theta_0-\theta_1}\right)$

4. $\frac{m}{2}\left(\frac{\theta_0-\theta_1}{\theta_0+\theta_1}\right)$

Question ID : **4165299689**
Option 1 ID : **41652938215**
Option 2 ID : **41652938217**
Option 3 ID : **41652938216**
Option 4 ID : **41652938214**
Status : **Not Answered**
Chosen Option : **--**

Q.17 A 100 V carrier wave is made to vary between 160 V and 40 V by a modulating signal. What is the modulation index ?

Options

1. 0.3

2. 0.5

3. 0.6

4. 0.4

Question ID : **4165299713**
Option 1 ID : **41652938310**
Option 2 ID : **41652938312**
Option 3 ID : **41652938311**
Option 4 ID : **41652938313**
Status : **Not Answered**

Chosen Option : --

Q.18 A cylinder of radius R is surrounded by a cylindrical shell of inner radius R and outer radius 2R. The thermal conductivity of the material of the inner cylinder is K_1 and that of the outer cylinder is K_2. Assuming no loss of heat, the effective thermal conductivity of the system for heat flowing along the length of the cylinder is :

Options

1. $\frac{K_1 + K_2}{2}$
2. $K_1 + K_2$
3. $\frac{2K_1 + 3K_2}{5}$
4. $\frac{K_1 + 3K_2}{4}$

Question ID : **4165299694**
Option 1 ID : **41652938235**
Option 2 ID : **41652938234**
Option 3 ID : **41652938237**
Option 4 ID : **41652938236**
Status : **Not Answered**
Chosen Option : **--**

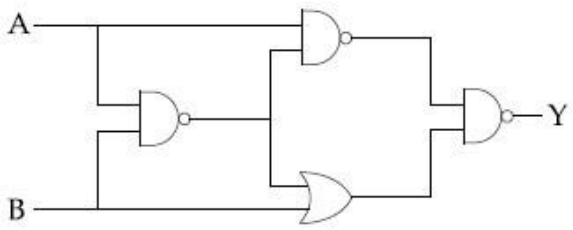
Q.19 The least count of the main scale of a screw gauge is 1 mm. The minimum number of divisions on its circular scale required to measure 5 μm diameter of a wire is :

Options

1. 50
2. 200
3. 100
4. 500

Question ID : **4165299686**
Option 1 ID : **41652938202**
Option 2 ID : **41652938204**
Option 3 ID : **41652938203**
Option 4 ID : **41652938205**
Status : **Answered**
Chosen Option : **3**

Q.20 The output of the given logic circuit is :



Options

1. $A\overline{B} + \overline{A}B$

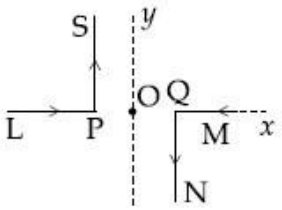
2. $AB + \overline{AB}$

3. $A\overline{B}$

4. $\overline{AB}$

Question ID : **4165299712**
Option 1 ID : **41652938306**
Option 2 ID : **41652938309**
Option 3 ID : **41652938307**
Option 4 ID : **41652938308**
Status : **Not Answered**
Chosen Option : **--**

Q.21 As shown in the figure, two infinitely long, identical wires are bent by 90° and placed in such a way that the segments LP and QM are along the x-axis, while segments PS and QN are parallel to the y-axis. If OP = OQ = 4 cm, and the magnitude of the magnetic field at O is 10^{-4} T, and the two wires carry equal currents (see figure), the magnitude of the current in each wire and the direction of the magnetic field at O will be ($\mu_0 = 4\pi \times 10^{-7}\ NA^{-2}$) :



Options
1. 20 A, perpendicular out of the page
2. 40 A, perpendicular out of the page
3. 20 A, perpendicular into the page
4. 40 A, perpendicular into the page

Question ID : **4165299704**
Option 1 ID : **41652938275**
Option 2 ID : **41652938277**
Option 3 ID : **41652938274**
Option 4 ID : **41652938276**
Status : **Not Answered**
Chosen Option : **--**

Q.22 A particle of mass m moves in a circular orbit in a central potential field $U(r) = \frac{1}{2}kr^2$. If Bohr's quantization conditions are applied, radii of possible orbitls and energy levels vary with quantum number n as :

Options
1. $r_n \propto \sqrt{n}, \quad E_n \propto n$
2. $r_n \propto \sqrt{n}, \quad E_n \propto \frac{1}{n}$
3. $r_n \propto n, \quad E_n \propto n$

4. $r_n \propto n^2, \quad E_n \propto \frac{1}{n^2}$

Question ID : **4165299711**
Option 1 ID : **41652938305**
Option 2 ID : **41652938304**
Option 3 ID : **41652938303**
Option 4 ID : **41652938302**
Status : **Answered**
Chosen Option : **2**

Q.23 A proton and an α-particle (with their masses in the ratio of 1 : 4 and charges in the ratio of 1 : 2) are accelerated from rest through a potential difference V. If a uniform magnetic field (B) is set up perpendicular to their velocities, the ratio of the radii $r_p : r_\alpha$ of the circular paths described by them will be :

Options
1. $1 : \sqrt{2}$
2. $1 : 2$
3. $1 : 3$
4. $1 : \sqrt{3}$

Question ID : **4165299705**
Option 1 ID : **41652938279**
Option 2 ID : **41652938278**
Option 3 ID : **41652938280**
Option 4 ID : **41652938281**
Status : **Not Answered**
Chosen Option : **--**

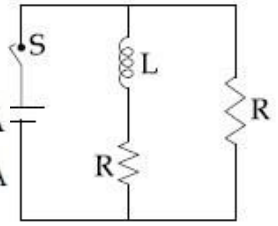
Q.24 Let the moment of inertia of a hollow cylinder of length 30 cm (inner radius 10 cm and outer radius 20 cm), about its axis be I. The radius of a thin cylinder of the same mass such that its moment of inertia about its axis is also I, is :

Options
1. 12 cm
2. 16 cm
3. 14 cm
4. 18 cm

Question ID : **4165299692**
Option 1 ID : **41652938227**
Option 2 ID : **41652938229**
Option 3 ID : **41652938226**
Option 4 ID : **41652938228**
Status : **Not Answered**
Chosen Option : **--**

Q.25

In the figure shown, a circuit contains two identical resistors with resistance $R = 5\ \Omega$ and an inductance with $L = 2\,mH$. An ideal battery of 15 V is connected in the circuit. What will be the current through the battery long after the switch is closed ?

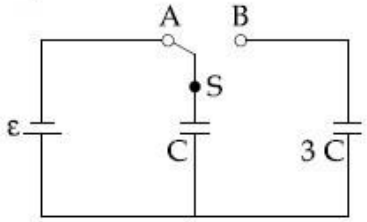


Options

1. 5.5 A
2. 7.5 A
3. 3 A
4. 6 A

Question ID : **4165299706**
Option 1 ID : **41652938282**
Option 2 ID : **41652938283**
Option 3 ID : **41652938285**
Option 4 ID : **41652938284**
Status : **Not Answered**
Chosen Option : **--**

Q.26 In the figure shown, after the switch 'S' is turned from position 'A' to position 'B', the energy dissipated in the circuit in terms of capacitance 'C' and total charge 'Q' is :



Options

1. $\frac{1}{8}\frac{Q^2}{C}$
2. $\frac{3}{8}\frac{Q^2}{C}$
3. $\frac{5}{8}\frac{Q^2}{C}$
4. $\frac{3}{4}\frac{Q^2}{C}$

Question ID : **4165299699**
Option 1 ID : **41652938255**
Option 2 ID : **41652938257**
Option 3 ID : **41652938256**
Option 4 ID : **41652938254**
Status : **Not Answered**
Chosen Option : **--**

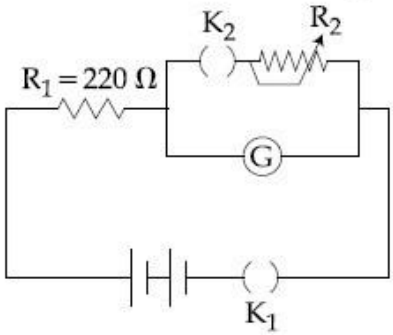
Q.27

A satellite of mass M is in a circular orbit of radius R about the centre of the earth. A meteorite of the same mass, falling towards the earth, collides with the satellite such that it escapes to infinity eeds of the s rite are the same, just b e subsequent motion

Options
1. c
2. s in an elliptical orbit
3. o in the same circular orbit of radius R
4. in a circular orbit of a different radius

Question ID : **4165299690**
Option 1 ID : **41652938221**
Option 2 ID : **41652938220**
Option 3 ID : **41652938218**
Option 4 ID : **41652938219**
Status : **Not Answered**
Chosen Option : **--**

Q.28 The galvanometer deflection, when key K_1 is closed but K_2 is open, equals θ_0 (see figure). On closing K_2 also and adjusting R_2 to 5 Ω, the deflection in galvanometer becomes $\frac{\theta_0}{5}$. The resistance of the galvanometer is, then, given by [Neglect the internal resistance of battery] :



Options
1. 5 Ω
2. 22 Ω
3. 25 Ω
4. 12 Ω

Question ID : **4165299714**
Option 1 ID : **41652938316**
Option 2 ID : **41652938314**
Option 3 ID : **41652938317**
Option 4 ID : **41652938315**
Status : **Not Answered**
Chosen Option : **--**

Q.29

A particle A of mass 'm' and charge 'q' is accelerated by a potential difference of 50 V. Another particle B of mass '4 m' and charge 'q' is accelerated by a potential difference of 2500 V. The ratio of de-Broglie wavelengths $\frac{\lambda_A}{\lambda_B}$ is close to :

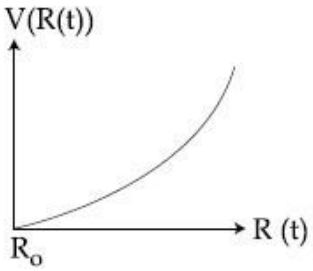
Options

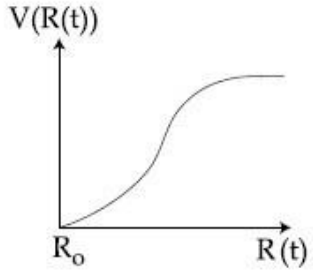
1. 10.00
2. 0.07
3. 14.14
4. 4.47

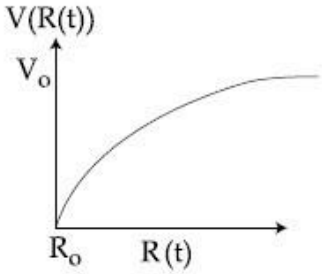
Question ID : **4165299710**
Option 1 ID : **41652938299**
Option 2 ID : **41652938300**
Option 3 ID : **41652938301**
Option 4 ID : **41652938298**
Status : **Not Answered**
Chosen Option : **--**

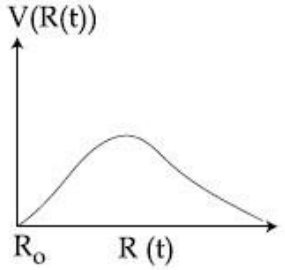
Q.30 There is a uniform spherically symmetric surface charge density at a distance R_o from the origin. The charge distribution is initially at rest and starts expanding because of mutual repulsion. The figure that represents best the speed V(R(t)) of the distribution as a function of its instantaneous radius R(t) is :

Options

1.


2.


3.


4.


Question ID : **4165299701**
Option 1 ID : **41652938262**

Option 2 ID : **41652938265**
Option 3 ID : **41652938264**
Option 4 ID : **41652938263**
Status : **Not Answered**
Chosen Option : **--**

Section: Chemistry

Q.1 In the Hall-Heroult process, aluminium is formed at the cathode. The cathode is made out of :

Options
1. Pure aluminium
2. Carbon
3. Copper
4. Platinum

Question ID : **4165299727**
Option 1 ID : **41652938367**
Option 2 ID : **41652938369**
Option 3 ID : **41652938368**
Option 4 ID : **41652938366**
Status : **Answered**
Chosen Option : **3**

Q.2 The correct order for acid strength of compounds
$CH \equiv CH$, $CH_3-C \equiv CH$ and $CH_2=CH_2$
is as follows :

Options
1. $CH \equiv CH > CH_2=CH_2 > CH_3-C \equiv CH$
2. $CH_3-C \equiv CH > CH \equiv CH > CH_2=CH_2$
3. $CH_3-C \equiv CH > CH_2=CH_2 > HC \equiv CH$
4. $HC \equiv CH > CH_3-C \equiv CH > CH_2=CH_2$

Question ID : **4165299724**
Option 1 ID : **41652938357**
Option 2 ID : **41652938355**
Option 3 ID : **41652938356**
Option 4 ID : **41652938354**
Status : **Answered**
Chosen Option : **1**

Q.3 In a chemical reaction, $A+2B \underset{}{\overset{K}{\rightleftharpoons}} 2C+D$, the initial concentration of B was 1.5 times of the concentration of A, but the equilibrium concentrations of A and B were found to be equal. The equilibrium constant(K) for the aforesaid chemical reaction is :

Options
1. 4
2. 16
3. $\frac{1}{4}$

4. 1

Question ID : **4165299742**
Option 1 ID : **41652938427**
Option 2 ID : **41652938429**
Option 3 ID : **41652938426**
Option 4 ID : **41652938428**
Status : **Not Answered**
Chosen Option : **--**

Q.4 Given

Gas	H_2	CH_4	CO_2	SO_2
Critical Temperature/K	33	190	304	630

On the basis of data given above, predict which of the following gases shows least adsorption on a definite amount of charcoal ?

Options
1. SO_2
2. CH_4
3. CO_2
4. H_2

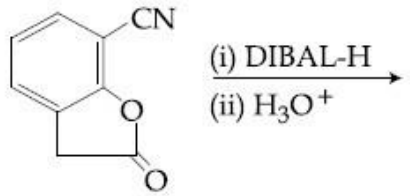
Question ID : **4165299745**
Option 1 ID : **41652938438**
Option 2 ID : **41652938440**
Option 3 ID : **41652938439**
Option 4 ID : **41652938441**
Status : **Answered**
Chosen Option : **2**

Q.5 $Mn_2(CO)_{10}$ is an organometallic compound due to the presence of :

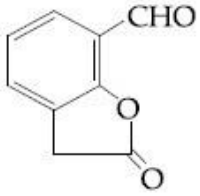
Options
1. Mn – C bond
2. Mn – Mn bond
3. Mn – O bond
4. C – O bond

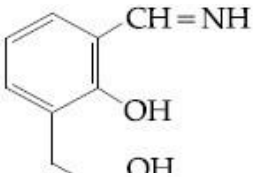
Question ID : **4165299733**
Option 1 ID : **41652938390**
Option 2 ID : **41652938391**
Option 3 ID : **41652938393**
Option 4 ID : **41652938392**
Status : **Not Answered**
Chosen Option : **--**

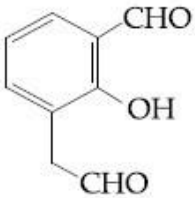
Q.6 The major product of the following reaction is :

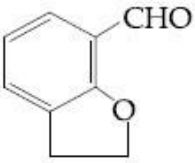


Options

1. 

2. 

3. 

4. 

Question ID : **4165299721**
Option 1 ID : **41652938342**
Option 2 ID : **41652938344**
Option 3 ID : **41652938343**
Option 4 ID : **41652938345**
Status : **Answered**
Chosen Option : **2**

Q.7 A metal on combustion in excess air forms X. X upon hydrolysis with water yields H_2O_2 and O_2 along with another product. The metal is :

Options
1. Na
2. Rb
3. Mg
4. Li

Question ID : **4165299729**
Option 1 ID : **41652938375**
Option 2 ID : **41652938376**
Option 3 ID : **41652938377**
Option 4 ID : **41652938374**
Status : **Answered**
Chosen Option : **3**

Q.8 The molecule that has minimum/no role in the formation of photochemical smog, is :

Options
1. N_2
2. $CH_2=O$
3. O_3
4. NO

Question ID : **4165299735**
Option 1 ID : **41652938399**
Option 2 ID : **41652938401**
Option 3 ID : **41652938398**
Option 4 ID : **41652938400**
Status : **Answered**
Chosen Option : **1**

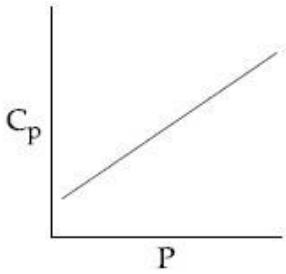
Q.9 The pair of metal ions that can give a spin-only magnetic moment of 3.9 BM for the complex $[M(H_2O)_6]Cl_2$, is :

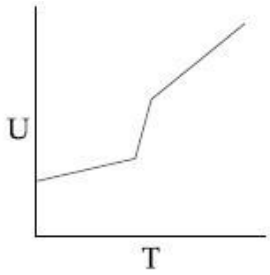
Options
1. V^{2+} and Co^{2+}
2. V^{2+} and Fe^{2+}
3. Co^{2+} and Fe^{2+}
4. Cr^{2+} and Mn^{2+}

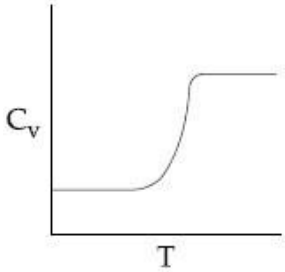
Question ID : **4165299731**
Option 1 ID : **41652938384**
Option 2 ID : **41652938383**
Option 3 ID : **41652938385**
Option 4 ID : **41652938382**
Status : **Answered**
Chosen Option : **2**

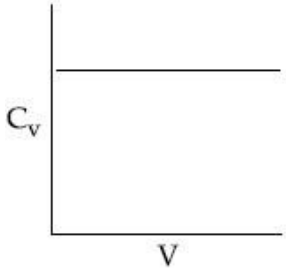
Q.10 For a diatomic ideal gas in a closed system, which of the following plots does not correctly describe the relation between various thermodynamic quantities ?

Options

1. 

2. 

3. 

4. 

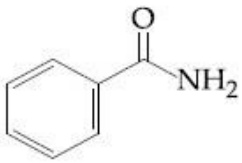
Question ID : **4165299740**
Option 1 ID : **41652938420**
Option 2 ID : **41652938418**
Option 3 ID : **41652938419**
Option 4 ID : **41652938421**
Status : **Marked For Review**
Chosen Option : **3**

Q.11 Among the following compounds most basic amino acid is :

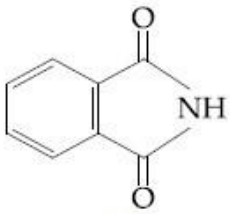
Options
1. Asparagine
2. Lysine
3. Serine
4. Histidine

Question ID : **4165299723**
Option 1 ID : **41652938353**
Option 2 ID : **41652938352**
Option 3 ID : **41652938351**
Option 4 ID : **41652938350**
Status : **Answered**
Chosen Option : **4**

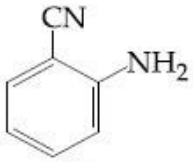
Q.12 The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is :



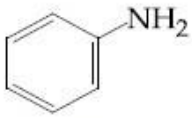
(A)



(B)



(C)



(D)

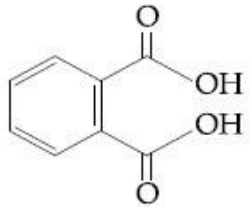
Options
1. (B)<(A)<(C)<(D)
2. (A)<(B)<(C)<(D)
3. (B)<(A)<(D)<(C)
4. (A)<(C)<(D)<(B)

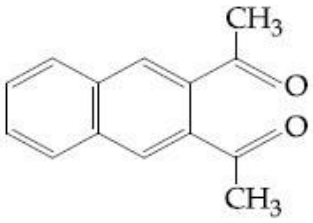
Question ID : **4165299718**
Option 1 ID : **41652938333**

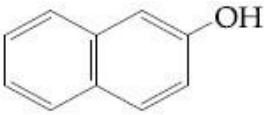
Option 2 ID : **41652938331**
Option 3 ID : **41652938330**
Option 4 ID : **41652938332**
Status : **Answered**
Chosen Option : **3**

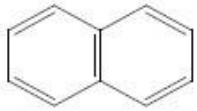
Q.13 Among the following four aromatic compounds, which one will have the lowest melting point ?

Options

1. 

2. 

3. 

4. 

Question ID : **4165299725**
Option 1 ID : **41652938360**
Option 2 ID : **41652938361**
Option 3 ID : **41652938359**
Option 4 ID : **41652938358**
Status : **Not Answered**
Chosen Option : **--**

Q.14 50 mL of 0.5 M oxalic acid is needed to neutralize 25 mL of sodium hydroxide solution. The amount of NaOH in 50 mL of the given sodium hydroxide solution is :

Options
1. 40 g
2. 10 g
3. 20 g
4. 80 g

Question ID : **4165299736**
Option 1 ID : **41652938403**
Option 2 ID : **41652938405**
Option 3 ID : **41652938402**
Option 4 ID : **41652938404**
Status : **Answered**
Chosen Option : **3**

Q.15

The volume of gas A is twice than that of gas B. The compressibility factor of gas A is $3P_A = 2P_B$ than that of gas B at same temperature. The pressures of the gases for $2P_A = 3P_B$ per of moles are :

Options
1. $3P_A = 2P_B$
2. $2P_A = 3P_B$
3. $P_A = 3P_B$
4. $P_A = 2P_B$

Question ID : **4165299737**
Option 1 ID : **41652938409**
Option 2 ID : **41652938408**
Option 3 ID : **41652938407**
Option 4 ID : **41652938406**
Status : **Answered**
Chosen Option : **2**

Q.16 The hardness of a water sample (in terms of equivalents of $CaCO_3$) containing 10^{-3} M $CaSO_4$ is :
(molar mass of $CaSO_4 = 136$ g mol^{-1})

Options
1. 10 ppm
2. 50 ppm
3. 90 ppm
4. 100 ppm

Question ID : **4165299728**
Option 1 ID : **41652938372**
Option 2 ID : **41652938373**
Option 3 ID : **41652938370**
Option 4 ID : **41652938371**
Status : **Answered**
Chosen Option : **3**

Q.17 $CH_3CH_2-C(OH)(Ph)-CH_3$ cannot be prepared by :

Options
1. $CH_3CH_2COCH_3 + PhMgX$
2. $PhCOCH_2CH_3 + CH_3MgX$
3. $PhCOCH_3 + CH_3CH_2MgX$
4. $HCHO + PhCH(CH_3)CH_2MgX$

Question ID : **4165299719**
Option 1 ID : **41652938335**
Option 2 ID : **41652938336**
Option 3 ID : **41652938334**
Option 4 ID : **41652938337**
Status : **Not Answered**
Chosen Option : **--**

Q.18

Freezing point of a 4% aqueous solution of X is equal to freezing point of 12% aqueous solution of Y. If molecular weight of X is A, then molecular weight of Y is :

Options
1. 3A
2. 2A
3. A
4. 4A

Question ID : **4165299741**
Option 1 ID : **41652938424**
Option 2 ID : **41652938423**
Option 3 ID : **41652938422**
Option 4 ID : **41652938425**
Status : **Answered**
Chosen Option : **2**

Q.19 The metal d-orbitals that are directly facing the ligands in $K_3[Co(CN)_6]$ are :

Options
1. d_{xy} and $d_{x^2-y^2}$
2. $d_{x^2-y^2}$ and d_{z^2}
3. d_{xz}, d_{yz} and d_{z^2}
4. d_{xy}, d_{xz} and d_{yz}

Question ID : **4165299732**
Option 1 ID : **41652938386**
Option 2 ID : **41652938389**
Option 3 ID : **41652938388**
Option 4 ID : **41652938387**
Status : **Answered**
Chosen Option : **2**

Q.20 Decomposition of X exhibits a rate constant of 0.05 μg/year. How many years are required for the decomposition of 5 μg of X into 2.5 μg ?

Options
1. 50
2. 25
3. 20
4. 40

Question ID : **4165299744**
Option 1 ID : **41652938435**
Option 2 ID : **41652938436**
Option 3 ID : **41652938434**
Option 4 ID : **41652938437**
Status : **Answered**
Chosen Option : **2**

Q.21

The standard electrode potential $E^{\ominus}$ and its temperature coefficient $\left(\frac{dE^{\ominus}}{dT}\right)$ for a cell are 2 V and -5×10^{-4} VK^{-1} at 300 K respectively. The cell reaction is

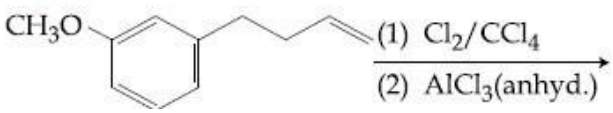
Options

1. -412.8 $Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$
2. -384.0 ndard reaction enthalpy ($\Delta_r H^{\ominus}$) at in kJ mol^{-1} is,
3. 192.0
4. 206.4

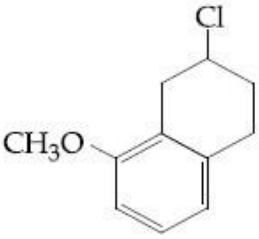
[Use $K = 8 JK^{-1} mol^{-1}$ and $F = 96{,}000 C mol^{-1}$]

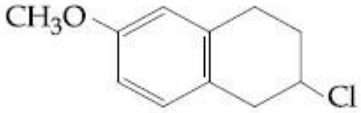
Question ID : **4165299743**
Option 1 ID : **41652938430**
Option 2 ID : **41652938432**
Option 3 ID : **41652938433**
Option 4 ID : **41652938431**
Status : **Not Answered**
Chosen Option : **--**

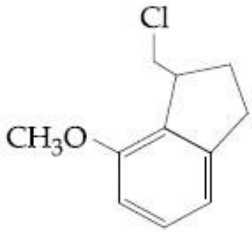
Q.22 The major product of the following reaction is :

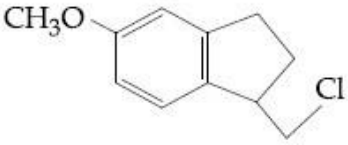


Options

1. 

2. 

3. 

4. 

Question ID : **4165299722**
Option 1 ID : **41652938348**
Option 2 ID : **41652938349**
Option 3 ID : **41652938346**
Option 4 ID : **41652938347**
Status : **Not Answered**
Chosen Option : **--**

Q.23 The element with $Z = 120$ (not yet discovered) will be an/a :

Options
1. inner-transition metal
2. alkaline earth metal
3. alkali metal
4. transition metal

Question ID : **4165299726**
Option 1 ID : **41652938365**
Option 2 ID : **41652938363**
Option 3 ID : **41652938362**
Option 4 ID : **41652938364**
Status : **Answered**
Chosen Option : **2**

Q.24 In the following reaction

$$\text{Aldehyde} + \text{Alcohol} \xrightarrow{HCl} \text{Acetal}$$

Aldehyde	Alcohol
HCHO	^{t}BuOH
CH_3CHO	MeOH

The best combination is :

Options
1. CH_3CHO and ^{t}BuOH
2. HCHO and MeOH
3. CH_3CHO and MeOH
4. HCHO and ^{t}BuOH

Question ID : **4165299717**
Option 1 ID : **41652938328**
Option 2 ID : **41652938326**
Option 3 ID : **41652938329**
Option 4 ID : **41652938327**
Status : **Answered**
Chosen Option : **2**

Q.25 Two solids dissociate as follows

$$A(s) \rightleftharpoons B(g) + C(g); K_{P_1} = x \text{ atm}^2$$

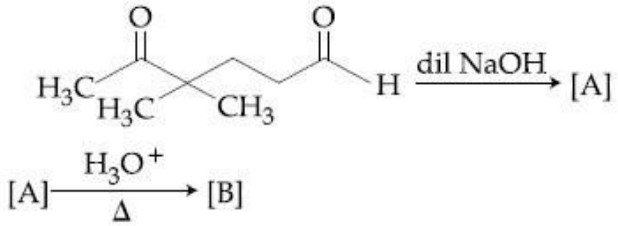
$$D(s) \rightleftharpoons C(g) + E(g); K_{P_2} = y \text{ atm}^2$$

The total pressure when both the solids dissociate simultaneously is :

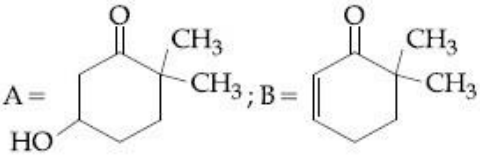
Options
1. $\sqrt{x+y}$ atm
2. $2\left(\sqrt{x+y}\right)$ atm
3. $(x+y)$ atm
4. x^2+y^2 atm

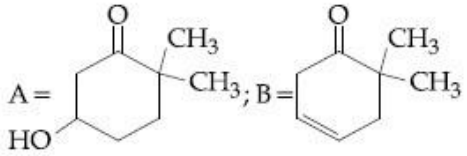
Question ID : **4165299739**
Option 1 ID : **41652938414**
Option 2 ID : **41652938416**
Option 3 ID : **41652938415**
Option 4 ID : **41652938417**
Status : **Answered**
Chosen Option : **2**

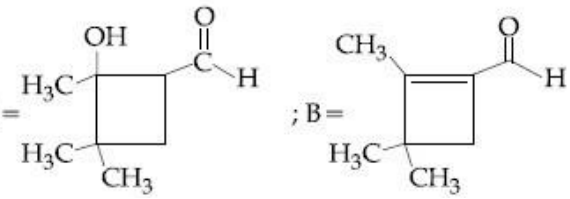
Q.26 In the following reactions, products A and B are :

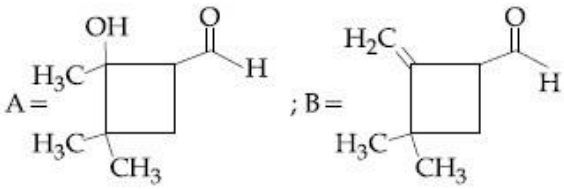


Options

1. A = 

2. A = 

3. A = 

4. A = 

Question ID : **4165299720**
Option 1 ID : **41652938338**
Option 2 ID : **41652938339**
Option 3 ID : **41652938340**
Option 4 ID : **41652938341**
Status : **Answered**
Chosen Option : **3**

Q.27 What is the work function of the metal if the light of wavelength 4000Å generates photoelectrons of velocity 6×10^5 ms^{-1} from it ?

(Mass of electron $= 9 \times 10^{-31}$ kg
Velocity of light $= 3 \times 10^8$ ms^{-1}
Planck's constant $= 6.626 \times 10^{-34}$ Js
Charge of electron $= 1.6 \times 10^{-19}$ JeV^{-1})

Options
1. 0.9 eV
2. 3.1 eV
3. 2.1 eV
4. 4.0 eV

Question ID : **4165299738**
Option 1 ID : **41652938412**

Option 2 ID : **41652938413**
Option 3 ID : **41652938411**
Option 4 ID : **41652938410**
Status : **Answered**
Chosen Option : **2**

Q.28 Iodine reacts with concentrated HNO_3 to yield Y along with other products. The oxidation state of iodine in Y, is :

Options
1. 5
2. 7
3. 3
4. 1

Question ID : **4165299730**
Option 1 ID : **41652938380**
Option 2 ID : **41652938381**
Option 3 ID : **41652938379**
Option 4 ID : **41652938378**
Status : **Answered**
Chosen Option : **3**

Q.29 Poly-β-hydroxybutyrate-co-β-hydroxyvalerate(PHBV) is a copolymer of _____.

Options
1. 3-hydroxybutanoic acid and 4-hydroxypentanoic acid
2. 2-hydroxybutanoic acid and 3-hydroxypentanoic acid
3. 3-hydroxybutanoic acid and 2-hydroxypentanoic acid
4. 3-hydroxybutanoic acid and 3-hydroxypentanoic acid

Question ID : **4165299716**
Option 1 ID : **41652938325**
Option 2 ID : **41652938322**
Option 3 ID : **41652938324**
Option 4 ID : **41652938323**
Status : **Answered**
Chosen Option : **2**

Q.30 Water samples with BOD values of 4 ppm and 18 ppm, respectively, are :

Options
1. Clean and Clean
2. Highly polluted and Clean
3. Clean and Highly polluted
4. Highly polluted and Highly polluted

Question ID : **4165299734**
Option 1 ID : **41652938394**
Option 2 ID : **41652938395**
Option 3 ID : **41652938396**
Option 4 ID : **41652938397**

Status : **Answered**
Chosen Option : **3**

Section: Mathematics

Q.1 An ordered pair (α, β) for which the system of linear equations

$(1+\alpha)x+\beta y+z=2$

$\alpha x+(1+\beta)y+z=3$

$\alpha x+\beta y+2z=2$

has a unique solution, is :

Options
1. $(2, 4)$
2. $(-3, 1)$
3. $(-4, 2)$
4. $(1, -3)$

Question ID : **4165299750**
Option 1 ID : **41652938461**
Option 2 ID : **41652938459**
Option 3 ID : **41652938460**
Option 4 ID : **41652938458**
Status : **Not Answered**
Chosen Option : **--**

Q.2 The product of three consecutive terms of a G.P. is 512. If 4 is added to each of the first and the second of these terms, the three terms now form an A.P. Then the sum of the original three terms of the given G.P. is :

Options
1. 36
2. 32
3. 24
4. 28

Question ID : **4165299753**
Option 1 ID : **41652938470**
Option 2 ID : **41652938471**
Option 3 ID : **41652938473**
Option 4 ID : **41652938472**
Status : **Not Answered**
Chosen Option : **--**

Q.3 The Boolean expression $((p \wedge q) \vee (p \vee \sim q)) \wedge (\sim p \wedge \sim q)$ is equivalent to :

Options
1. $p \wedge q$
2. $p \wedge (\sim q)$
3. $(\sim p) \wedge (\sim q)$
4. $p \vee (\sim q)$

Question ID : **4165299775**

Option 1 ID : **41652938561**
Option 2 ID : **41652938558**
Option 3 ID : **41652938560**
Option 4 ID : **41652938559**
Status : **Not Answered**
Chosen Option : **--**

Q.4 Consider three boxes, each containing 10 balls labelled 1, 2, ... , 10. Suppose one ball is randomly drawn from each of the boxes. Denote by n_i, the label of the ball drawn from the ith box, $(i = 1, 2, 3)$. Then, the number of ways in which the balls can be chosen such that $n_1 < n_2 < n_3$ is :

Options
1. 120
2. 82
3. 240
4. 164

Question ID : **4165299751**
Option 1 ID : **41652938462**
Option 2 ID : **41652938464**
Option 3 ID : **41652938465**
Option 4 ID : **41652938463**
Status : **Not Answered**
Chosen Option : **--**

Q.5 A tetrahedron has vertices P(1, 2, 1), Q(2, 1, 3), R(−1, 1, 2) and O(0, 0, 0). The angle between the faces OPQ and PQR is :

Options
1. $\cos^{-1}\left(\frac{17}{31}\right)$
2. $\cos^{-1}\left(\frac{19}{35}\right)$
3. $\cos^{-1}\left(\frac{9}{35}\right)$
4. $\cos^{-1}\left(\frac{7}{31}\right)$

Question ID : **4165299769**
Option 1 ID : **41652938535**
Option 2 ID : **41652938534**
Option 3 ID : **41652938536**
Option 4 ID : **41652938537**
Status : **Not Answered**
Chosen Option : **--**

Q.6 The maximum area (in sq. units) of a rectangle having its base on the x-axis and its other two vertices on the parabola, $y = 12 - x^2$ such that the rectangle lies inside the parabola, is :

Options
1. 36

$20\sqrt{2}$

32

$18\sqrt{3}$

2.

3.

4.

Question ID : **4165299758**
Option 1 ID : **41652938490**
Option 2 ID : **41652938492**
Option 3 ID : **41652938491**
Option 4 ID : **41652938493**
Status : **Not Answered**
Chosen Option : **--**

Q.7 If the straight line, $2x-3y+17=0$ is perpendicular to the line passing through the points (7, 17) and (15, β), then β equals :

Options

1. $\frac{35}{3}$
2. -5
3. $-\frac{35}{3}$
4. 5

Question ID : **4165299763**
Option 1 ID : **41652938511**
Option 2 ID : **41652938510**
Option 3 ID : **41652938513**
Option 4 ID : **41652938512**
Status : **Answered**
Chosen Option : **1**

Q.8 The sum of the distinct real values of μ, for which the vectors, $\mu\hat{i}+\hat{j}+\hat{k}$, $\hat{i}+\mu\hat{j}+\hat{k}$, $\hat{i}+\hat{j}+\mu\hat{k}$ are co-planar, is :

Options

1. -1
2. 0
3. 1
4. 2

Question ID : **4165299770**
Option 1 ID : **41652938539**
Option 2 ID : **41652938538**
Option 3 ID : **41652938540**
Option 4 ID : **41652938541**
Status : **Not Answered**
Chosen Option : **--**

Q.9

Let P(4, −4) and Q(9, 6) be two points on the parabola, $y^2 = 4x$ and let X be any point on the arc POQ of this parabola, where O is the vertex of this parabola, such that the area of ΔPXQ is maximum. Then this maximum area (in sq. units) is :

Options

1. $\frac{75}{2}$
2. $\frac{125}{4}$
3. $\frac{625}{4}$
4. $\frac{125}{2}$

Question ID : **4165299766**
Option 1 ID : **41652938525**
Option 2 ID : **41652938524**
Option 3 ID : **41652938523**
Option 4 ID : **41652938522**
Status : **Answered**
Chosen Option : **4**

Q.10

Let $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 9 & 3 & 1 \end{bmatrix}$ and $Q = [q_{ij}]$ be two 3×3 matrices such that $Q - P^5 = I_3$. Then $\frac{q_{21} + q_{31}}{q_{32}}$ is equal to :

Options

1. 10
2. 135
3. 15
4. 9

Question ID : **4165299749**
Option 1 ID : **41652938455**
Option 2 ID : **41652938457**
Option 3 ID : **41652938456**
Option 4 ID : **41652938454**
Status : **Not Answered**
Chosen Option : **--**

Q.11

Let $y = y(x)$ be the solution of the differential equation, $x\frac{dy}{dx} + y = x\log_e x$, $(x > 1)$. If $2y(2) = \log_e 4 - 1$, then $y(e)$ is equal to :

Options

1. $-\frac{e}{2}$
2. $-\frac{e^2}{2}$
3. $\frac{e}{4}$

4. $\frac{e^2}{4}$

Question ID : **4165299762**
Option 1 ID : **41652938508**
Option 2 ID : **41652938509**
Option 3 ID : **41652938506**
Option 4 ID : **41652938507**
Status : **Not Answered**
Chosen Option : **--**

Q.12 The area (in sq. units) of the region bounded by the parabola, $y=x^2+2$ and the lines, $y=x+1$, $x=0$ and $x=3$, is :

Options

1. $\frac{15}{4}$
2. $\frac{21}{2}$
3. $\frac{17}{4}$
4. $\frac{15}{2}$

Question ID : **4165299761**
Option 1 ID : **41652938505**
Option 2 ID : **41652938503**
Option 3 ID : **41652938504**
Option 4 ID : **41652938502**
Status : **Not Answered**
Chosen Option : **--**

Q.13 In a random experiment, a fair die is rolled until two fours are obtained in succession. The probability that the experiment will end in the fifth throw of the die is equal to :

Options

1. $\frac{200}{6^5}$
2. $\frac{150}{6^5}$
3. $\frac{225}{6^5}$
4. $\frac{175}{6^5}$

Question ID : **4165299772**
Option 1 ID : **41652938546**
Option 2 ID : **41652938547**
Option 3 ID : **41652938548**
Option 4 ID : **41652938549**
Status : **Answered**
Chosen Option : **3**

Q.14

Let C_1 and C_2 be the centres of the circles $x^2+y^2-2x-2y-2=0$ and $x^2+y^2-6x-6y+14=0$ respectively. If P and Q are the points of intersection of these circles, then the area (in sq. units) of the quadrilateral PC_1QC_2 is :

Options
1. 8
2. 6
3. 9
4. 4

Question ID : **4165299765**
Option 1 ID : **41652938520**
Option 2 ID : **41652938519**
Option 3 ID : **41652938521**
Option 4 ID : **41652938518**
Status : **Not Answered**
Chosen Option : **--**

Q.15 The maximum value of $3\cos\theta + 5\sin\left(\theta - \frac{\pi}{6}\right)$ for any real value of θ is :

Options
1. $\sqrt{19}$
2. $\frac{\sqrt{79}}{2}$
3. $\sqrt{34}$
4. $\sqrt{31}$

Question ID : **4165299773**
Option 1 ID : **41652938551**
Option 2 ID : **41652938550**
Option 3 ID : **41652938553**
Option 4 ID : **41652938552**
Status : **Answered**
Chosen Option : **2**

Q.16 Considering only the principal values of inverse functions, the set

$$A = \left\{x \geq 0 : \tan^{-1}(2x) + \tan^{-1}(3x) = \frac{\pi}{4}\right\}$$

Options
1. contains two elements
2. contains more than two elements
3. is a singleton
4. is an empty set

Question ID : **4165299774**
Option 1 ID : **41652938556**
Option 2 ID : **41652938557**
Option 3 ID : **41652938555**
Option 4 ID : **41652938554**
Status : **Answered**

Chosen Option : **1**

Q.17 If λ be the ratio of the roots of the quadratic equation in x, $3m^2x^2 + m(m-4)x + 2 = 0$, then the least value of m for which $\lambda + \frac{1}{\lambda} = 1$, is :

Options
1. $2 - \sqrt{3}$
2. $4 - 3\sqrt{2}$
3. $-2 + \sqrt{2}$
4. $4 - 2\sqrt{3}$

Question ID : **4165299748**
Option 1 ID : **41652938452**
Option 2 ID : **41652938450**
Option 3 ID : **41652938453**
Option 4 ID : **41652938451**
Status : **Not Answered**
Chosen Option : **--**

Q.18 If a variable line, $3x + 4y - \lambda = 0$ is such that the two circles $x^2 + y^2 - 2x - 2y + 1 = 0$ and $x^2 + y^2 - 18x - 2y + 78 = 0$ are on its opposite sides, then the set of all values of λ is the interval :

Options
1. $(2, 17)$
2. $[13, 23]$
3. $[12, 21]$
4. $(23, 31)$

Question ID : **4165299764**
Option 1 ID : **41652938515**
Option 2 ID : **41652938516**
Option 3 ID : **41652938517**
Option 4 ID : **41652938514**
Status : **Answered**
Chosen Option : **3**

Q.19 For $x > 1$, if $(2x)^{2y} = 4e^{2x-2y}$, then $(1 + \log_e 2x)^2 \frac{dy}{dx}$ is equal to :

Options
1. $\frac{x \log_e 2x - \log_e 2}{x}$
2. $\log_e 2x$
3. $\frac{x \log_e 2x + \log_e 2}{x}$
4. $x \log_e 2x$

Question ID : **4165299756**
Option 1 ID : **41652938484**

Option 2 ID : **41652938483**
Option 3 ID : **41652938482**
Option 4 ID : **41652938485**
Status : **Not Answered**
Chosen Option : **--**

Q.20 The integral $\int \cos(\log_e x)\, dx$ is equal to :

(where C is a constant of integration)

Options

1. $\frac{x}{2}\left[\sin(\log_e x) - \cos(\log_e x)\right] + C$
2. $x\left[\cos(\log_e x) + \sin(\log_e x)\right] + C$
3. $\frac{x}{2}\left[\cos(\log_e x) + \sin(\log_e x)\right] + C$
4. $x\left[\cos(\log_e x) - \sin(\log_e x)\right] + C$

Question ID : **4165299759**
Option 1 ID : **41652938496**
Option 2 ID : **41652938494**
Option 3 ID : **41652938497**
Option 4 ID : **41652938495**
Status : **Answered**
Chosen Option : **3**

Q.21 A ratio of the 5th term from the beginning to the 5th term from the end in the binomial expansion of $\left(2^{1/3} + \frac{1}{2(3)^{1/3}}\right)^{10}$ is :

Options

1. $1 : 2(6)^{\frac{1}{3}}$
2. $1 : 4(16)^{\frac{1}{3}}$
3. $4(36)^{\frac{1}{3}} : 1$
4. $2(36)^{\frac{1}{3}} : 1$

Question ID : **4165299752**
Option 1 ID : **41652938466**
Option 2 ID : **41652938469**
Option 3 ID : **41652938468**
Option 4 ID : **41652938467**
Status : **Not Answered**
Chosen Option : **--**

Q.22

Options 1. $\sum_{k=1}^{283} S_k = \frac{1+2+3+....+k}{k}$. If

2. 301

3. $S_1^2 + S_2^2 + \cdots + S_{10}^2 = \frac{5}{12}A$, then A

4. is 156 ual to :

Question ID : **4165299754**
Option 1 ID : **41652938475**
Option 2 ID : **41652938476**
Option 3 ID : **41652938477**
Option 4 ID : **41652938474**
Status : **Answered**
Chosen Option : **2**

Q.23 The perpendicular distance from the origin to the plane containing the two lines,

$\frac{x+2}{3} = \frac{y-2}{5} = \frac{z+5}{7}$ and

$\frac{x-1}{1} = \frac{y-4}{4} = \frac{z+4}{7}$, is :

Options 1. $11\sqrt{6}$

2. $11/\sqrt{6}$

3. 11

4. $6\sqrt{11}$

Question ID : **4165299768**
Option 1 ID : **41652938531**
Option 2 ID : **41652938532**
Option 3 ID : **41652938530**
Option 4 ID : **41652938533**
Status : **Not Answered**
Chosen Option : **--**

Q.24 If the sum of the deviations of 50 observations from 30 is 50, then the mean of these observations is :

Options 1. 30

2. 51

3. 50

4. 31

Question ID : **4165299771**
Option 1 ID : **41652938544**
Option 2 ID : **41652938543**
Option 3 ID : **41652938542**
Option 4 ID : **41652938545**
Status : **Answered**
Chosen Option : **3**

Q.25

Let S be the set of all points in $(-\pi, \pi)$ at
tion, $f(x) = \min\{\sin x, \cos x\}$
able. Then S is a subset of
llowing ?

Options

1. $\left\{-\frac{\pi}{4}, 0, \frac{\pi}{4}\right\}$
2. $\left\{-\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{3\pi}{4}, \frac{\pi}{4}\right\}$
3. $\left\{-\frac{\pi}{2}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2}\right\}$
4. $\left\{-\frac{3\pi}{4}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{4}\right\}$

Question ID : **4165299757**
Option 1 ID : **41652938489**
Option 2 ID : **41652938487**
Option 3 ID : **41652938486**
Option 4 ID : **41652938488**
Status : **Answered**
Chosen Option : **4**

Q.26 Let f and g be continuous functions on $[0, a]$ such that $f(x) = f(a-x)$ and $g(x) + g(a-x) = 4$, then $\int_0^a f(x)\, g(x)\, dx$ is equal to :

Options

1. $4\int_0^a f(x)\, dx$
2. $\int_0^a f(x)\, dx$
3. $2\int_0^a f(x)\, dx$
4. $-3\int_0^a f(x)\, dx$

Question ID : **4165299760**
Option 1 ID : **41652938500**
Option 2 ID : **41652938498**
Option 3 ID : **41652938499**
Option 4 ID : **41652938501**
Status : **Answered**
Chosen Option : **2**

Q.27 $\lim_{x \to \pi/4} \frac{\cot^3 x - \tan x}{\cos\left(x + \pi/4\right)}$ is :

Options

1. 4
2. $4\sqrt{2}$
3. $8\sqrt{2}$

4. 8

Question ID : **4165299755**
Option 1 ID : **41652938479**
Option 2 ID : **41652938478**
Option 3 ID : **41652938480**
Option 4 ID : **41652938481**
Status : **Not Answered**
Chosen Option : **--**

Q.28 If $\frac{z-\alpha}{z+\alpha}$ $(\alpha \in R)$ is a purely imaginary number and $|z| = 2$, then a value of α is :

Options
1. 2
2. 1
3. $\frac{1}{2}$
4. $\sqrt{2}$

Question ID : **4165299747**
Option 1 ID : **41652938447**
Option 2 ID : **41652938449**
Option 3 ID : **41652938446**
Option 4 ID : **41652938448**
Status : **Answered**
Chosen Option : **1**

Q.29 Let $S = \{1, 2, 3, \ldots, 100\}$. The number of non-empty subsets A of S such that the product of elements in A is even is :

Options
1. $2^{100} - 1$
2. $2^{50}(2^{50} - 1)$
3. $2^{50} - 1$
4. $2^{50} + 1$

Question ID : **4165299746**
Option 1 ID : **41652938442**
Option 2 ID : **41652938444**
Option 3 ID : **41652938443**
Option 4 ID : **41652938445**
Status : **Not Answered**
Chosen Option : **--**

Q.30 If the vertices of a hyperbola be at $(-2, 0)$ and $(2, 0)$ and one of its foci be at $(-3, 0)$, then which one of the following points **does not** lie on this hyperbola ?

Options
1. $\left(-6, 2\sqrt{10}\right)$
2. $\left(2\sqrt{6}, 5\right)$
3. $\left(4, \sqrt{15}\right)$

4. $\left(6, 5\sqrt{2}\right)$

Question ID : **4165299767**
Option 1 ID : **41652938529**
Option 2 ID : **41652938527**
Option 3 ID : **41652938526**
Option 4 ID : **41652938528**
Status : **Not Answered**
Chosen Option : **--**