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State Common Entrance Test Cell,
Maharashtra State

MHT CET 2020 Question Paper

PCM

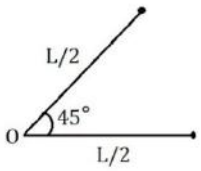
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Q.1 A thin uniform rod of length 'L' and mass 'M' is bent at the middle point 'O' at an angle of 45° as shown in the figure. The moment of inertia of the system about an axis passing through 'O' and perpendicular to the plane of the bent rod, is



Ans

✔ 1. $\frac{ML^2}{12}$

✗ 2. $\frac{ML^2}{24}$

✗ 3. $\frac{ML^2}{3}$

✗ 4. $\frac{ML^2}{6}$

Question Type : **MCQ**
Question ID : **37135116268**
Option 1 ID : **37135165071**
Option 2 ID : **37135165072**
Option 3 ID : **37135165069**
Option 4 ID : **37135165070**
Status : **Answered**
Chosen Option : **1**

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Q.2

The ratio of the specific heats $\frac{C_p}{C_v} = \gamma$ in terms of degrees of freedom 'n' is given by

Ans

1. $\left(1+\frac{n}{2}\right)$

2. $\left(1+\frac{1}{n}\right)$

3. $\left(1+\frac{n}{3}\right)$

4. $\left(1+\frac{2}{n}\right)$

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Question Type : **MCQ**
Question ID : **37135116261**
Option 1 ID : **37135165043**
Option 2 ID : **37135165041**
Option 3 ID : **37135165044**
Option 4 ID : **37135165042**
Status : **Answered**
Chosen Option : **4**

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Q.3 When the observer moves towards a stationary source with velocity V_1, the apparent frequency of emitted note is F_1. When observer moves away from the source with velocity V_1, the apparent frequency is F_2. If V is the velocity of sound in air and $F_1/F_2 = 2$ then V/V_1 is equal to

Ans

1. 5
2. 6
3. 4
4. 3

Question Type : **MCQ**
Question ID : **37135116286**
Option 1 ID : **37135165143**
Option 2 ID : **37135165144**
Option 3 ID : **37135165142**
Option 4 ID : **37135165141**
Status : **Answered**
Chosen Option : **4**

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Q.4 Two parallel wires of equal lengths are separated by a distance of 3m from each other. The currents flowing through first and second wire is 3A and 4.5 A respectively in opposite directions. The resultant magnetic field at mid-point of both the wires is (μ_0 = permeability of free space)

Ans

✗ 1. $\frac{3\mu_0}{2\pi}$

✗ 2. $\frac{7\mu_0}{2\pi}$

✗ 3. $\frac{\mu_0}{2\pi}$

✓ 4. $\frac{5\mu_0}{2\pi}$

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Question Type : **MCQ**
Question ID : **37135116299**
Option 1 ID : **37135165194**
Option 2 ID : **37135165196**
Option 3 ID : **37135165193**
Option 4 ID : **37135165195**
Status : **Answered**
Chosen Option : **2**

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Q.5 The angle made by a vector $\vec{B} = 3\hat{i} + 2\hat{j} + 4\hat{k}$ with y-axis is

Ans

1. $\cos^{-1}\left(\frac{5}{\sqrt{23}}\right)$

2. $\cos^{-1}\left(\frac{4}{\sqrt{11}}\right)$

3. $\cos^{-1}\left(\frac{3}{\sqrt{17}}\right)$

4. $\cos^{-1}\left(\frac{2}{\sqrt{29}}\right)$

22

Question Type : **MCQ**
Question ID : **37135116265**
Option 1 ID : **37135165057**
Option 2 ID : **37135165059**
Option 3 ID : **37135165060**
Option 4 ID : **37135165058**
Status : **Answered**
Chosen Option : **4**

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Q.6 An electron makes a transition from an excited state to the ground state of a hydrogen like atom. Out of the following statements which one is correct?

Ans

✗ 1. K.E., P.E. and T.E. decreases.

✗ 2.

K.E. decreases, P.E. increases but total energy remains the same.

✓ 3.

K.E. increases but P.E. and T.E. decreases.

✗ 4.

K.E. and T.E. decreases but P.E. increases.

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Question Type : **MCQ**
Question ID : **37135116278**
Option 1 ID : **37135165109**
Option 2 ID : **37135165112**
Option 3 ID : **37135165110**
Option 4 ID : **37135165111**
Status : **Answered**
Chosen Option : **2**

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Q.7 In transistor amplifier, base-emitter junction is forward biased and collector emitter junction is reverse biased. The current gain is

Ans

1. $\frac{\Delta I_E}{\Delta I_B}$

2. $\frac{\Delta I_B}{\Delta I_E}$

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3. $\frac{\Delta I_B}{\Delta I_C}$

4. $\frac{\Delta I_C}{\Delta I_B}$

Question Type : **MCQ**
Question ID : **37135116254**
Option 1 ID : **37135165015**
Option 2 ID : **37135165016**
Option 3 ID : **37135165013**
Option 4 ID : **37135165014**
Status : **Answered**
Chosen Option : **2**

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Q.8 The maximum error in the measurement of mass and length is 4% and 3% respectively. The error in the measurement of density of a cube will be

Ans

✗ 1. 9 %

✗ 2. 15 %

✓ 3. 13 %

✗ 4. 6 %

Question Type : **MCQ**
Question ID : **37135116255**
Option 1 ID : **37135165019**
Option 2 ID : **37135165017**
Option 3 ID : **37135165018**
Option 4 ID : **37135165020**
Status : **Answered**
Chosen Option : **1**

Q.9 If two sources emit light waves of different amplitudes then in interference pattern

Ans ✗ 1.

fringes disappear after short time.

✗ 2. brightness of fringes is less.

✓ 3.

there is some intensity of light in the region of destructive interference.

✗ 4. fringe width will be less.

Question Type : **MCQ**
Question ID : **37135116287**
Option 1 ID : **37135165148**
Option 2 ID : **37135165145**
Option 3 ID : **37135165146**
Option 4 ID : **37135165147**
Status : **Answered**
Chosen Option : **1**

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Q.10 The radius of the orbit of a geostationary satellite is (mean radius of the earth is R, angular velocity about an axis in ω and accleration due to gravity on earth's surface is g)

Ans

✔ 1. $\left(\frac{gR^2}{\omega^2}\right)^{1/3}$

✘ 2. $\frac{gR^2}{\omega^2}$

✘ 3. $\left(\frac{gR^2}{\omega^2}\right)^{2/3}$

✘ 4. $\left(\frac{gR^2}{\omega^2}\right)^{1/2}$

2

Question Type : **MCQ**
Question ID : **37135116253**
Option 1 ID : **37135165012**
Option 2 ID : **37135165011**
Option 3 ID : **37135165009**
Option 4 ID : **37135165010**
Status : **Answered**
Chosen Option : **3**

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Q.11 A thin circular ring of mass 'M' and radius 'R' is rotating about a transverse axis passing through its centre with constant angular velocity 'ω'. Two objects each of mass 'm' are attached gently to the opposite ends of a diameter of the ring. What is the new angular velocity?

Ans

✔ 1. $\frac{M\omega}{M+2m}$

✘ 2. $\frac{M\omega}{M+m}$

3

✘ 3. $\frac{(M+2m)\omega}{M}$

✘ 4. $\frac{(M-2m)\omega}{M+2m}$

Question Type : **MCQ**
Question ID : **37135116257**
Option 1 ID : **37135165028**
Option 2 ID : **37135165025**
Option 3 ID : **37135165026**
Option 4 ID : **37135165027**
Status : **Answered**
Chosen Option : **3**

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Q.12 Out of the fundamental forces in nature, maximum and minimum range is respectively for

Ans

1. gravitational force, weak nuclear force.

2. gravitational force, electromagnetic force.

3. strong nuclear force, electromagnetic force.

4. electromagnetic force, gravitational force.

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Question Type : **MCQ**
Question ID : **37135116280**
Option 1 ID : **37135165117**
Option 2 ID : **37135165119**
Option 3 ID : **37135165118**
Option 4 ID : **37135165120**
Status : **Answered**
Chosen Option : **2**

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Q.13 Two unit vectors '$\hat{a}_1$'and '$\hat{a}_2$' are inclined to each other at an angle 'θ'.

If $|\hat{a}_1 - \hat{a}_2| = \sqrt{3}$, then the value of $(\hat{a}_1 - \hat{a}_2)\cdot(2\hat{a}_1 - \hat{a}_2)$ is

Ans

1. $\frac{1}{2}$

2. 2

3. 1

4. $\frac{3}{2}$

22

Question Type : **MCQ**
Question ID : **37135116270**
Option 1 ID : **37135165080**
Option 2 ID : **37135165077**
Option 3 ID : **37135165079**
Option 4 ID : **37135165078**
Status : **Answered**
Chosen Option : **4**

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Q.14 When light of wavelength 'λ' is incident on photosensitive surface, photons of power 'P' are emitted. The number of photons (n) emitted in 't' second is (h= Planck's constant, c= velocity of light in vacuum)

Ans

1. $\frac{hc}{P\lambda t}$

2. $\frac{P\lambda t}{hc}$

3. $\frac{P\lambda}{htc}$

4. $\frac{hP}{\lambda tc}$

17

Question Type : **MCQ**
Question ID : **37135116298**
Option 1 ID : **37135165189**
Option 2 ID : **37135165190**
Option 3 ID : **37135165191**
Option 4 ID : **37135165192**
Status : **Answered**
Chosen Option : **2**

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Q.15 A spring executes S.H.M. with mass 10 kg attached to it. The force constant of the spring is 10 N/m. If at any instant its velocity is 40 cm/s, the displacement at that instant is (Amplitude of S.H.M. = 0.5 m)

Ans

1. 0.3 m

2. 0.2 m

3. 0.4 m

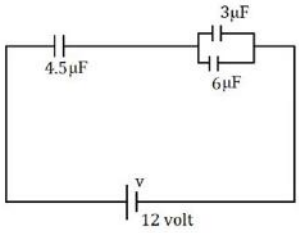
4. 0.45 m

Question Type : **MCQ**
Question ID : **37135116279**
Option 1 ID : **37135165114**
Option 2 ID : **37135165113**
Option 3 ID : **37135165115**
Option 4 ID : **37135165116**
Status : **Answered**
Chosen Option : **3**

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Q.16 In the circuit shown, the potential difference across the 4.5μF capacitor is



12

Ans

1. $\frac{8}{3}$ volt

2. 8 volt

3. 6 volt

4. 4 volt

Question Type : **MCQ**
Question ID : **37135116293**
Option 1 ID : **37135165169**
Option 2 ID : **37135165172**
Option 3 ID : **37135165171**
Option 4 ID : **37135165170**
Status : **Answered**
Chosen Option : **4**

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Q.17 The length of the seconds pendulum is decreased by 0.3 cm when it is shifted from place A to place B. If the acceleration due to gravity at place A is 981 cm/s^2 , the acceleration due to gravity at place B is (Take $\pi^2 = 10$)

Ans



1. $975\ cm/s^2$
2. $978\ cm/s^2$
3. $984\ cm/s^2$
4. $981\ cm/s^2$

Question Type : **MCQ**
Question ID : **37135116272**
Option 1 ID : **37135165088**
Option 2 ID : **37135165086**
Option 3 ID : **37135165087**
Option 4 ID : **37135165085**
Status : **Answered**
Chosen Option : **4**

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Q.18 A galvanometer has resistance 'G' and range 'V_g' . How much resistance is required to read voltage upto 'V' volt?

Ans

1. $\frac{G\,(V+V_g)}{V}$

2. $G\left(\frac{V}{V_g}-1\right)$

3. $\frac{G\,(V-V_g)}{V}$

4. $G\,V_g$

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Question Type : **MCQ**
Question ID : **37135116269**
Option 1 ID : **37135165074**
Option 2 ID : **37135165076**
Option 3 ID : **37135165075**
Option 4 ID : **37135165073**
Status : **Answered**
Chosen Option : **3**

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Q.19 In fundamental mode, the time required for the sound wave to reach upto the closed end of a pipe filled with air is 't' second. The frequency of vibration of air column is

Ans

1. $\frac{1}{3t}$

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

3. $\frac{1}{4t}$

4. $\frac{1}{2t}$

8

Question Type : **MCQ**
Question ID : **37135116274**
Option 1 ID : **37135165094**
Option 2 ID : **37135165096**
Option 3 ID : **37135165093**
Option 4 ID : **37135165095**
Status : **Answered**
Chosen Option : **4**

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Q.20 The relation between total magnetic field (B) , magnetic intensity (H) , permeability of free space (μ_0) and susceptibility (x) is

Ans

1. $\frac{B}{H} = \mu_0(1+x)$

2. $\frac{H}{B} = \mu_0(1-x)$

3. $\frac{B}{H} = \mu_0(1-x)$

4. $\frac{H}{B} = \mu_0(1+x)$

15

Question Type : **MCQ**
Question ID : **37135116262**
Option 1 ID : **37135165045**
Option 2 ID : **37135165048**
Option 3 ID : **37135165047**
Option 4 ID : **37135165046**
Status : **Answered**
Chosen Option : **1**

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Q.21 A solid sphere of mass 'M' and radius 'R' has moment of inertia 'I' about its diameter. It is recast into a disc of thickness 't' whose moment of inertia about an axis passing through its edge and perpendicular to its plane, remains 'I'. Radius of the disc will be

Ans

✗ 1. $R/\sqrt{19}$

✗ 2. $R/\sqrt{15}$

✓ 3. $2R/\sqrt{15}$

✗ 4. $2R/\sqrt{19}$

3

Question Type : **MCQ**
Question ID : **37135116288**
Option 1 ID : **37135165152**
Option 2 ID : **37135165150**
Option 3 ID : **37135165149**
Option 4 ID : **37135165151**
Status : **Answered**
Chosen Option : **2**

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Q.22 In a capactive circuit, the reactance of capacitor at frequency 'f' is 'X_c'. What will be its reactance at frequency 4f?

Ans

1. $\frac{X_c}{2}$
2. $\frac{X_c}{4}$
3. $\frac{X_c}{8}$
4. X_c

16

Question Type : **MCQ**
Question ID : **37135116258**
Option 1 ID : **37135165030**
Option 2 ID : **37135165031**
Option 3 ID : **37135165032**
Option 4 ID : **37135165029**
Status : **Answered**
Chosen Option : **1**

Q.23 The air column in an organ pipe closed at one end is made to vibrate so that there are 2 nodes and antinodes each. The mode of vibration is called

Ans

1. 3^{rd} overtone
2. 1^{st} overtone
3. fundamental
4. 2^{nd} overtone

4

Question Type : **MCQ**
Question ID : **37135116259**
Option 1 ID : **37135165036**
Option 2 ID : **37135165034**
Option 3 ID : **37135165033**
Option 4 ID : **37135165035**
Status : **Answered**
Chosen Option : **2**

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Q.24 The magnifying power of an refracting type of astronomical telescope is 'm'. If focal length of the eyepiece is doubled, the magnifying power will become

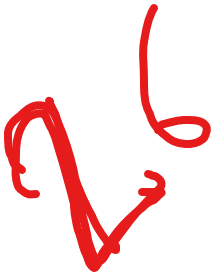
Ans

1. $\frac{m}{4}$

2. $\frac{m}{2}$

3. $2m$

4. m



Question Type : **MCQ**
Question ID : **37135116295**
Option 1 ID : **37135165180**
Option 2 ID : **37135165179**
Option 3 ID : **37135165178**
Option 4 ID : **37135165177**
Status : **Answered**
Chosen Option : **3**

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Q.25 An electron of mass 'm' is revolving around the nucleus in a circular orbit of radius 'r' has angular momentum 'L'. The magnetic field produced by the electron at the centre of the orbit is

(e = electric charge, μ_0 = permeability of free space)

Ans

1. $\frac{\mu_0 eL}{4\pi mr^2}$

2. $\frac{\mu_0 eL}{4\pi mr^3}$

3. $\frac{\mu_0 eL}{2\pi mr^2}$

4. $\frac{\mu_0 eL}{2\pi mr^3}$

Question Type : **MCQ**
Question ID : **37135116281**
Option 1 ID : **37135165122**
Option 2 ID : **37135165123**
Option 3 ID : **37135165124**
Option 4 ID : **37135165121**
Status : **Answered**
Chosen Option : **3**

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Q.26 A liquid kept in a cylindrical vessel is rotated about vertical axis through the centre of circular base. The difference in the heights of the liquid at the centre of vessel and its edge is (R = radius of vessel, ω = angular velocity of rotation, g = acceleration due to gravity)

Ans

✗ 1. $\frac{R^2\omega^2}{g}$

✗ 2. $\frac{R\omega}{g}$

✗ 3. $\frac{R\omega}{2g}$

✓ 4. $\frac{R^2\omega^2}{2g}$

Question Type : **MCQ**
Question ID : **37135116285**
Option 1 ID : **37135165138**
Option 2 ID : **37135165140**
Option 3 ID : **37135165137**
Option 4 ID : **37135165139**
Status : **Answered**
Chosen Option : **2**

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Q.27 A potentiometer wire has length 4m and resistance 5 Ω. It is connected in series with 495 Ω resistance and a cell of e.m.f. 4V. The potential gradient along the wire is

Ans

1. 0.03 V/m
2. 0.01 V/m
3. 0.02 V/m
4. 0.04 V/m

Question Type : **MCQ**
Question ID : **37135116273**
Option 1 ID : **37135165091**
Option 2 ID : **37135165089**
Option 3 ID : **37135165090**
Option 4 ID : **37135165092**
Status : **Answered**
Chosen Option : **2**

Q.28 Two wires A and B having same length and material are stretched by the same force. Their diameters are in the ratio 1 : 3. The ratio of energy density of wire A to that of wire B when stretched , is

Ans

1. 27 : 1
2. 9 : 1
3. 81 : 1
4. 3 : 1

Question Type : **MCQ**
Question ID : **37135116266**
Option 1 ID : **37135165063**
Option 2 ID : **37135165062**
Option 3 ID : **37135165064**
Option 4 ID : **37135165061**
Status : **Answered**
Chosen Option : **2**

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Q.29 A particle moves along a circular path with decreasing speed. Hence

Ans

✗ 1.

its resultant acceleration is towards the centre.

✗ 2.

its angular momentum remains constant.

✓ 3.

the direction of angular momentum remains constant.

✗ 4.

it moves in a spiral path with decreasing radius.

Question Type : **MCQ**
Question ID : **37135116294**
Option 1 ID : **37135165176**
Option 2 ID : **37135165174**
Option 3 ID : **37135165173**
Option 4 ID : **37135165175**
Status : **Answered**
Chosen Option : **3**

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Q.30 A ray of light is incident at an angle of incidence 'i' on one surface of a thin prism of small angle 'A'. The ray emerges normally from the opposite surface. If the refractive index of the material of the prism is 'μ', the angle of incidence 'i' is nearly equal to

Ans

1. $\frac{A}{\mu}$

2. $\frac{\mu A}{2}$

3. μA

4. $\frac{A}{2\mu}$

25

Question Type : **MCQ**
Question ID : **37135116290**
Option 1 ID : **37135165157**
Option 2 ID : **37135165159**
Option 3 ID : **37135165160**
Option 4 ID : **37135165158**
Status : **Answered**
Chosen Option : **4**

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Q.31

In which layer of the atmosphere, the water vapour is present ?

Ans

✔ 1. Troposphere

✘ 2. Ionosphere

✘ 3. Mesosphere

✘ 4. Stratosphere

20

Question Type : **MCQ**
Question ID : **37135116291**
Option 1 ID : **37135165161**
Option 2 ID : **37135165162**
Option 3 ID : **37135165164**
Option 4 ID : **37135165163**
Status : **Answered**
Chosen Option : **4**

Q.32

Scale of galvanometer divided into 100 equal divisions has a current sensitivity 10 div./mA and voltage sensitivity 4 div./mV. The resistance of galvanometer is

Ans

✘ 1. 5 Ω

✔ 2. 2.5 Ω

✘ 3. 10 Ω

✘ 4. 7.5 Ω

14

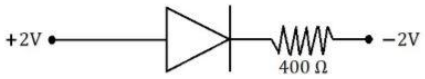
Question Type : **MCQ**
Question ID : **37135116289**
Option 1 ID : **37135165154**
Option 2 ID : **37135165153**
Option 3 ID : **37135165156**
Option 4 ID : **37135165155**
Status : **Answered**
Chosen Option : **2**

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Q.33

For an ideal diode, the current in the following arrangement is



Ans

1. 10 A

2. 10 mA

3. 20 mA

4. 1 mA

19

Question Type : **MCQ**
Question ID : **37135116283**
Option 1 ID : **37135165132**
Option 2 ID : **37135165130**
Option 3 ID : **37135165129**
Option 4 ID : **37135165131**
Status : **Answered**
Chosen Option : **2**

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Q.34

Let 'R_1' and 'R_2' are radii of two mercury drops. A big mercury drop is formed from them under isothermal conditions. The radius of the resultant drop is

Ans

1. $R = \sqrt{R_1^2 - R_2^2}$

2. $R = \frac{R_1 + R_2}{2}$

3. $R = \sqrt{R_1^2 + R_2^2}$

4. $R = (R_1^3 + R_2^3)^{\frac{1}{3}}$

06

Question Type : **MCQ**
Question ID : **37135116263**
Option 1 ID : **37135165050**
Option 2 ID : **37135165052**
Option 3 ID : **37135165049**
Option 4 ID : **37135165051**
Status : **Answered**
Chosen Option : **3**

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Q.35 The magnitude of magnetic fields at a distacne 'r' from the centre of a short bar magnet, in longitudinal position to transverse position is in the ratio

Ans

1. 4 : 1
2. 2 : 1
3. 1 : 4
4. 1 : 2

28

Question Type : **MCQ**
Question ID : **37135116260**
Option 1 ID : **37135165039**
Option 2 ID : **37135165040**
Option 3 ID : **37135165038**
Option 4 ID : **37135165037**
Status : **Answered**
Chosen Option : **2**

Q.36 A body is projected vertically upwards from earth's surface. If its K.E. of projection is equal to half of its minimum value required to escape from the gravitational influence, then the height upto which it rises is (R = radius of the earth)

Ans

1. 4R
2. R
3. 2R
4. 3R

2

Question Type : **MCQ**
Question ID : **37135116282**
Option 1 ID : **37135165128**
Option 2 ID : **37135165125**
Option 3 ID : **37135165126**
Option 4 ID : **37135165127**
Status : **Answered**
Chosen Option : **3**

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Q.37 A black rectangular surface of area A emits energy E per second at 27°C. If length and breadth is reduced to $\left(\frac{1}{3}\right)^{rd}$ of initial value and temperature is raised to 327°C then energy emitted per second becomes

Ans

✗ 1. $2E/9$

✗ 2. $E/9$

✓ 3. $16E/9$

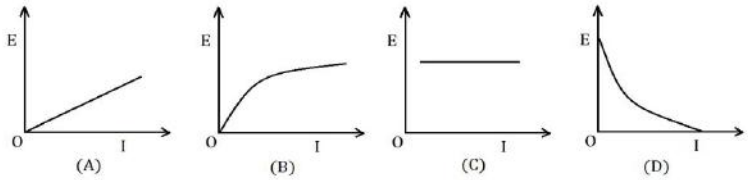
✗ 4. $4E/9$

Question Type : **MCQ**
Question ID : **37135116296**
Option 1 ID : **37135165182**
Option 2 ID : **37135165181**
Option 3 ID : **37135165184**
Option 4 ID : **37135165183**
Status : **Answered**
Chosen Option : **1**

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Q.38 Out of the following graphs, which graph shows the correct variation of maximum kinetic energy (E) of photo electron with intensity of incident radiation (I)?



17

Ans

1. (D)

2. (B)

3. (A)

4. (C)

Question Type : **MCQ**
Question ID : **37135116267**
Option 1 ID : **37135165068**
Option 2 ID : **37135165066**
Option 3 ID : **37135165065**
Option 4 ID : **37135165067**
Status : **Answered**
Chosen Option : **4**

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Q.39 A particle rotates in horizontal circle of radius 'R' in a conical funnel, with speed 'V'. The inner surface of the funnel is smooth. The height of the plane of the circle from the vertex of the funnel is (g = acceleration due to gravity)

Ans

1. $\frac{V^2}{2g}$

2. $\frac{V}{g}$

3. $\frac{V^2}{g}$

4. $\frac{V}{2g}$

Question Type : **MCQ**
Question ID : **37135116277**
Option 1 ID : **37135165108**
Option 2 ID : **37135165106**
Option 3 ID : **37135165107**
Option 4 ID : **37135165105**
Status : **Answered**
Chosen Option : **2**

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Q.40 A metal rod of length L and cross-sectional area A is heated through T °C. What is the force required to prevent the expansion of the rod lengthwise?

(Y= Young's modulus of material of the rod, α = coefficient of linear expansion of the rod.)

Ans

1. $YA\alpha/T\ (1+\alpha T)$
2. $YA\alpha T/\ (1-\alpha T)$
3. $YA\alpha T/\ (1+\alpha T)$
4. $YA\alpha/\ (1-\alpha T)$

Question Type : **MCQ**
Question ID : **37135116297**
Option 1 ID : **37135165187**
Option 2 ID : **37135165186**
Option 3 ID : **37135165185**
Option 4 ID : **37135165188**
Status : **Answered**
Chosen Option : **2**

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Q.41 A copper wire of length 'L' and diameter 'D' is to be reshaped into another wire so as to have minimum resistance. For this we should

Ans

1. increase L and decrease D.

2. decrease L and increase D.

3. decrease both L and D.

4. increase both L and D.

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Question Type : **MCQ**
Question ID : **37135116252**
Option 1 ID : **37135165008**
Option 2 ID : **37135165007**
Option 3 ID : **37135165006**
Option 4 ID : **37135165005**
Status : **Answered**
Chosen Option : **2**

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Q.42 Ratio of centripetal acceleration for an electron revolving in 3rd orbit to 5th Bohr orbit of hydrogen atom is

Ans

✗ 1. $\frac{424}{21}$

✓ 2. $\frac{625}{81}$

✗ 3. $\frac{125}{4}$

✗ 4. $\frac{775}{61}$

18

Question Type : **MCQ**
Question ID : **37135116271**
Option 1 ID : **37135165082**
Option 2 ID : **37135165084**
Option 3 ID : **37135165081**
Option 4 ID : **37135165083**
Status : **Answered**
Chosen Option : **2**

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Q.43 A particle performs S.H.M. from the mean position. Its amplitude is 'A' and total energy is 'E'. At a particular instant its kinetic energy is $\frac{3E}{4}$. The displacement of the particle at that instant is

Ans

1. A

2. $\frac{A}{8}$

3. $\frac{A}{4}$

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

Question Type : **MCQ**
Question ID : **37135116251**
Option 1 ID : **37135165004**
Option 2 ID : **37135165001**
Option 3 ID : **37135165002**
Option 4 ID : **37135165003**
Status : **Answered**
Chosen Option : **3**

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Q.44 A capillary tube is vertically immersed in water, water rises upto a height 'h_1'. When the whole arrangement is taken to a depth 'd' in a mine, the water level rises upto height 'h_2'. The ratio h_1/h_2 is

(R = radius of earth)

Ans

1. $(1+\frac{2d}{R})$

2. $(1-\frac{d}{R})$

3. $(1+\frac{d}{R})$

4. $(1-\frac{2d}{R})$

Question Type : **MCQ**
Question ID : **37135116284**
Option 1 ID : **37135165136**
Option 2 ID : **37135165133**
Option 3 ID : **37135165134**
Option 4 ID : **37135165135**
Status : **Answered**
Chosen Option : **2**

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Q.45 A transverse wave is travelling on a string with velocity 'V'. The extension in the string is 'x'. If the string is extended by 50%, the speed of the wave along the string will be nearly (Hooke's law is obeyed)

Ans

✗ 1. (0.7) V

✓ 2. (1.22) V

✗ 3. (1.1) V

✗ 4. (0.9) V

Question Type : **MCQ**
Question ID : **37135116292**
Option 1 ID : **37135165168**
Option 2 ID : **37135165165**
Option 3 ID : **37135165166**
Option 4 ID : **37135165167**
Status : **Answered**
Chosen Option : **4**

Q.46 The kinetic energy acquired by a body of mass 'M' in travelling a certain distance 'd', starting from rest, under the action of constant force is

Ans

✗ 1. inversely proportional to $\sqrt{M}$.

✗ 2. directly proportional to M.

✓ 3. independent of M.

✗ 4. directly proportional to $\sqrt{M}$.

Question Type : **MCQ**
Question ID : **37135116275**
Option 1 ID : **37135165100**
Option 2 ID : **37135165098**
Option 3 ID : **37135165097**
Option 4 ID : **37135165099**
Status : **Answered**
Chosen Option : **2**

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Q.47 Light waves from two coherent sources arrive at two points on a screen with path difference of zero and $\lambda/2$. The ratio of the intensities at the points is

Ans

✗ 1. two : one

✗ 2. one : two

✗ 3. one : one

✓ 4. infinity : one

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Question Type : **MCQ**
Question ID : **37135116256**
Option 1 ID : **37135165021**
Option 2 ID : **37135165023**
Option 3 ID : **37135165022**
Option 4 ID : **37135165024**
Status : **Answered**
Chosen Option : **2**

Q.48 When unpolarised light is passed through crossed polaroids, then light passing through first polaroid

Ans

✗ 1. also passes through second polaroid.

✗ 2. partially passes through second polaroid.

✓ 3. is blocked by second polaroid.

✗ 4. passes with greater intensity.

10

Question Type : **MCQ**
Question ID : **37135116300**
Option 1 ID : **37135165197**
Option 2 ID : **37135165199**
Option 3 ID : **37135165198**
Option 4 ID : **37135165200**
Status : **Answered**
Chosen Option : **3**

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Q.49 In series LCR circuit, resistance is 18 Ω and impedance is 33 Ω. An r.m.s. voltage of 220 V is applied across the circuit. The true power consumed in a.c. circuit is

Ans

1. 400 V

2. 600 V

3. 800 V

4. 200 V

Question Type : **MCQ**
Question ID : **37135116276**
Option 1 ID : **37135165102**
Option 2 ID : **37135165103**
Option 3 ID : **37135165104**
Option 4 ID : **37135165101**
Status : **Answered**
Chosen Option : **4**

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Q.50 A metal sphere of radius 1 m is charged with 10^{-2}C in air. Its bulk modulus is $10^{11}/4\pi^2$. The volume strain in the sphere is (ϵ_0= pemittivity of free space)

Ans

1. $\frac{10^{-1}}{6\epsilon_0}$

2. $\frac{10^{-14}}{8\epsilon_0}$

3. $\frac{10^{-15}}{8\epsilon_0}$

4. $\frac{10^{-12}}{4\epsilon_0}$

Question Type : **MCQ**
Question ID : **37135116264**
Option 1 ID : **37135165053**
Option 2 ID : **37135165056**
Option 3 ID : **37135165054**
Option 4 ID : **37135165055**
Status : **Answered**
Chosen Option : **2**

Section : **Chemistry**

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Q.1 What is the role of tuyers used in blast furnace for extraction of iron ?

Ans

✗ 1. It enables the even distribution of charge.

✓ 2. To blow a blast of preheated air in to the furnace.

✗ 3. It is used to remove molten slag and iron.

✗ 4. It prevents loss of hot gases.

Question Type : **MCQ**
Question ID : **37135116322**
Option 1 ID : **37135165286**
Option 2 ID : **37135165288**
Option 3 ID : **37135165287**
Option 4 ID : **37135165285**
Status : **Answered**
Chosen Option : **2**

Q.2 Which of the following compounds contain –CO–NH– linkage ?

Ans

✗ 1. Vinylcyanide

✗ 2. Dimethylterephthalate

✓ 3. ∈ caprolactum

✗ 4. Hexamethylenediamine

Question Type : **MCQ**
Question ID : **37135116331**
Option 1 ID : **37135165321**
Option 2 ID : **37135165324**
Option 3 ID : **37135165322**
Option 4 ID : **37135165323**
Status : **Answered**
Chosen Option : **3**

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Q.3 Primary nitroalkanes on boiling with hydrochloric acid undergo hydrolysis to form

Ans

✗ 1. Alcohol and nitrous acid

✓ 2. Carboxylic acid and hydroxyl amine

✗ 3. Aldehyde and hydroxyl amine

✗ 4. Ketone and nitrous acid

Question Type : **MCQ**
Question ID : **37135116311**
Option 1 ID : **37135165241**
Option 2 ID : **37135165244**
Option 3 ID : **37135165243**
Option 4 ID : **37135165242**
Status : **Answered**
Chosen Option : **1**

Q.4 How many moles of acetic acid is obtained in the reaction when one mole glucose is treated with excess acetic anhydride ?

Ans

✓ 1. 5 moles

✗ 2. 3 moles

✗ 3. 4 moles

✗ 4. 2 moles

Question Type : **MCQ**
Question ID : **37135116348**
Option 1 ID : **37135165392**
Option 2 ID : **37135165390**
Option 3 ID : **37135165391**
Option 4 ID : **37135165389**
Status : **Answered**
Chosen Option : **2**

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Q.5 Which from following methods is NOT used to preserve food ?

Ans

✗ 1. Removel of heat

✗ 2. Irradiation

✓ 3. Addition of water

✗ 4. Addition of heat

Question Type : **MCQ**
Question ID : **37135116323**
Option 1 ID : **37135165289**
Option 2 ID : **37135165291**
Option 3 ID : **37135165292**
Option 4 ID : **37135165290**
Status : **Answered**
Chosen Option : **3**

Q.6 What is molecular formula of 3–bromopropene ?

Ans

✗ 1. C_3H_6Br

✗ 2. C_3H_7Br

✓ 3. C_3H_5Br

✗ 4. C_3H_3Br

Question Type : **MCQ**
Question ID : **37135116327**
Option 1 ID : **37135165306**
Option 2 ID : **37135165305**
Option 3 ID : **37135165307**
Option 4 ID : **37135165308**
Status : **Answered**
Chosen Option : **3**

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Q.7 Which of the following conditions indicates the reaction is spontaneous ?

Ans

✗ 1. $\Delta S < 0, \Delta H > 0, \Delta G > 0$ at all temperature

✗ 2. $\Delta S < 0, \Delta H > 0, \Delta G > 0$ at low temperature

✓ 3. $\Delta S > 0, \Delta H < 0, \Delta G < 0$ at all temperature

✗ 4. $\Delta S < 0, \Delta H > 0, \Delta G > 0$ at high temperature

Question Type : **MCQ**
Question ID : **37135116301**
Option 1 ID : **37135165204**
Option 2 ID : **37135165202**
Option 3 ID : **37135165201**
Option 4 ID : **37135165203**
Status : **Answered**
Chosen Option : **3**

Q.8 Which among the following is NOT a mineral of chlorine ?

Ans

✗ 1. Horn silver

✓ 2. Cryolite

✗ 3. Carnalite

✗ 4. Sylvine

Question Type : **MCQ**
Question ID : **37135116316**
Option 1 ID : **37135165264**
Option 2 ID : **37135165263**
Option 3 ID : **37135165261**
Option 4 ID : **37135165262**
Status : **Answered**
Chosen Option : **2**

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Q.9 Which among the following is allylic secondary alcohol ?

Ans

✗ 1. But–2–en–1–ol

✓ 2. But–3–en–2–ol

✗ 3. 2–Methyl but–3–en–2–ol

✗ 4. Prop–2–en–1–ol

Question Type : **MCQ**
Question ID : **37135116334**
Option 1 ID : **37135165336**
Option 2 ID : **37135165334**
Option 3 ID : **37135165335**
Option 4 ID : **37135165333**
Status : **Answered**
Chosen Option : **3**

Q.10 Which of the following reaction does NOT involve replacement of diazonium group ?

Ans

✗ 1. Reaction with potassium iodide

✓ 2. Reaction with aniline

✗ 3. Reaction with cuprous chloride in HCl

✗ 4. Reaction with hypophosphorus acid

Question Type : **MCQ**
Question ID : **37135116328**
Option 1 ID : **37135165310**
Option 2 ID : **37135165312**
Option 3 ID : **37135165311**
Option 4 ID : **37135165309**
Status : **Answered**
Chosen Option : **4**

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Q.11 If one 's', three 'p' and one 'd' atomic orbitals take part in hybridization, then number of hybrid orbitals formed are

Ans

✔ 1. 5

✘ 2. 3

✘ 3. 4

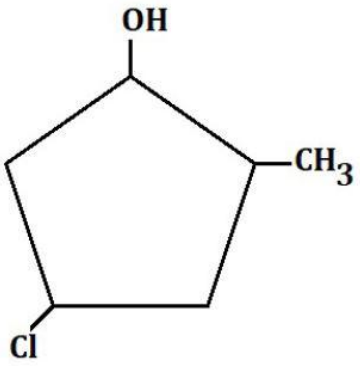
✘ 4. 2

Question Type : **MCQ**
Question ID : **37135116335**
Option 1 ID : **37135165340**
Option 2 ID : **37135165338**
Option 3 ID : **37135165339**
Option 4 ID : **37135165337**
Status : **Answered**
Chosen Option : **4**

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Q.12 What is the IUPAC name of following compound ?



Ans

1. 3 – chloro – 5 – methyl cyclopentanol

2. 1 – chloro – 3 – methyl cyclopentan – 4 – ol

3. 4 – chloro – 2 – methyl cyclopentanol

4. 4 – chloro – 2 – hydroxy –1– methylcyclopentane

Question Type : **MCQ**
Question ID : **37135116318**
Option 1 ID : **37135165270**
Option 2 ID : **37135165269**
Option 3 ID : **37135165271**
Option 4 ID : **37135165272**
Status : **Answered**
Chosen Option : **2**

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Q.13 Which among the following is mineral of Sulphur ?

Ans

✗ 1. Fluorapatite

✗ 2. Carnalite

✓ 3. Cinnabar

✗ 4. Sylvine

Question Type : **MCQ**
Question ID : **37135116305**
Option 1 ID : **37135165217**
Option 2 ID : **37135165219**
Option 3 ID : **37135165220**
Option 4 ID : **37135165218**
Status : **Answered**
Chosen Option : **4**

Q.14 An element with density $2{\cdot}8\ g\ cm^{-3}$ forms fcc unit cell having edge length 4×10^{-8} cm. Calculate molar mass of the element.

Ans

✗ 1. $33{\cdot}0\ g\ mol^{-1}$

✗ 2. $22{\cdot}0\ g\ mol^{-1}$

✓ 3. $27{\cdot}0\ g\ mol^{-1}$

✗ 4. $36{\cdot}0\ g\ mol^{-1}$

Question Type : **MCQ**
Question ID : **37135116340**
Option 1 ID : **37135165359**
Option 2 ID : **37135165357**
Option 3 ID : **37135165358**
Option 4 ID : **37135165360**
Status : **Answered**
Chosen Option : **3**

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Q.15 Vapour pressure of solvent 'A' is 0·90 atm, when a non volatile solute is added, vapour pressure drops to 0·60 atm, what is mole fraction of A in solution ?

Ans

✗ 1. 0·300

✗ 2. 0·333

✗ 3. 0·500

✓ 4. 0·667

Question Type : **MCQ**
Question ID : **37135116314**
Option 1 ID : **37135165254**
Option 2 ID : **37135165253**
Option 3 ID : **37135165255**
Option 4 ID : **37135165256**
Status : **Answered**
Chosen Option : **4**

Q.16 What is the source of an alkane if it's molar mass is 240 g mol^{-1} and the percentage by mass of hydrogen is 15 % ?

Ans

✗ 1. Gasoline

✓ 2. Diesel

✗ 3. Petrol

✗ 4. Coatings on green leaves

Question Type : **MCQ**
Question ID : **37135116344**
Option 1 ID : **37135165375**
Option 2 ID : **37135165376**
Option 3 ID : **37135165373**
Option 4 ID : **37135165374**
Status : **Answered**
Chosen Option : **1**

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Q.17 P_4O_{10} reacts with water to produce

Ans

✗ 1. $H_3P(OH)_3$

✗ 2. H_3PO_3

✓ 3. H_3PO_4

✗ 4. $H_4P(OH)_3$

Question Type : **MCQ**
Question ID : **37135116330**
Option 1 ID : **37135165318**
Option 2 ID : **37135165317**
Option 3 ID : **37135165320**
Option 4 ID : **37135165319**
Status : **Answered**
Chosen Option : **1**

Q.18 The sum of oxidation states of all atoms in $Cr_2O_7^{2-}$ ion is

Ans

✗ 1. Zero

✓ 2. -2

✗ 3. $+2$

✗ 4. -1

Question Type : **MCQ**
Question ID : **37135116317**
Option 1 ID : **37135165266**
Option 2 ID : **37135165268**
Option 3 ID : **37135165265**
Option 4 ID : **37135165267**
Status : **Answered**
Chosen Option : **4**

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Q.19 Chromyl chloride converts methyl group to a chromium complex, which on acid hydrolysis gives corresponding aldehyde. This reaction is called

Ans

1. Stephen reaction
2. Wolff–Kishner reaction
3. Etard reaction
4. Rosenmund reaction

Question Type : **MCQ**
Question ID : **37135116312**
Option 1 ID : **37135165247**
Option 2 ID : **37135165248**
Option 3 ID : **37135165246**
Option 4 ID : **37135165245**
Status : **Answered**
Chosen Option : **3**

Q.20 Which of the following artificial sweetener contain chlorine in it's molecular formula ?

Ans

1. Saccharine
2. Alitame
3. Aspartame
4. Sucrulose

Question Type : **MCQ**
Question ID : **37135116337**
Option 1 ID : **37135165345**
Option 2 ID : **37135165348**
Option 3 ID : **37135165346**
Option 4 ID : **37135165347**
Status : **Answered**
Chosen Option : **1**

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Q.21 If the conductivity of 0·08 M KCl solution is $2 \times 10^{-2}\ \Omega^{-1}$, what is the molar conductivity of the solution ?

Ans

1. $350\ \Omega^{-1}cm^2mol^{-1}$
2. $250\ \Omega^{-1}cm^2mol^{-1}$
3. $25{\cdot}0\ \Omega^{-1}cm^2mol^{-1}$
4. $0{\cdot}25\ \Omega^{-1}cm^2mol^{-1}$

Question Type : **MCQ**
Question ID : **37135116347**
Option 1 ID : **37135165388**
Option 2 ID : **37135165387**
Option 3 ID : **37135165386**
Option 4 ID : **37135165385**
Status : **Answered**
Chosen Option : **2**

Q.22 Which of the following alcohols is NOT prepared by acid catalyzed hydration of alkenes ?

Ans

1. Ethanol
2. Propan–2–ol
3. Propan–1–ol
4. 2–Methyl propan–2–ol

Question Type : **MCQ**
Question ID : **37135116308**
Option 1 ID : **37135165229**
Option 2 ID : **37135165232**
Option 3 ID : **37135165231**
Option 4 ID : **37135165230**
Status : **Answered**
Chosen Option : **4**

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Q.23 Which from following complexes, the central metal ion does NOT obey EAN rule ?
(Atomic number – Pt=78, Cu=29, Zn=30, Fe=26)

Ans

✗ 1. $[Zn(NH_3)_4]^{2+}$

✓ 2. $[Cu(NH_3)_4]^{2+}$

✗ 3. $[Pt(NH_3)_6]^{4+}$

✗ 4. $[Fe(CN)_6]^{4-}$

Question Type : **MCQ**
Question ID : **37135116324**
Option 1 ID : **37135165295**
Option 2 ID : **37135165294**
Option 3 ID : **37135165293**
Option 4 ID : **37135165296**
Status : **Answered**
Chosen Option : **2**

Q.24 The rate constant for first order reaction is $0{\cdot}02232\ min^{-1}$. Calculate the time required for 75 % completion of the reaction.

Ans

✓ 1. 62·12 min

✗ 2. 38·31 min

✗ 3. 12·77 min

✗ 4. 48·12 min

Question Type : **MCQ**
Question ID : **37135116350**
Option 1 ID : **37135165400**
Option 2 ID : **37135165398**
Option 3 ID : **37135165397**
Option 4 ID : **37135165399**
Status : **Answered**
Chosen Option : **2**

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Q.25 What is IUPAC name of $[CoCl_2(en)_2]^+$?

Ans
✔ 1. Bis (ethylenediammine) dichloro cobalt (III) ion

✗ 2. Dichloro ethylenediamine cobalt (I)

✗ 3. Ethylene diamine cobalt (I) dichloride

✗ 4. Ethylene diamine cobalt chloride

Question Type : **MCQ**
Question ID : **37135116303**
Option 1 ID : **37135165211**
Option 2 ID : **37135165210**
Option 3 ID : **37135165212**
Option 4 ID : **37135165209**
Status : **Answered**
Chosen Option : **1**

Q.26 What is the electronic configuration of third element of group-2 in periodic table ?

Ans
✗ 1. $[Ne]\ 3S^1$

✗ 2. $[Ne]\ 3S^2$

✗ 3. $[Ar]\ 4S^1$

✔ 4. $[Ar]\ 4S^2$

Question Type : **MCQ**
Question ID : **37135116307**
Option 1 ID : **37135165225**
Option 2 ID : **37135165227**
Option 3 ID : **37135165226**
Option 4 ID : **37135165228**
Status : **Answered**
Chosen Option : **4**

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Q.27 An element crystallises in a fcc lattice with cell edge 250 pm. Calculate the density of an element (at.mass=90·3)

Ans

✗ 1. $23{\cdot}12\ g\ cm^{-3}$

✗ 2. $19{\cdot}20\ g\ cm^{-3}$

✗ 3. $48{\cdot}40\ g\ cm^{-3}$

✓ 4. $38{\cdot}40\ g\ cm^{-3}$

Question Type : **MCQ**
Question ID : **37135116349**
Option 1 ID : **37135165394**
Option 2 ID : **37135165393**
Option 3 ID : **37135165396**
Option 4 ID : **37135165395**
Status : **Answered**
Chosen Option : **2**

Q.28 What is the quantity of heat evolved when 6 g carbon combines with sulphur to form CS_2 according to the reaction

$C + S_2 \rightarrow CS_2 \quad \Delta H = -92\ KJ\ mol^{-1}$

Ans

✗ 1. 22 KJ

✗ 2. 32 KJ

✓ 3. 46 KJ

✗ 4. 11 KJ

Question Type : **MCQ**
Question ID : **37135116343**
Option 1 ID : **37135165370**
Option 2 ID : **37135165371**
Option 3 ID : **37135165372**
Option 4 ID : **37135165369**
Status : **Answered**
Chosen Option : **2**

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Q.29 The volume of dihydrogen required for complete hydrogenation of 0·5 dm^3 of ethene at S.T.P. is

Ans

✗ 1. $1{\cdot}0\ dm^3$

✓ 2. $0{\cdot}5\ dm^3$

✗ 3. $0{\cdot}75\ dm^3$

✗ 4. $0{\cdot}25\ dm^3$

Question Type : **MCQ**
Question ID : **37135116336**
Option 1 ID : **37135165344**
Option 2 ID : **37135165342**
Option 3 ID : **37135165343**
Option 4 ID : **37135165341**
Status : **Answered**
Chosen Option : **4**

Q.30 How many electrons flow when a current of 5 amp is passed through a cell for 200 sec ?

Ans

✗ 1. $9{\cdot}65 \times 10^{21}$

✗ 2. $1{\cdot}60 \times 10^{21}$

✗ 3. $3{\cdot}12 \times 10^{21}$

✓ 4. $6{\cdot}24 \times 10^{21}$

Question Type : **MCQ**
Question ID : **37135116313**
Option 1 ID : **37135165252**
Option 2 ID : **37135165249**
Option 3 ID : **37135165250**
Option 4 ID : **37135165251**
Status : **Answered**
Chosen Option : **2**

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Q.31 Which of the following is an example of hydrophobic sol ?

Ans

✗ 1. Rubber in benzene

✗ 2. Cellulose acetate in acetone

✓ 3. Metal sulphide

✗ 4. Starch in water

Question Type : **MCQ**
Question ID : **37135116319**
Option 1 ID : **37135165276**
Option 2 ID : **37135165273**
Option 3 ID : **37135165275**
Option 4 ID : **37135165274**
Status : **Answered**
Chosen Option : **4**

Q.32 What is IUPAC name of acrolein ?

Ans

✓ 1. Prop–2–enal

✗ 2. 2–methyl but–2–enal

✗ 3. 3–methyl but–2–enal

✗ 4. But–2–enal

Question Type : **MCQ**
Question ID : **37135116346**
Option 1 ID : **37135165381**
Option 2 ID : **37135165383**
Option 3 ID : **37135165384**
Option 4 ID : **37135165382**
Status : **Answered**
Chosen Option : **3**

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Q.33 What is the formula of pyrolusite ore ?

Ans

✗ 1. $PbCrO_4$

✗ 2. Cu_2O

✗ 3. Cr_2O_3

✓ 4. MnO_2

Question Type : **MCQ**
Question ID : **37135116332**
Option 1 ID : **37135165327**
Option 2 ID : **37135165328**
Option 3 ID : **37135165326**
Option 4 ID : **37135165325**
Status : **Answered**
Chosen Option : **1**

Q.34 Aluminium crystallises in a face centred cubic structure, it's atomic radius is 125 pm. What is the edge length of unit cell ?

Ans

✗ 1. 280 pm

✓ 2. 353·5 pm

✗ 3. 335·5 pm

✗ 4. 288·6 pm

Question Type : **MCQ**
Question ID : **37135116333**
Option 1 ID : **37135165329**
Option 2 ID : **37135165332**
Option 3 ID : **37135165331**
Option 4 ID : **37135165330**
Status : **Answered**
Chosen Option : **2**

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Q.35 Which of the following elements exhibits oxidation states other than +3 ?

Ans

✔ 1. Ce

✘ 2. Gd

✘ 3. Lu

✘ 4. La

Question Type : **MCQ**
Question ID : **37135116338**
Option 1 ID : **37135165349**
Option 2 ID : **37135165351**
Option 3 ID : **37135165352**
Option 4 ID : **37135165350**
Status : **Answered**
Chosen Option : **1**

Q.36 The IUPAC name of isobutyl bromide is

Ans

✘ 1. 2–methyl–1–bromo propane

✔ 2. 1–bromo–2–methyl propane

✘ 3. 2–bromo–2–methyl propane

✘ 4. 2–bromo–1–methyl propane

Question Type : **MCQ**
Question ID : **37135116310**
Option 1 ID : **37135165238**
Option 2 ID : **37135165239**
Option 3 ID : **37135165240**
Option 4 ID : **37135165237**
Status : **Answered**
Chosen Option : **2**

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Q.37 What is molecular formula of allyl chloride ?

Ans

✗ 1. C_3H_3Cl

✓ 2. C_3H_5Cl

✗ 3. C_3H_7Cl

✗ 4. C_3H_6Cl

Question Type : **MCQ**
Question ID : **37135116321**
Option 1 ID : **37135165284**
Option 2 ID : **37135165282**
Option 3 ID : **37135165281**
Option 4 ID : **37135165283**
Status : **Answered**
Chosen Option : **4**

Q.38 Which of the following molecule does not obey octet rule ?

Ans

✗ 1. N_2

✗ 2. $NaCl$

✗ 3. Cl_2

✓ 4. SF_6

Question Type : **MCQ**
Question ID : **37135116342**
Option 1 ID : **37135165368**
Option 2 ID : **37135165367**
Option 3 ID : **37135165365**
Option 4 ID : **37135165366**
Status : **Answered**
Chosen Option : **4**

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Q.39 Which among the following oxides is amphoteric in nature ?

Ans

✗ 1. Cl_2O_7

✗ 2. CaO

✗ 3. B_2O_3

✔ 4. SnO

Question Type : **MCQ**
Question ID : **37135116325**
Option 1 ID : **37135165300**
Option 2 ID : **37135165298**
Option 3 ID : **37135165299**
Option 4 ID : **37135165297**
Status : **Answered**
Chosen Option : **3**

Q.40 Identify 'A' and 'B' respectively in following reaction

$$\text{Toluene} \xrightarrow[h\nu]{Cl_2} A \xrightarrow[\Delta]{H_2O} B$$

Ans

✗ 1.

Benzoyl chloride and benzoic acid

✗ 2.

Benzoyl chloride and benzaldehyde

✗ 3.

Benzyl chloride and benzoic acid

✔ 4.

Benzyl chloride and benzaldehyde

Question Type : **MCQ**
Question ID : **37135116339**
Option 1 ID : **37135165356**
Option 2 ID : **37135165353**
Option 3 ID : **37135165354**
Option 4 ID : **37135165355**
Status : **Marked For Review**
Chosen Option : **2**

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Q.41 The reaction $N_2O_5 \longrightarrow 2NO_2 + \frac{1}{2} O_2$ is first order in N_2O_5 having rate constant $6{\cdot}2\times 10^{-4} s^{-1}$. What is the value of rate of reaction when concentration of N_2O_5 is 1·25 mol L^{-1} ?

Ans

✔ 1. $7{\cdot}75 \times 10^{-4}$ mol L^{-1} s^{-1}

✘ 2. $8{\cdot}15 \times 10^{-4}$ mol L^{-1} s^{-1}

✘ 3. $4{\cdot}96 \times 10^{-4}$ mol L^{-1} s^{-1}

✘ 4. $2{\cdot}01 \times 10^{-4}$ mol L^{-1} s^{-1}

Question Type : **MCQ**
Question ID : **37135116341**
Option 1 ID : **37135165363**
Option 2 ID : **37135165364**
Option 3 ID : **37135165362**
Option 4 ID : **37135165361**
Status : **Answered**
Chosen Option : **2**

Q.42 Which of the following properties is of thermoplastic polymer ?

Ans

✘ 1. These can't be recycled.

✔ 2.

These are either linear or branched chain polymers.

✘ 3. These can't be remoulded.

✘ 4.

These do not become soft on heating.

Question Type : **MCQ**
Question ID : **37135116304**
Option 1 ID : **37135165216**
Option 2 ID : **37135165214**
Option 3 ID : **37135165215**
Option 4 ID : **37135165213**
Status : **Answered**
Chosen Option : **2**

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Q.43 The molecular mass of an organic monobasic acid is 129 and value of n is 2, what is empirical formula mass of compound ?

Ans

✗ 1. 158·0

✗ 2. 193·5

✓ 3. 64·5

✗ 4. 258

Question Type : **MCQ**
Question ID : **37135116320**
Option 1 ID : **37135165280**
Option 2 ID : **37135165279**
Option 3 ID : **37135165278**
Option 4 ID : **37135165277**
Status : **Answered**
Chosen Option : **1**

Q.44 What is the value of K_f if 30 g urea (molar mass 60) dissolved in 0·5 dm^3 of water decreases freezing point by 0·15°C ?

Ans

✓ 1. $0{\cdot}15\ K\ kg\ mol^{-1}$

✗ 2. $0{\cdot}030\ K\ kg\ mol^{-1}$

✗ 3. $0{\cdot}30\ K\ kg\ mol^{-1}$

✗ 4. $0{\cdot}015\ K\ kg\ mol^{-1}$

Question Type : **MCQ**
Question ID : **37135116345**
Option 1 ID : **37135165378**
Option 2 ID : **37135165380**
Option 3 ID : **37135165379**
Option 4 ID : **37135165377**
Status : **Answered**
Chosen Option : **2**

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Q.45 An aqueous solution of sodium nitrite on boiling with α – chlorosodium propionate gives

Ans

✗ 1. 1–Nitropropane

✓ 2. Nitroethane

✗ 3. 2–Nitropropane

✗ 4. Nitromethane

Question Type : **MCQ**
Question ID : **37135116302**
Option 1 ID : **37135165207**
Option 2 ID : **37135165206**
Option 3 ID : **37135165208**
Option 4 ID : **37135165205**
Status : **Answered**
Chosen Option : **3**

Q.46 What is the molality of a solution containing 300 mg of urea (molar mass 60) dissolved in 30 g of water ?

Ans

✗ 1. 0·133 m

✗ 2. 0·825 m

✗ 3. 0·498 m

✓ 4. 0·166 m

Question Type : **MCQ**
Question ID : **37135116306**
Option 1 ID : **37135165221**
Option 2 ID : **37135165224**
Option 3 ID : **37135165223**
Option 4 ID : **37135165222**
Status : **Answered**
Chosen Option : **3**

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Q.47 Identify the number of oxygen atoms present in saccharic acid ?

Ans

✔ 1. 8

✘ 2. 12

✘ 3. 4

✘ 4. 6

Question Type : **MCQ**
Question ID : **37135116315**
Option 1 ID : **37135165258**
Option 2 ID : **37135165260**
Option 3 ID : **37135165257**
Option 4 ID : **37135165259**
Status : **Answered**
Chosen Option : **2**

Q.48 What is the approximate ratio of roasted ore, coke and lime stone respectively in the charge to be added into blast furnace for extraction of iron ?

Ans

✘ 1. 5 : 12 : 3

✘ 2. 12 : 3 : 5

✔ 3. 12 : 5 : 3

✘ 4. 5 : 3 : 12

Question Type : **MCQ**
Question ID : **37135116329**
Option 1 ID : **37135165315**
Option 2 ID : **37135165314**
Option 3 ID : **37135165313**
Option 4 ID : **37135165316**
Status : **Answered**
Chosen Option : **2**

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Q.49 Relation between ΔH and ΔU for the reaction

$2SO_{3(g)} \longrightarrow 2SO_{2(g)} + O_{2(g)}$ is

Ans

1. $\Delta H - \Delta U = 2RT$
2. $\Delta H - \Delta U = RT$
3. $\Delta H + \Delta U = -RT$
4. $\Delta H + \Delta U = RT$

Question Type : **MCQ**
Question ID : **37135116309**
Option 1 ID : **37135165236**
Option 2 ID : **37135165233**
Option 3 ID : **37135165235**
Option 4 ID : **37135165234**
Status : **Answered**
Chosen Option : **2**

Q.50 At what new pressure 100 mL of a gas at pressure of 720 mm will occupy volume of 84 mL keeping temperature constant ?

Ans

1. 857·14 mm
2. 712·14 mm
3. 816·60 mm
4. 604·82 mm

Question Type : **MCQ**
Question ID : **37135116326**
Option 1 ID : **37135165304**
Option 2 ID : **37135165302**
Option 3 ID : **37135165303**
Option 4 ID : **37135165301**
Status : **Answered**
Chosen Option : **2**

Section : **Mathematics**

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Q.1

$$\int \left[log(1+\cos x) - x\, tan\left(\frac{x}{2}\right)\right] dx =$$

Ans

✗ 1. $x\, log|x| + c$

✗ 2. $x\, log|1 + sinx| + c$

✗ 3. $x\, log|tan\frac{x}{2}| + c$

✓ 4. $x\, log|1 + cosx| + c$

Question Type : **MCQ**
Question ID : **37135116395**
Option 1 ID : **37135165577**
Option 2 ID : **37135165580**
Option 3 ID : **37135165578**
Option 4 ID : **37135165579**
Status : **Answered**
Chosen Option : **2**

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Q.2 If the population grows at the rate 5% per year, then the time taken for the population to become double is (Given $log2=0.6912$)

Ans

1. 13.8275 years

2. 13.624 years

3. 13.725 years

4. 13.8240 years

Question Type : **MCQ**
Question ID : **37135116354**
Option 1 ID : **37135165416**
Option 2 ID : **37135165413**
Option 3 ID : **37135165414**
Option 4 ID : **37135165415**
Status : **Answered**
Chosen Option : **4**

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Q.3 The area bounded by the circle $x^2 + y^2 = 16$ and lines $x = 0$ and $x = 2$ is

Ans

✔ 1. $\left[4\sqrt{3} + \frac{8\pi}{3}\right]$ sq. units

✘ 2. $\frac{1}{2}\left[4\sqrt{3} + \frac{8\pi}{3}\right]$ sq. units

✘ 3. $\left[4\sqrt{3} - \frac{8\pi}{3}\right]$ sq. units

✘ 4. $\frac{1}{2}\left[4\sqrt{3} - \frac{8\pi}{3}\right]$ sq. units

Question Type : **MCQ**
Question ID : **37135116392**
Option 1 ID : **37135165566**
Option 2 ID : **37135165565**
Option 3 ID : **37135165567**
Option 4 ID : **37135165568**
Status : **Answered**
Chosen Option : **1**

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Q.4

$$\int_0^{\pi} \frac{x\cos x \cdot \sin x}{\cos^3 x + \cos x}\, dx =$$

Ans

1. $\frac{\pi}{4}$

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

3. $\frac{\pi}{8}$

4. $\frac{\pi^2}{8}$

Question Type : **MCQ**
Question ID : **37135116385**
Option 1 ID : **37135165538**
Option 2 ID : **37135165537**
Option 3 ID : **37135165540**
Option 4 ID : **37135165539**
Status : **Answered**
Chosen Option : **2**

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Q.5 Given $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 4, 5\}$. If R is a relation from A to B such that $(x, y) \in R$ with $x > y$, then range of R is

Ans

1. $\{1, 4\}$

2. $\{4, 5\}$

3. $\{1, 4, 5\}$

4. $\{2, 4\}$

Question Type : **MCQ**
Question ID : **37135116353**
Option 1 ID : **37135165410**
Option 2 ID : **37135165409**
Option 3 ID : **37135165411**
Option 4 ID : **37135165412**
Status : **Answered**
Chosen Option : **3**

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Q.6 The equation of a plane passing through the intersection of two planes $x + 2y - 3z + 2 = 0$ and $6x + y + z + 1 = 0$ and parallel to the line $x - 1 = y + 2 = 7 - z$ is

Ans

✗ 1. $5x - y + 4z + 1 = 0$

✗ 2. $5x + y + 4z + 1 = 0$

✓ 3. $5x - y + 4z = 1$

✗ 4. $5x + y + 4z = 1$

Question Type : **MCQ**
Question ID : **37135116373**
Option 1 ID : **37135165490**
Option 2 ID : **37135165489**
Option 3 ID : **37135165491**
Option 4 ID : **37135165492**
Status : **Answered**
Chosen Option : **1**

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Q.7

The value of x such that the matrix $\begin{bmatrix} x & 2 & 3 \\ 4 & 5 & 6 \\ 2 & 3 & 5 \end{bmatrix}$ is not invertible is

Ans

✗ 1. $\frac{-10}{7}$

✗ 2. $\frac{7}{10}$

✗ 3. $\frac{-7}{10}$

✓ 4. $\frac{10}{7}$

Question Type : **MCQ**
Question ID : **37135116357**
Option 1 ID : **37135165427**
Option 2 ID : **37135165426**
Option 3 ID : **37135165425**
Option 4 ID : **37135165428**
Status : **Answered**
Chosen Option : **4**

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Q.8

If $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$, then

Ans

1. A is not invertible

2. $A = A^{-1}$

3. $A^{-1} = 2A$

4. $A^{-1} = I$

Question Type : **MCQ**
Question ID : **37135116369**
Option 1 ID : **37135165474**
Option 2 ID : **37135165476**
Option 3 ID : **37135165473**
Option 4 ID : **37135165475**
Status : **Answered**
Chosen Option : **2**

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Q.9

$$\int \frac{sinx}{sin\left(x-\frac{\pi}{4}\right)}\,dx =$$

Ans

1. $\frac{1}{\sqrt{2}}\left[x+log\left|sin\left(x-\frac{\pi}{4}\right)\right|\right]+c$

2. $x+log\left|sin\left(x-\frac{\pi}{4}\right)\right|+c$

3. $x-log\left|sin\left(x-\frac{\pi}{4}\right)\right|+c$

4. $\frac{1}{\sqrt{2}}\left[x-log\left|sin\left(x-\frac{\pi}{4}\right)\right|\right]+c$

Question Type : **MCQ**
Question ID : **37135116386**
Option 1 ID : **37135165544**
Option 2 ID : **37135165543**
Option 3 ID : **37135165541**
Option 4 ID : **37135165542**
Status : **Answered**
Chosen Option : **1**

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Q.10 If $(\sim p \wedge q) \rightarrow r$ is false then the truth values of p, q, r are respectively

Ans

✔ 1. F, T, F

✘ 2. F, T, T

✘ 3. T, T, F

✘ 4. F, F, T

Question Type : **MCQ**
Question ID : **37135116381**
Option 1 ID : **37135165524**
Option 2 ID : **37135165522**
Option 3 ID : **37135165521**
Option 4 ID : **37135165523**
Status : **Answered**
Chosen Option : **1**

Q.11 In a triangle ABC with usual notations, if tan A, tan B, tan C are in H.P., then a^2, b^2, c^2 are in

Ans

✔ 1. A. P.

✘ 2. Not in A. P.

✘ 3. H. P

✘ 4. G. P.

Question Type : **MCQ**
Question ID : **37135116358**
Option 1 ID : **37135165429**
Option 2 ID : **37135165432**
Option 3 ID : **37135165431**
Option 4 ID : **37135165430**
Status : **Answered**
Chosen Option : **1**

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Q.12 If the displacement of a particle at a point is given by $s = 3t^2 - 12t + 14$, then the displacement of the particle when its velocity becomes zero is

Ans

✗ 1. 14 units

✗ 2. 4 units

✗ 3. 0 units

✓ 4. 2 units

Question Type : **MCQ**
Question ID : **37135116372**
Option 1 ID : **37135165486**
Option 2 ID : **37135165488**
Option 3 ID : **37135165485**
Option 4 ID : **37135165487**
Status : **Answered**
Chosen Option : **3**

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Q.13 The joint equation of a pair of lines passing through (2, 3) and parallel to the lines $x^2 - y^2 = 0$ is

Ans

1. $x^2 - y^2 - 4x + 6y - 5 = 0$

2. $x^2 - y^2 - 4x + 6y = 0$

3. $x^2 - y^2 - 4x + 6y + 17 = 0$

4. $x^2 - y^2 - 4x + 6y + 2 = 0$

Question Type : **MCQ**
Question ID : **37135116390**
Option 1 ID : **37135165557**
Option 2 ID : **37135165559**
Option 3 ID : **37135165558**
Option 4 ID : **37135165560**
Status : **Answered**
Chosen Option : **1**

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Q.14

If $y = e^{sin\,(cosec^{-1}x)}$, then $\frac{dy}{dx} =$

Ans

1. $\frac{e^{\frac{1}{x}}}{x^2}$

2. $-\frac{e^{\frac{1}{x}}}{x^2}$

3. 0

4. $e^{cos\,(cosec^{-1}x)}$

Question Type : **MCQ**
Question ID : **37135116378**
Option 1 ID : **37135165510**
Option 2 ID : **37135165511**
Option 3 ID : **37135165512**
Option 4 ID : **37135165509**
Status : **Answered**
Chosen Option : **2**

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Q.15 The approximate value of $log_{10}99$ is (Given log_{10} e = 0.4343)

Ans

✗ 1. 1.9657

✗ 2. 1.9857

✓ 3. 1.9957

✗ 4. 1.9757

Question Type : **MCQ**
Question ID : **37135116375**
Option 1 ID : **37135165497**
Option 2 ID : **37135165499**
Option 3 ID : **37135165500**
Option 4 ID : **37135165498**
Status : **Answered**
Chosen Option : **1**

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Q.16

If the function $f(x) = \dfrac{log10 + log(0.1+2x)}{2x}$ if $x \neq 0$

$= k$ if $x = 0$

is continuous at $x = 0$, then $k + 2 =$

Ans

1. 2

2. 10

3. 12

4. 11

Question Type : **MCQ**
Question ID : **37135116396**
Option 1 ID : **37135165582**
Option 2 ID : **37135165583**
Option 3 ID : **37135165584**
Option 4 ID : **37135165581**
Status : **Answered**
Chosen Option : **3**

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Q.17

$y = mx + \frac{2}{m}$ is the general solution of

Ans

1. $y\left(\frac{dy}{dx}\right)^2 = x\left(\frac{dy}{dx}\right) + 2$

2. $y = x\frac{dy}{dx} + 2$

3. $y\left(\frac{dy}{dx}\right) = x\left(\frac{dy}{dx}\right)^2 + 2$

4. $y\left(\frac{dy}{dx}\right) = x + 2$

Question Type : **MCQ**
Question ID : **37135116391**
Option 1 ID : **37135165563**
Option 2 ID : **37135165562**
Option 3 ID : **37135165561**
Option 4 ID : **37135165564**
Status : **Answered**
Chosen Option : **3**

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Q.18 In a triangle ABC with usual notations, $\frac{\cos A - \cos C}{a - c} + \frac{\cos B}{b} =$

Ans

1. $\frac{1}{b}$

2. $\frac{2}{b}$

3. $\frac{-1}{b}$

4. $\frac{-2}{b}$

Question Type : **MCQ**
Question ID : **37135116363**
Option 1 ID : **37135165451**
Option 2 ID : **37135165450**
Option 3 ID : **37135165449**
Option 4 ID : **37135165452**
Status : **Answered**
Chosen Option : **4**

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Q.19

The maximum value of $Z = 10x + 25y$ subject to $0 \leq x \leq 3$, $0 \leq y \leq 3$, $x + y \leq 5$, $x \geq o, y \geq o$ is

Ans

1. 110

2. 100

3. 120

4. 95

Question Type : **MCQ**
Question ID : **37135116368**
Option 1 ID : **37135165469**
Option 2 ID : **37135165471**
Option 3 ID : **37135165470**
Option 4 ID : **37135165472**
Status : **Answered**
Chosen Option : **4**

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Q.20 The equation of a line passing through the point of intersection of the lines $x + 2y + 8 = 0$ and $3x - y + 4 = 0$ and having x and y intercept zero is

Ans

1. $4x - 5y = 0$

2. $5x - 4y = 0$

3. $5x + 4y = 0$

4. $4x + 5y = 0$

Question Type : **MCQ**
Question ID : **37135116388**
Option 1 ID : **37135165551**
Option 2 ID : **37135165549**
Option 3 ID : **37135165550**
Option 4 ID : **37135165552**
Status : **Answered**
Chosen Option : **2**

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Q.21

If $A(3, 2, -1)$ and $B(1, 4, 3)$, then equation of the plane which bisects segment AB perpendicularly is

Ans

1. $x + y + 2z + 3 = 0$

2. $x - y + 2z - 3 = 0$

3. $x + y - 2z - 3 = 0$

4. $x - y - 2z + 3 = 0$

Question Type : **MCQ**
Question ID : **37135116384**
Option 1 ID : **37135165533**
Option 2 ID : **37135165535**
Option 3 ID : **37135165536**
Option 4 ID : **37135165534**
Status : **Answered**
Chosen Option : **3**

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Q.22 ABCD is a parallelogram, P is the mid-point of AB. If R is the point of intersection of AC and DP, then R divides AC internally in the ratio

Ans

1. 3:1

2. 2:1

3. 1:2

4. 2:3

Question Type : **MCQ**
Question ID : **37135116393**
Option 1 ID : **37135165572**
Option 2 ID : **37135165571**
Option 3 ID : **37135165569**
Option 4 ID : **37135165570**
Status : **Answered**
Chosen Option : **3**

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Q.23 Two dice are thrown together. The probability that sum of the numbers is divisible by 2 or 3 is

Ans

✗ 1. $\frac{1}{6}$

✗ 2. $\frac{3}{4}$

✗ 3. $\frac{1}{3}$

✓ 4. $\frac{2}{3}$

Question Type : **MCQ**
Question ID : **37135116351**
Option 1 ID : **37135165403**
Option 2 ID : **37135165404**
Option 3 ID : **37135165402**
Option 4 ID : **37135165401**
Status : **Answered**
Chosen Option : **2**

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Q.24

$\frac{1^2}{2}+\frac{1^2+2^2}{3}+\frac{1^2+2^2+3^2}{4}+\frac{1^2+2^2+3^2+4^2}{5}+$ ... ... upto 8 terms =

Ans

1. 76

2. 74

3. 78

4. 72

Question Type : **MCQ**
Question ID : **37135116364**
Option 1 ID : **37135165455**
Option 2 ID : **37135165454**
Option 3 ID : **37135165456**
Option 4 ID : **37135165453**
Status : **Answered**
Chosen Option : **2**

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Q.25

$$\int_0^{\frac{\pi}{2}} \frac{dx}{1+cosx} =$$

Ans

1. -2

2. 2

3. 1

4. -1

Question Type : **MCQ**
Question ID : **37135116366**
Option 1 ID : **37135165463**
Option 2 ID : **37135165462**
Option 3 ID : **37135165464**
Option 4 ID : **37135165461**
Status : **Answered**
Chosen Option : **3**

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Q.26

Which of the following have the same value

(a) $\sin 120°$

(b) $\cos 930°$

(c) $\tan 840°$

(d) $\cot(-1110°)$

Ans

1. only (a) and (b)

2. All (a), (b), (c), (d)

3. only (a) and (c)

4. only (c) and (d)

Question Type : **MCQ**
Question ID : **37135116374**
Option 1 ID : **37135165496**
Option 2 ID : **37135165493**
Option 3 ID : **37135165494**
Option 4 ID : **37135165495**
Status : **Answered**
Chosen Option : **3**

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Q.27

$$\int_{-1}^{1} \left[\sqrt{1+x+x^2} - \sqrt{1-x+x^2}\right] dx =$$

Ans

✗ 1. 2

✗ 2. 5

✗ 3. 1

✓ 4. 0

Question Type : **MCQ**
Question ID : **37135116371**
Option 1 ID : **37135165482**
Option 2 ID : **37135165483**
Option 3 ID : **37135165481**
Option 4 ID : **37135165484**
Status : **Answered**
Chosen Option : **1**

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Q.28

$$\int \left[\frac{1-\log x}{1+(logx)^2}\right]^2 dx = =$$

Ans

1. $\frac{1}{1+(logx)^2}+c$

2. $\frac{x}{1+(logx)^2}+c$

3. $\frac{1}{1+logx}+c$

4. $\frac{x}{1+logx}+c$

Question Type : **MCQ**
Question ID : **37135116389**
Option 1 ID : **37135165556**
Option 2 ID : **37135165554**
Option 3 ID : **37135165555**
Option 4 ID : **37135165553**
Status : **Answered**
Chosen Option : **2**

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Q.29

If $f(x) = e^x g(x)$, $g(0) = 4$, $g'(0) = 2$, then $f'(0) =$

Ans

1. 4

2. 6

3. 1

4. 2

Question Type : **MCQ**
Question ID : **37135116398**
Option 1 ID : **37135165592**
Option 2 ID : **37135165591**
Option 3 ID : **37135165589**
Option 4 ID : **37135165590**
Status : **Answered**
Chosen Option : **2**

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Q.30 The equation of a circle passing through origin and making x-intercept 3 and y-intercept -5 is

Ans

✗ 1. $x^2 + y^2 + 3x + 5y = 0$

✗ 2. $x^2 + y^2 + 3x - 5y = 0$

✓ 3. $x^2 + y^2 - 3x + 5y = 0$

✗ 4. $x^2 + y^2 - 3x - 5y = 0$

Question Type : **MCQ**
Question ID : **37135116359**
Option 1 ID : **37135165434**
Option 2 ID : **37135165436**
Option 3 ID : **37135165433**
Option 4 ID : **37135165435**
Status : **Answered**
Chosen Option : **2**

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Q.31 The co-ordinates of the foot of the perpendicular from the point $(0, 2, 3)$ on the line

$\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$ are

Ans

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

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

3. $(2, 3, 1)$

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

Question Type : **MCQ**
Question ID : **37135116394**
Option 1 ID : **37135165574**
Option 2 ID : **37135165575**
Option 3 ID : **37135165573**
Option 4 ID : **37135165576**
Status : **Answered**
Chosen Option : **2**

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Q.32 The rate of decay of mass of certain substance at time t is proportional to the mass at that instant. The time during which the original mass of m_0 gram will be left to m_1 gram is (k is constant of proportionality)

Ans

✗ 1. $\frac{1}{k} log \left(\frac{m_1}{m_0}\right)$

✗ 2. $k\ log \left(\frac{m_0}{m_1}\right)$

✗ 3. $k\ log \left(\frac{m_1}{m_0}\right)$

✓ 4. $\frac{1}{k} log \left(\frac{m_0}{m_1}\right)$

Question Type : **MCQ**
Question ID : **37135116370**
Option 1 ID : **37135165480**
Option 2 ID : **37135165477**
Option 3 ID : **37135165478**
Option 4 ID : **37135165479**
Status : **Answered**
Chosen Option : **4**

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Q.33

If the error involved in making a certain measurement is continuous random variable X with probability density function $f(x) = k\,(4 - x^2)$ if $-2 \le x \le 2$

$= 0$, otherwise

then , $P[-1 < X < 1] =$

Ans

✗ 1. $\frac{13}{16}$

✗ 2. $\frac{1}{2}$

✗ 3. $\frac{1}{3}$

✓ 4. $\frac{11}{16}$

Question Type : **MCQ**
Question ID : **37135116352**
Option 1 ID : **37135165406**
Option 2 ID : **37135165407**
Option 3 ID : **37135165408**
Option 4 ID : **37135165405**
Status : **Answered**
Chosen Option : **1**

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Q.34

The equation of line passing through the points $(3, 4, -7)$ and $(6, -1, 1)$ is

Ans

1. $\frac{x-3}{3} = \frac{y-4}{-5} = \frac{z+7}{8}$

2. $\frac{x-3}{3} = \frac{y-4}{5} = \frac{z+7}{8}$

3. $\frac{x-3}{-3} = \frac{y-4}{-5} = \frac{z+7}{8}$

4. $\frac{x-3}{3} = \frac{y-4}{-5} = \frac{z-7}{8}$

Question Type : **MCQ**
Question ID : **37135116400**
Option 1 ID : **37135165599**
Option 2 ID : **37135165597**
Option 3 ID : **37135165600**
Option 4 ID : **37135165598**
Status : **Answered**
Chosen Option : **1**

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Q.35 If $[\bar{a}\ \bar{b}\ \bar{c}] = 3$, then the volume of the parallelopiped with $2\bar{a}+\bar{b}$, $2\bar{b}+\bar{c}$, $2\bar{c}+\bar{a}$ as coterminus edges is

Ans

1. 22 cubic units

2. 15 cubic units

3. 27 cubic units

4. 25 cubic units

Question Type : **MCQ**
Question ID : **37135116387**
Option 1 ID : **37135165546**
Option 2 ID : **37135165545**
Option 3 ID : **37135165548**
Option 4 ID : **37135165547**
Status : **Answered**
Chosen Option : **4**

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Q.36

If $f(x) = \frac{3x+4}{5x-7}$, $x \neq \frac{7}{5}$

$g(x) = \frac{7x+4}{5x-3}$, $x \neq \frac{3}{5}$ then

$(g \circ f)(3) =$

Ans

✗ 1. -3

✗ 2. $-\frac{1}{3}$

✓ 3. 3

✗ 4. $\frac{1}{3}$

Question Type : **MCQ**
Question ID : **37135116397**
Option 1 ID : **37135165585**
Option 2 ID : **37135165588**
Option 3 ID : **37135165586**
Option 4 ID : **37135165587**
Status : **Answered**
Chosen Option : **3**

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Q.37

If $\frac{x}{x-y} = log\left(\frac{a}{x-y}\right)$, then $\frac{dy}{dx} =$

Ans

1. $2 + \frac{1}{y}$

2. $\frac{2y-x}{y}$

3. $\frac{2x-y}{x}$

4. $\frac{x-2y}{y}$

Question Type : **MCQ**
Question ID : **37135116365**
Option 1 ID : **37135165457**
Option 2 ID : **37135165459**
Option 3 ID : **37135165458**
Option 4 ID : **37135165460**
Status : **Answered**
Chosen Option : **4**

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Q.38 If one of the lines given by $kx^2 + xy - y^2 = 0$ bisects the angle between the co-ordinate axes, then values of k are

Ans

1. $1, 2$

2. $1, 3$

3. $0, 2$

4. $-2, 2$

Question Type : **MCQ**
Question ID : **37135116361**
Option 1 ID : **37135165442**
Option 2 ID : **37135165444**
Option 3 ID : **37135165441**
Option 4 ID : **37135165443**
Status : **Answered**
Chosen Option : **1**

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Q.39 The particular solution of the differential equation $\left(y + x.\frac{dy}{dx}\right).sinxy = cosx$

at $x = 0$ is

Ans

1. $sinx + cosxy = 1$

2. $cosx - sinxy = 1$

3. $sinx - cosxy = 1$

4. $cosx + sinxy = 1$

Question Type : **MCQ**
Question ID : **37135116377**
Option 1 ID : **37135165507**
Option 2 ID : **37135165506**
Option 3 ID : **37135165508**
Option 4 ID : **37135165505**
Status : **Answered**
Chosen Option : **3**

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Q.40 If $A(0, 4, 0)$, $B(0, 0, 3)$ and $C(0, 4, 3)$ are the vertices of ΔABC, then its incentre is

Ans

1. $(2, 0, 3)$

2. $(3, 0, 2)$

3. $(0, 3, 2)$

4. $(0, 2, 3)$

Question Type : **MCQ**
Question ID : **37135116383**
Option 1 ID : **37135165532**
Option 2 ID : **37135165530**
Option 3 ID : **37135165531**
Option 4 ID : **37135165529**
Status : **Answered**
Chosen Option : **4**

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Q.41 If the angle between the lines whose direction ratios are $4, -3, 5$ and $3, 4, k$ is $\frac{\pi}{3}$, then $k=$

Ans

1. ± 7

2. ± 10

3. ± 5

4. ± 6

Question Type : **MCQ**
Question ID : **37135116399**
Option 1 ID : **37135165595**
Option 2 ID : **37135165596**
Option 3 ID : **37135165593**
Option 4 ID : **37135165594**
Status : **Answered**
Chosen Option : **3**

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Q.42 If the symbolic form of the switching circuit is $[\sim p \vee (p \wedge \sim q)] \vee q$, then the current flows through the circuit only if

Ans

1. irrespective of status of the switches

2. one switch should be open and other should be closed

3. both switches should be closed

4. both switches should be open

Question Type : **MCQ**
Question ID : **37135116360**
Option 1 ID : **37135165440**
Option 2 ID : **37135165439**
Option 3 ID : **37135165437**
Option 4 ID : **37135165438**
Status : **Answered**
Chosen Option : **2**

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Q.43 The probability distribution of a discrete r. v. X is

$X = x$	0	1	2	3	4
$P(X = x)$	k	$2k$	4k	$2k$	k

then value of $P(X \leq 2)$ is

Ans

1. $\frac{1}{10}$

2. $\frac{7}{10}$

3. $\frac{3}{10}$

4. $\frac{9}{10}$

Question Type : **MCQ**
Question ID : **37135116355**
Option 1 ID : **37135165418**
Option 2 ID : **37135165417**
Option 3 ID : **37135165419**
Option 4 ID : **37135165420**
Status : **Answered**
Chosen Option : **2**

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Q.44

If $X \sim B(4, p)$ and $2P(X = 3) = 3P(X = 2)$ then value of p is

Ans

1. $\frac{9}{13}$

2. $\frac{4}{13}$

3. $\frac{1}{13}$

4. $\frac{12}{13}$

Question Type : **MCQ**
Question ID : **37135116362**
Option 1 ID : **37135165446**
Option 2 ID : **37135165445**
Option 3 ID : **37135165447**
Option 4 ID : **37135165448**
Status : **Answered**
Chosen Option : **2**

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Q.45 If $tan\theta + sin\theta = a$ and $tan\theta - sin\theta = b$, then the values of $cot\theta$ and $cosec\theta$ are respectively

Ans

1. $\frac{1}{a+b}, \frac{1}{a-b}$

2. $\frac{2}{a+b}, \frac{2}{a-b}$

3. $\frac{2}{a-b}, \frac{2}{a+b}$

4. $\frac{1}{a-b}, \frac{1}{a+b}$

Question Type : **MCQ**
Question ID : **37135116379**
Option 1 ID : **37135165516**
Option 2 ID : **37135165513**
Option 3 ID : **37135165514**
Option 4 ID : **37135165515**
Status : **Answered**
Chosen Option : **2**

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Q.46 If $P(\theta)$ lies on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and S and S' are foci of the hyperbola, then $SP.S'P=$

Ans

1. $a^2tan^2\theta - b^2sec^2\theta$

2. $a^2tan^2\theta + b^2sec^2\theta$

3. $a^2sec^2\theta + b^2tan^2\theta$

4. $a^2sec^2\theta - b^2tan^2\theta$

Question Type : **MCQ**
Question ID : **37135116356**
Option 1 ID : **37135165423**
Option 2 ID : **37135165421**
Option 3 ID : **37135165422**
Option 4 ID : **37135165424**
Status : **Answered**
Chosen Option : **4**

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Q.47

$$\frac{cos12°-sin12°}{cos12°+sin12°}+\frac{sin147°}{cos147°}=$$

Ans

1. -2

2. 0

3. -1

4. 1

Question Type : **MCQ**
Question ID : **37135116367**
Option 1 ID : **37135165468**
Option 2 ID : **37135165465**
Option 3 ID : **37135165467**
Option 4 ID : **37135165466**
Status : **Answered**
Chosen Option : **2**

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Q.48

In ΔABC, if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ with usual notations, then the triangle is

Ans

✗ 1. an isosceles triangle

✓ 2. an equilateral triangle

✗ 3. a right angled scalene triangle

✗ 4. a scalene triangle

Question Type :	**MCQ**
Question ID :	**37135116376**
Option 1 ID :	**37135165501**
Option 2 ID :	**37135165502**
Option 3 ID :	**37135165504**
Option 4 ID :	**37135165503**
Status :	**Answered**
Chosen Option :	**2**

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Q.49

Solution of the differential equation $\frac{dy}{dx} + 2y = e^{-x}$ is

Ans

1. $y\,e^{x} = x + c$

2. $y\,e^{2x} = x + c$

3. $y\,e^{x} = e^{2x} + c$

4. $y\,e^{2x} = e^{x} + c$

Question Type : **MCQ**
Question ID : **37135116380**
Option 1 ID : **37135165520**
Option 2 ID : **37135165519**
Option 3 ID : **37135165517**
Option 4 ID : **37135165518**
Status : **Answered**
Chosen Option : **4**

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Q.50

The function $f(x) = logx - \frac{2x}{x+2}$ is increasing for all

Ans

1. $x \in (-\infty, 1)$

2. $x \in (-1, \infty)$

3. $x \in (-\infty, 0)$

4. $x \in (0, \infty)$

Question Type : **MCQ**
Question ID : **37135116382**
Option 1 ID : **37135165528**
Option 2 ID : **37135165527**
Option 3 ID : **37135165525**
Option 4 ID : **37135165526**
Status : **Answered**
Chosen Option : **2**

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