Section : Physics

**Q.1** A mass 'm' is tied to one end of a spring and whirled in a horizontal circle with constant angular velocity. The elongation in the spring is 1 cm. If the angular speed is doubled, the elongation in the spring is 6 cm. The original length of the spring is

**Ans**

✗ 1. 3 cm

✓ 2. 9 cm

✗ 3. 6 cm

✗ 4. 12 cm

Question Type : **MCQ**
Question ID : **37135115809**
Option 1 ID : **37135163233**
Option 2 ID : **37135163235**
Option 3 ID : **37135163234**
Option 4 ID : **37135163236**
Status : **Answered**
Chosen Option : **2**

Q.2

A donor impurity results in

Ans

✗ 1.

conduction band just above the filled valence band.

✗ 2.

holes as majority carriers and electrons as minority carriers.

✓ 3.

production of n-type semiconductor.

✗ 4.

production of p-type semiconductor.

Question Type : **MCQ**
Question ID : **37135115832**
Option 1 ID : **37135163325**
Option 2 ID : **37135163328**
Option 3 ID : **37135163326**
Option 4 ID : **37135163327**
Status : **Answered**
Chosen Option : **3**

Q.3 A particle performs S.H.M. with amplitude 'A'. Its speed is tripled at the instant when it is at a distance of $\frac{2A}{3}$ from the mean position. The new amplitude of the motion is

Ans

1. $\frac{5A}{3}$

2. $\frac{7A}{3}$

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

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

Question Type : **MCQ**
Question ID : **37135115816**
Option 1 ID : **37135163263**
Option 2 ID : **37135163264**
Option 3 ID : **37135163262**
Option 4 ID : **37135163261**
Status : **Answered**
Chosen Option : **1**

Q.4 A Fraunhofer diffraction pattern due to a single slit of width 0·3 mm is obtained on a screen placed at a distance of 3m from the slit. The first minima lie at 5·5 mm on either side of the central maximum on the screen. The wavelength of light used is

Ans

1. 6000 Å
2. 5500 Å
3. 4500 Å
4. 5000 Å

Question Type : **MCQ**
Question ID : **37135115804**
Option 1 ID : **37135163216**
Option 2 ID : **37135163215**
Option 3 ID : **37135163213**
Option 4 ID : **37135163214**
Status : **Answered**
Chosen Option : **2**

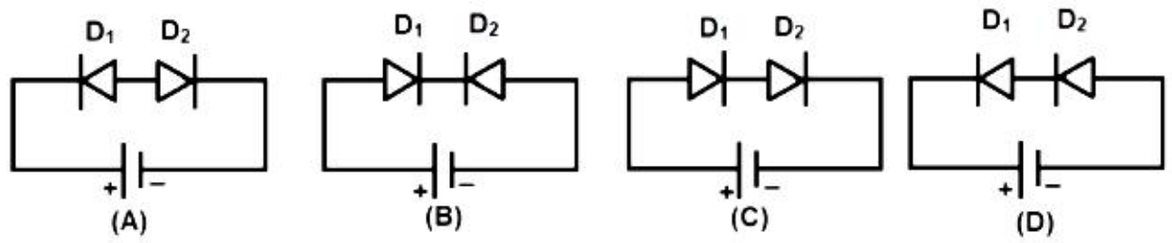
Q.5 One end of thick horizontal copper wire of length '2L' and radius '2R' is welded to an end of another thin horizontal copper wire of length 'L' and radius 'R'. When they are stretched by applying same force at two ends, the ratio of the elongation in the thick wire to that in thin wire is

Ans

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

Question Type : **MCQ**
Question ID : **37135115821**
Option 1 ID : **37135163282**
Option 2 ID : **37135163284**
Option 3 ID : **37135163281**
Option 4 ID : **37135163283**
Status : **Answered**
Chosen Option : **1**

Q.6 The non-zero potential difference across diode $D_1$ and that across diode $D_2$ are equal in the circuit shown in the figure (both the diodes are identical in characteristics)




Ans

✗ 1. (A)

✗ 2. (B)

✗ 3. (D)

✓ 4. (C)

Question Type : **MCQ**
Question ID : **37135115806**
Option 1 ID : **37135163221**
Option 2 ID : **37135163222**
Option 3 ID : **37135163224**
Option 4 ID : **37135163223**
Status : **Answered**
Chosen Option : **4**

Q.7 If $\vec{A} = 3\hat{i} - 2\hat{j} + \hat{k}$, $\vec{B} = \hat{i} - 3\hat{j} + 5\hat{k}$ and $\vec{C} = 2\hat{i} + \hat{j} - 4\hat{k}$ form a right angled triangle then out of the following which one is satisfied?

Ans

✗ 1. $\vec{B} = \vec{A} + \vec{C}, B^2 = A^2 + C^2$

✗ 2. $\vec{A} = \vec{B} + \vec{C}, B^2 = A^2 - C^2$

✗ 3. $\vec{C} = \vec{A} + \vec{B}, C^2 = A^2 + B^2$

✓ 4. $\vec{A} = \vec{B} + \vec{C}, B^2 = A^2 + C^2$

Question Type : **MCQ**
Question ID : **37135115813**
Option 1 ID : **37135163249**
Option 2 ID : **37135163251**
Option 3 ID : **37135163250**
Option 4 ID : **37135163252**
Status : **Answered**
Chosen Option : **1**

Q.8 Two springs of spring constants 'K' and '2K' are stretched by same force. If '$w_1$' and '$w_2$' are the energies stored in them respectively then

Ans

✓ 1. $w_1 = 2w_2$

✗ 2. $w_1 = \frac{w_2}{4}$

✗ 3. $w_2 = 2w_1$

✗ 4. $w_1 = w_2$

Question Type : **MCQ**
Question ID : **37135115811**
Option 1 ID : **37135163241**
Option 2 ID : **37135163244**
Option 3 ID : **37135163242**
Option 4 ID : **37135163243**
Status : **Answered**
Chosen Option : **1**

Q.9 A glass slab of thickness 4 cm contains the same number of waves as in 'x' cm of water column when both are transversed by the same monochromatic light. If the refractive indices of glass and water for that light are $\frac{5}{3}$ and $\frac{4}{3}$ respectively, the value of x will be

Ans

1. $\frac{9}{20}$ cm

2. $\frac{5}{4}$ cm

3. 5 cm

4. $\frac{20}{9}$ cm

Question Type : **MCQ**
Question ID : **37135115850**
Option 1 ID : **37135163398**
Option 2 ID : **37135163399**
Option 3 ID : **37135163400**
Option 4 ID : **37135163397**
Status : **Answered**
Chosen Option : **3**

**Q.10** A toroidal solenoid with air core has an average radius 'R', number of turns 'N' and area of cross-section 'A'. The self-inductance of the solenoid is (Neglect the field variation across the cross-section of the toroid)

**Ans**

✗ 1. $\frac{\mu_0 N^2 A}{R}$

✓ 2. $\frac{\mu_0 N^2 A}{2\pi R}$

✗ 3. $\frac{\mu_0 NA}{2\pi R}$

✗ 4. $\frac{\mu_0 NA}{R}$

Question Type : **MCQ**
Question ID : **37135115812**
Option 1 ID : **37135163248**
Option 2 ID : **37135163247**
Option 3 ID : **37135163246**
Option 4 ID : **37135163245**
Status : **Answered**
Chosen Option : **2**

**Q.11** The length of a potentiometer wire is 'L'. A cell of e.m.f. 'E' is balanced at a length '$\frac{L}{5}$' from the positive end of the wire. If the length of the wire is increased by '$\frac{L}{2}$', at what distance will the same cell give a balance point? '

**Ans**

✗ 1. $\frac{5L}{12}$

✗ 2. $\frac{2L}{15}$

✗ 3. $\frac{4L}{15}$

✓ 4. $\frac{3L}{10}$

Question Type : **MCQ**
Question ID : **37135115810**
Option 1 ID : **37135163240**
Option 2 ID : **37135163238**
Option 3 ID : **37135163239**
Option 4 ID : **37135163237**
Status : **Answered**
Chosen Option : **4**

Q.12 $\vec{A}$ and $\vec{B}$ are two non-zero vectors inclined at an angle 'θ'. $\hat{a}$ and $\hat{b}$ are unit vectors along $\vec{A}$ and $\vec{B}$ respectively. The component of $\vec{A}$ in the direction of $\vec{B}$ is

Ans

✗ 1. $\frac{\vec{A} \cdot \vec{B}}{B}$

✗ 2. $\frac{\vec{A} \times \vec{B}}{A}$

✗ 3. $\hat{a} \cdot \vec{B}$

✓ 4. $\vec{A} \cdot \hat{b}$

Question Type : **MCQ**
Question ID : **37135115823**
Option 1 ID : **37135163289**
Option 2 ID : **37135163290**
Option 3 ID : **37135163291**
Option 4 ID : **37135163292**
Status : **Answered**
Chosen Option : **4**

**Q.13**

An electron accelerated through potential difference 'V' passes through a uniform transverse magnetic field and experiences a force 'F'. If the accelerating potential is increased to '2V', the electron in the same magnetic field will experience a force

**Ans**

✗ 1. $3\ F$

✗ 2. $F$

✓ 3. $\sqrt{2}\ F$

✗ 4. $\frac{F}{2}$

Question Type : **MCQ**
Question ID : **37135115845**
Option 1 ID : **37135163380**
Option 2 ID : **37135163378**
Option 3 ID : **37135163379**
Option 4 ID : **37135163377**
Status : **Answered**
Chosen Option : **3**

**Q.14**

Binding energy of a revolving satellite at height h is $3{\cdot}5 \times 10^8$ J. Its potential energy is

**Ans**

✗ 1. $7{\cdot}0 \times 10^8$ J

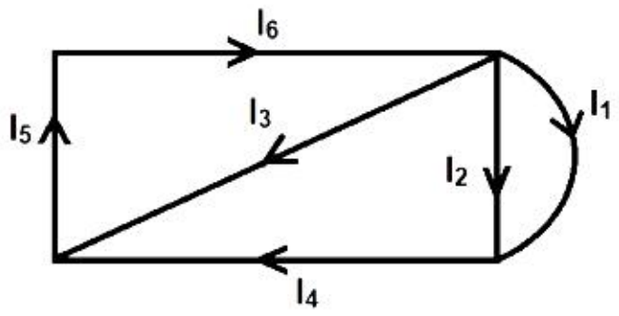
✓ 2. $-7{\cdot}0 \times 10^8$ J

✗ 3. $-3{\cdot}5 \times 10^8$ J

✗ 4. $3{\cdot}5 \times 10^8$ J

Question Type : **MCQ**
Question ID : **37135115807**
Option 1 ID : **37135163228**
Option 2 ID : **37135163227**
Option 3 ID : **37135163225**
Option 4 ID : **37135163226**
Status : **Answered**
Chosen Option : **2**

**Q.15** In the following network, $I_1 = -0{\cdot}4A$, $I_4 = 1A$ and $I_5 = 0{\cdot}4A$. The values of $I_2$, $I_3$ and $I_6$ respectively are




**Ans**

✗ 1. $0{\cdot}4\ A, -0\cdot 6A, 1\cdot 4A$

✗ 2. $-0\cdot 6\ A, 1{\cdot}4A, 0\cdot 4A$

✗ 3. $1{\cdot}4\ A, 0\cdot 4A, -0\cdot 6A$

✓ 4. $1{\cdot}4\ A, -0\cdot 6A, 0\cdot 4A$

Question Type : **MCQ**
Question ID : **37135115827**
Option 1 ID : **37135163305**
Option 2 ID : **37135163306**
Option 3 ID : **37135163308**
Option 4 ID : **37135163307**
Status : **Answered**
Chosen Option : **4**

Q.16 When an electron in a hydrogen atom jumps from the third orbit to the second orbit, it emits a photon of wavelength 'λ'. When it jumps from the fourth orbit to third orbit, the wavelength emitted by the photon will be

Ans

✗ 1. $\frac{20}{13}\lambda$

✗ 2. $\frac{16}{25}\lambda$

✗ 3. $\frac{9}{16}\lambda$

✓ 4. $\frac{20}{7}\lambda$

Question Type : **MCQ**
Question ID : **37135115815**
Option 1 ID : **37135163259**
Option 2 ID : **37135163258**
Option 3 ID : **37135163257**
Option 4 ID : **37135163260**
Status : **Answered**
Chosen Option : **4**

**Q.17** In Young's double slit experiment, the $6^{th}$ maximum with wavelength '$\lambda_1$' is at a distance '$d_1$' from the central maximum and the $4^{th}$ maximum with wavelength $\lambda_2$ is at distance $d_2$. Then $\frac{d_1}{d_2}$ is

**Ans**

✗ 1. $\frac{2}{3}\frac{\lambda_1}{\lambda_2}$

✓ 2. $\frac{3}{2}\frac{\lambda_1}{\lambda_2}$

✗ 3. $\frac{2}{3}\frac{\lambda_2}{\lambda_1}$

✗ 4. $\frac{3}{2}\frac{\lambda_2}{\lambda_1}$

Question Type : **MCQ**
Question ID : **37135115835**
Option 1 ID : **37135163340**
Option 2 ID : **37135163339**
Option 3 ID : **37135163338**
Option 4 ID : **37135163337**
Status : **Answered**
Chosen Option : **1**

**Q.18** If 'E', 'M', 'L' and 'G' denote energy, mass, angular momentum and constant of gravitaion respectively then $\left(\frac{EL^2}{G^2M^5}\right)$ has dimensions of

**Ans**

✔ 1. angle

✗ 2. acceleration

✗ 3. velocity

✗ 4. time

Question Type : **MCQ**
Question ID : **37135115803**
Option 1 ID : **37135163212**
Option 2 ID : **37135163211**
Option 3 ID : **37135163210**
Option 4 ID : **37135163209**
Status : **Answered**
Chosen Option : **3**

**Q.19** A circular coil of radius 'R' carries an electric current 'I'. The magnetic field due to the coil at a point on the axis of the coil located at a distance 'r' from the centre of the coil, such that r ⋙ R, the magnetic field at that point is proportional to

**Ans**

✔ 1. $\frac{1}{r^3}$

✘ 2. $\frac{1}{r}$

✘ 3. $\frac{1}{r^4}$

✘ 4. $\frac{1}{r^2}$

Question Type : **MCQ**
Question ID : **37135115818**
Option 1 ID : **37135163270**
Option 2 ID : **37135163272**
Option 3 ID : **37135163269**
Option 4 ID : **37135163271**
Status : **Answered**
Chosen Option : **1**

Q.20 A body of mass 'M' moving with velocity 'V' explodes into two equal parts. If one part comes to rest and the other part moves with velocity '$v_0$', what would be the value of '$v_0$' ?

Ans

1. ✗ $V$

2. ✗ $\frac{V}{\sqrt{2}}$

3. ✓ $2V$

4. ✗ $4V$

Question Type : **MCQ**
Question ID : **37135115833**
Option 1 ID : **37135163330**
Option 2 ID : **37135163329**
Option 3 ID : **37135163331**
Option 4 ID : **37135163332**
Status : **Answered**
Chosen Option : **1**

Q.21 At what temperature is the R.M.S. velocity of Hydrogen molecule equal to that of an oxygen molecule at 47°C ?
(Molecular weight of hydrogen = 2, Molecular weight of oxygen = 32)

Ans

1. ✗ 80 K

2. ✓ 20 K

3. ✗ 40 K

4. ✗ 60 K

Question Type : **MCQ**
Question ID : **37135115846**
Option 1 ID : **37135163384**
Option 2 ID : **37135163381**
Option 3 ID : **37135163382**
Option 4 ID : **37135163383**
Status : **Answered**
Chosen Option : **2**

Q.22 Earth revolves round the sun in a circular orbit of radius 'R'. The angular momentum of the revolving earth is directly proportional to

Ans

✗ 1. $R^2$

✗ 2. $R^3$

✗ 3. $R$

✓ 4. $\sqrt{R}$

Question Type : **MCQ**
Question ID : **37135115834**
Option 1 ID : **37135163335**
Option 2 ID : **37135163336**
Option 3 ID : **37135163334**
Option 4 ID : **37135163333**
Status : **Answered**
Chosen Option : **3**

Q.23 If 'N' is the number of turns in a circular coil, the value of its self inductance varies as

Ans

✗ 1. $N^3$

✓ 2. $N^2$

✗ 3. $N^0$

✗ 4. $N^1$

Question Type : **MCQ**
Question ID : **37135115830**
Option 1 ID : **37135163320**
Option 2 ID : **37135163319**
Option 3 ID : **37135163317**
Option 4 ID : **37135163318**
Status : **Answered**
Chosen Option : **4**

Q.24 From a uniform circular thin disc of mass 9M and radius R, a small disc of radius $\frac{R}{3}$ is removed. The centre of the small disc is at a distance $\frac{2R}{3}$ from the centre of original disc. The moment of inertia of the remaining disc about an axis perpendicular to the plane of the disc and passing through the centre of the disc of radius R is

Ans

✔ 1. $4MR^2$

✗ 2. $3MR^2$

✗ 3. $\frac{MR^2}{2}$

✗ 4. $MR^2$

Question Type : **MCQ**
Question ID : **37135115805**
Option 1 ID : **37135163220**
Option 2 ID : **37135163219**
Option 3 ID : **37135163217**
Option 4 ID : **37135163218**
Status : **Answered**
Chosen Option : **2**

Q.25 A biconvex lens ($R_1 = R_2 = 20$ cm) has focal length equal to focal length of concave mirror. The radius of curvature of concave mirror is [R.I. of glass lens = 1·5]

Ans

✔ 1. $-40$ cm

✗ 2. $-20$ cm

✗ 3. 40 cm

✗ 4. 20 cm

Question Type : **MCQ**
Question ID : **37135115848**
Option 1 ID : **37135163391**
Option 2 ID : **37135163390**
Option 3 ID : **37135163392**
Option 4 ID : **37135163389**
Status : **Answered**
Chosen Option : **3**

Q.26 With what velocity an observer should move relative to a stationary source so that a sound of double the frequency of source is heard by an observer?

Ans ✗ 1.

Half the velocity of sound towards the source.

✗ 2.

Same as velocity of sound away from the source.

✗ 3.

Twice the velocity of sound towards the source.

✔ 4.

Same as velocity of sound towards the source.

Question Type : **MCQ**
Question ID : **37135115814**
Option 1 ID : **37135163255**
Option 2 ID : **37135163254**
Option 3 ID : **37135163256**
Option 4 ID : **37135163253**
Status : **Answered**
Chosen Option : **2**

Q.27 Water flows through a horizontal pipe at a speed 'V'. Internal diameter of the pipe is 'd'. If the water is emerging at a speed '$V_1$' then the diameter of the nozzle is

Ans

✗ 1. $\frac{V}{V_1}$

✗ 2. $d\sqrt{\frac{V_1}{V}}$

✓ 3. $d\sqrt{\frac{V}{V_1}}$

✗ 4. $\frac{dV_1}{V}$

Question Type : **MCQ**
Question ID : **37135115838**
Option 1 ID : **37135163350**
Option 2 ID : **37135163351**
Option 3 ID : **37135163352**
Option 4 ID : **37135163349**
Status : **Answered**
Chosen Option : **2**

Q.28 Water rises upto a height 'h' in a capillary tube on the surface of the earth . The value of 'h' increases, if the capillary tube apparatus is kept

Ans

✗ 1. in a lift going upward with acceleration.

✗ 2. on the sun.

✗ 3. on the poles.

✓ 4. in a lift going downward with acceleration (a) where a < g (acceleration due to gravity)

Question Type : **MCQ**
Question ID : **37135115839**
Option 1 ID : **37135163355**
Option 2 ID : **37135163354**
Option 3 ID : **37135163353**
Option 4 ID : **37135163356**
Status : **Answered**
Chosen Option : **4**

Q.29 Magnetization of the sample is

Ans

✓ 1. net magnetic dipole moment per unit volume.

✗ 2. volume of the sample per unit magnetic dipole moment.

✗ 3. ratio of magnetic dipole moment and pole strength.

✗ 4. ratio of pole strength to magnetic dipole moment.

Question Type : **MCQ**
Question ID : **37135115802**
Option 1 ID : **37135163206**
Option 2 ID : **37135163205**
Option 3 ID : **37135163207**
Option 4 ID : **37135163208**
Status : **Answered**
Chosen Option : **1**

**Q.30** A signal of frequency 3 kHz is amplitude modulated on a carrier wave of frequency 2·5 MHz. The upper and lower sideband frequencies in the resultant signal are

**Ans**

✗ 1. 2500 kHz, 2503 kHz

✓ 2. 2503 kHz, 2497 kHz

✗ 3. 2·5 MHz, 3 kHz

✗ 4. 5·5 MHz, 0·5 MHz

Question Type : **MCQ**
Question ID : **37135115847**
Option 1 ID : **37135163387**
Option 2 ID : **37135163388**
Option 3 ID : **37135163385**
Option 4 ID : **37135163386**
Status : **Answered**
Chosen Option : **4**

**Q.31** In melde's experiment, when the tension decreases by 0·009 kg-wt, the number of loops changes from 4 to 5. The initial tension is

**Ans**

✗ 1. 0·036 kg-wt.

✗ 2. 0·009 kg-wt.

✗ 3. 0·018 kg-wt.

✓ 4. 0·025 kg-wt.

Question Type : **MCQ**
Question ID : **37135115826**
Option 1 ID : **37135163304**
Option 2 ID : **37135163301**
Option 3 ID : **37135163302**
Option 4 ID : **37135163303**
Status : **Answered**
Chosen Option : **4**

Q.32

Inside a bar magnet, the magnetic lines of force

Ans

✔ 1.

are from S-pole to N-pole of the magnet.

✗ 2. do not exist

✗ 3.

depend upon area of cross-section of bar magnet.

✗ 4.

are from N-pole to S-pole of the magnet.

Question Type : **MCQ**
Question ID : **37135115808**
Option 1 ID : **37135163229**
Option 2 ID : **37135163231**
Option 3 ID : **37135163232**
Option 4 ID : **37135163230**
Status : **Answered**
Chosen Option : **1**

**Q.33** Two identical progressive waves moving in opposite direction superimpose to produce a stationary wave. The wavelength of each progressive wave is 'λ'. The wavelength of the stationary wave is

**Ans**

✗ 1. $\frac{\lambda}{4}$

✗ 2. $\frac{\lambda}{2}$

✓ 3. $\lambda$

✗ 4. $2\lambda$

Question Type : **MCQ**
Question ID : **37135115849**
Option 1 ID : **37135163393**
Option 2 ID : **37135163394**
Option 3 ID : **37135163395**
Option 4 ID : **37135163396**
Status : **Answered**
Chosen Option : **3**

**Q.34** Threshold frequency for a metal is $15 \times 10^{14}$ Hz. The light of wavelength 6000Å falls on the metal surface. Which one of the following statements is correct? [velocity of light, $c = 3 \times 10^8$ m/s]

**Ans**

✗ 1.

photoelectrons are emitted with velocity c.

✗ 2.

photoelectrons come out with velocity $3 \times 10^6$ m/s

✗ 3.

photoelectrons come out with zero velocity.

✓ 4.

photoelectrons will not be emitted.

Question Type : **MCQ**
Question ID : **37135115820**
Option 1 ID : **37135163278**
Option 2 ID : **37135163280**
Option 3 ID : **37135163277**
Option 4 ID : **37135163279**
Status : **Answered**
Chosen Option : **4**

Q.35 In a system of two particles of masses '$m_1$' and '$m_2$', the second particle is moved by a distance 'd' towards the centre of mass. To keep the centre of mass unchanged, the first particle will have to be moved by a distance

Ans

✗ 1.

$\frac{m_1}{m_2}$ d, towards the centre of mass.

✗ 2.

$\frac{m_2}{m_1}$ d, away from the the centre of mass.

✓ 3.

$\frac{m_2}{m_1}$ d, towards the centre of mass.

✗ 4.

$\frac{m_1}{m_2}$ d, away from the centre of mass.

Question Type : **MCQ**
Question ID : **37135115828**
Option 1 ID : **37135163311**
Option 2 ID : **37135163310**
Option 3 ID : **37135163309**
Option 4 ID : **37135163312**
Status : **Answered**
Chosen Option : **2**

Q.36 Water rises to a height of 15 mm in a capillary tube having cross-sectional area 'A'.

If cross-sectional area of the tube is made $\frac{'A'}{3}$ then the water will rise to a height of

Ans

✔ 1. $15\sqrt{3} \times 10^{-3}$ m

✘ 2. $20\sqrt{3} \times 10^{-3}$ m

✘ 3. $5\sqrt{3} \times 10^{-3}$ m

✘ 4. $10\sqrt{3} \times 10^{-3}$ m

Question Type : **MCQ**
Question ID : **37135115829**
Option 1 ID : **37135163314**
Option 2 ID : **37135163316**
Option 3 ID : **37135163313**
Option 4 ID : **37135163315**
Status : **Answered**
Chosen Option : **1**

Q.37 A mass M attached to a horizontal spring executes S.H.M. of amplitude $A_1$. When the mass M passes through its mean position, then a smaller mass m is placed over it and both of them move together with amplitude $A_2$. The ratio of $\left(\frac{A_1}{A_2}\right)$ is

Ans

✗ 1. $\frac{M+m}{M}$

✗ 2. $\left(\frac{M}{M+m}\right)\frac{1}{2}$

✓ 3. $\left(\frac{M+m}{M}\right)\frac{1}{2}$

✗ 4. $\frac{M}{M+m}$

Question Type : **MCQ**
Question ID : **37135115844**
Option 1 ID : **37135163374**
Option 2 ID : **37135163375**
Option 3 ID : **37135163376**
Option 4 ID : **37135163373**
Status : **Answered**
Chosen Option : **2**

Q.38 The dimensions of Planck's constant are same as the product of

Ans

✗ 1. time and displacement.

✗ 2. force and time.

✓ 3. force, displacement and time.

✗ 4. force and displacement.

Question Type : **MCQ**
Question ID : **37135115842**
Option 1 ID : **37135163368**
Option 2 ID : **37135163365**
Option 3 ID : **37135163366**
Option 4 ID : **37135163367**
Status : **Answered**
Chosen Option : **3**

Q.39 A metal rod of cross-sectional area $3 \times 10^{-6}$ $m^2$ is suspended vertically from one end has a length 0·4 m at 100°C. Now the rod is cooled upto 0°C, but prevented from contracting by attaching a mass 'm' at the lower end. The value of 'm' is ($Y = 10^{11}$ $N/m^2$, coefficient of linear expansion $= 10^{-5}$ / K, $g = 10$ $m/s^2$)

Ans

✗ 1. 40 kg

✗ 2. 20 kg

✓ 3. 30 kg

✗ 4. 10 kg

Question Type : **MCQ**
Question ID : **37135115836**
Option 1 ID : **37135163344**
Option 2 ID : **37135163342**
Option 3 ID : **37135163343**
Option 4 ID : **37135163341**
Status : **Answered**
Chosen Option : **3**

**Q.40** A closed organ pipe and an open organ pipe have their first overtones identical in frequency. Their lengths are in the ratio

**Ans**

✔ 1. $3:4$

✗ 2. $2:3$

✗ 3. $4:5$

✗ 4. $1:2$

Question Type : **MCQ**
Question ID : **37135115819**
Option 1 ID : **37135163275**
Option 2 ID : **37135163274**
Option 3 ID : **37135163276**
Option 4 ID : **37135163273**
Status : **Answered**
Chosen Option : **1**

**Q.41** Three condensers of capacities $C_1$, $C_2$, $C_3$ are connected in series with a source of e.m.f. V. The potentials across the three condensers are in the ratio of

**Ans**

✗ 1. $C_1 : C_2 : C_3$

✗ 2. $C_1^2 : C_2^2 : C_3^2$

✗ 3. $1:1:1$

✔ 4. $\frac{1}{C_1} : \frac{1}{C_2} : \frac{1}{C_3}$

Question Type : **MCQ**
Question ID : **37135115817**
Option 1 ID : **37135163266**
Option 2 ID : **37135163267**
Option 3 ID : **37135163265**
Option 4 ID : **37135163268**
Status : **Answered**
Chosen Option : **4**

Q.42 Four capacitors of equal capacity have an equivalent capacitance $C_1$ when connected in series and an equivalent capacitance $C_2$ when connected in parallel.

The ratio $\frac{C_2}{C_1}$, is

Ans

1. 4 ✗
2. 12 ✗
3. 16 ✓
4. 8 ✗

Question Type : **MCQ**
Question ID : **37135115840**
Option 1 ID : **37135163357**
Option 2 ID : **37135163359**
Option 3 ID : **37135163360**
Option 4 ID : **37135163358**
Status : **Answered**
Chosen Option : **3**

Q.43 A ring and a disc have same mass and same radius. The ratio of moment of inertia of a ring about a tangent in its plane to that of the disc about its diameter is

Ans

1. 6 : 1 ✓
2. 4 : 1 ✗
3. 2 : 1 ✗
4. 8 : 1 ✗

Question Type : **MCQ**
Question ID : **37135115801**
Option 1 ID : **37135163203**
Option 2 ID : **37135163202**
Option 3 ID : **37135163201**
Option 4 ID : **37135163204**
Status : **Answered**
Chosen Option : **1**

**Q.44** A bar magnet of magnetic moment 5 $Am^2$ is placed in a uniform magnetic induction $3 \times 10^{-5}$ T. If each pole of a magnet experiences a force of $2{\cdot}5 \times 10^{-4}$ N then the magnetic length of the magnet is

**Ans**

✗ 1. 0·8 m

✗ 2. 0·2 m

✓ 3. 0·6 m

✗ 4. 0·4 m

Question Type : **MCQ**
Question ID : **37135115837**
Option 1 ID : **37135163348**
Option 2 ID : **37135163345**
Option 3 ID : **37135163347**
Option 4 ID : **37135163346**
Status : **Answered**
Chosen Option : **3**

**Q.45** If the kinetic energy of a particle is increased to 16 times its previous value, the percentage change in the de-Broglie wavelength of the particle is

**Ans**

✓ 1. 75

✗ 2. 25

✗ 3. 50

✗ 4. 5

Question Type : **MCQ**
Question ID : **37135115825**
Option 1 ID : **37135163297**
Option 2 ID : **37135163299**
Option 3 ID : **37135163298**
Option 4 ID : **37135163300**
Status : **Answered**
Chosen Option : **1**

**Q.46** A black body has maximum wavelength $\lambda_m$ at temperature 2200 K. Its corresponding wavelength at temperature 3300 K will be

**Ans**

✗ 1. $\frac{9}{4}\lambda_m$.

✗ 2. $\frac{3}{2}\lambda_m$.

✗ 3. $\frac{4}{9}\lambda_m$.

✓ 4. $\frac{2}{3}\lambda_m$.

Question Type : **MCQ**
Question ID : **37135115831**
Option 1 ID : **37135163322**
Option 2 ID : **37135163321**
Option 3 ID : **37135163324**
Option 4 ID : **37135163323**
Status : **Answered**
Chosen Option : **4**

Q.47 A particle performing U.C.M. of radius $\frac{\pi}{2}$ m makes 'x' revolutions in time 't'. Its tangential velocity is

Ans

✗ 1. $\frac{\pi t}{x^2}$

✗ 2. $\frac{\pi x^2}{t}$

✗ 3. $\frac{\pi x}{t^2}$

✓ 4. $\frac{\pi^2 x}{t}$

Question Type : **MCQ**
Question ID : **37135115841**
Option 1 ID : **37135163363**
Option 2 ID : **37135163362**
Option 3 ID : **37135163364**
Option 4 ID : **37135163361**
Status : **Answered**
Chosen Option : **4**

Q.48 Two bodies have their moments of inertia I and 2I respectively about their axes of rotation. If their kinetic energies of rotation are equal, their angular momenta will be in the ratio

Ans

✗ 1. $2 : 1$

✗ 2. $1 : 2\sqrt{2}$

✓ 3. $1 : \sqrt{2}$

✗ 4. $1 : 2$

Question Type : **MCQ**
Question ID : **37135115824**
Option 1 ID : **37135163295**
Option 2 ID : **37135163296**
Option 3 ID : **37135163294**
Option 4 ID : **37135163293**
Status : **Answered**
Chosen Option : **3**

**Q.49** The refractive index of glass is $\frac{3}{2}$ and that of water is $\frac{4}{3}$. The critical angle for a ray of light going from glass to water is

**Ans**

✗ 1. $\sin^{-1}\left(\frac{4}{7}\right)$

✗ 2. $\sin^{-1}\left(\frac{5}{8}\right)$

✗ 3. $\sin^{-1}\left(\frac{2}{3}\right)$

✓ 4. $\sin^{-1}\left(\frac{8}{9}\right)$

Question Type : **MCQ**
Question ID : **37135115843**
Option 1 ID : **37135163370**
Option 2 ID : **37135163371**
Option 3 ID : **37135163369**
Option 4 ID : **37135163372**
Status : **Answered**
Chosen Option : **4**

**Q.50** A galvanometer of resistance 100 Ω requires 10 μA current for full scale deflection. Now a resistance of 1 Ω is connected to convert it into an ammeter. The minimum current required to obtain full scale deflection is

**Ans**

✗ 1. 101 mA

✓ 2. 1·01 mA

✗ 3. 11·0 mA

✗ 4. 10·1 mA

Question Type : **MCQ**
Question ID : **37135115822**
Option 1 ID : **37135163285**
Option 2 ID : **37135163288**
Option 3 ID : **37135163286**
Option 4 ID : **37135163287**
Status : **Answered**
Chosen Option : **2**

Section : Chemistry

Q.1

Identify the product X obtained in following reaction

$$CH_3\text{-}(CH_2)_4\text{-}CH_3 \xrightarrow[773\ K,10\text{-}20\ atm]{Cr_2O_3} X$$

Ans

✗ 1. $CH_3\text{-}CH = CH\text{-}CH_3 + CH_2 = CH_2 + H_2$

✗ 2. $2\ CH_3\text{-}CH = CH_2 + H_2$

✓ 3. $C_6H_6 + 4\ H_2$

✗ 4. $CH_3\text{-}(CH_2)_3\text{-}CH = CH_2 + H_2$

Question Type : **MCQ**
Question ID : **37135115882**
Option 1 ID : **37135163527**
Option 2 ID : **37135163525**
Option 3 ID : **37135163528**
Option 4 ID : **37135163526**
Status : **Answered**
Chosen Option : **1**

Q.2 Which element from following forms colourless compounds in +2 oxidation state ?

Ans

✗ 1. $Co\ (Z = 27)$

✓ 2. $Zn\ (Z = 30)$

✗ 3. $Cu\ (Z = 29)$

✗ 4. $Mn\ (Z = 25)$

Question Type : **MCQ**
Question ID : **37135115863**
Option 1 ID : **37135163450**
Option 2 ID : **37135163452**
Option 3 ID : **37135163449**
Option 4 ID : **37135163451**
Status : **Answered**
Chosen Option : **4**

Q.3

Which of the following compounds is NOT present in it's standard state at 25°C and 1 atmosphere pressure ?

Ans

✗ 1. $CO_{2(g)}$

✗ 2. $CaCO_{3(s)}$

✗ 3. $C_2H_5OH_{(l)}$

✓ 4. $H_2O_{(g)}$

Question Type : **MCQ**
Question ID : **37135115883**
Option 1 ID : **37135163532**
Option 2 ID : **37135163531**
Option 3 ID : **37135163529**
Option 4 ID : **37135163530**
Status : **Answered**
Chosen Option : **4**

Q.4

Which among the following vitamins belongs to aromatic series ?

Ans

✗ 1. Vitamin A

✗ 2. Vitamin C

✗ 3. Vitamin B complex

✓ 4. Vitamin K

Question Type : **MCQ**
Question ID : **37135115876**
Option 1 ID : **37135163502**
Option 2 ID : **37135163503**
Option 3 ID : **37135163504**
Option 4 ID : **37135163501**
Status : **Answered**
Chosen Option : **4**

Q.5 The rate law for the reaction $2NO_{(g)} + O_{2(g)} \longrightarrow 2NO_{2(g)}$ is rate = k $[NO]^2$ $[O_2]$, then which among the following statement is correct ?

Ans

✗ 1.

The reaction is first order in $O_2$, first order in NO and second order overall.

✗ 2.

The reaction is second order in NO, zero order in $O_2$ and second order overall.

✓ 3.

The reaction is second order in NO, first order in $O_2$ and third order overall.

✗ 4.

The reaction is zero order overall.

Question Type : **MCQ**
Question ID : **37135115875**
Option 1 ID : **37135163497**
Option 2 ID : **37135163499**
Option 3 ID : **37135163498**
Option 4 ID : **37135163500**
Status : **Answered**
Chosen Option : **3**

Q.6

If 'Q' is the magnitude of charge and 'r' is the distance between the centres of positive and negative charges then dipole moment ( μ ) is given by

Ans

✗ 1. $\mu = Q + r$

✓ 2. $\mu = Q \times r$

✗ 3. $\mu = \frac{Q}{r}$

✗ 4. $\mu = Q - r$

Question Type : **MCQ**
Question ID : **37135115855**
Option 1 ID : **37135163419**
Option 2 ID : **37135163418**
Option 3 ID : **37135163417**
Option 4 ID : **37135163420**
Status : **Answered**
Chosen Option : **2**

Q.7

Which of the following properties of hydrogen is similar to halogen family ?

Ans

✔ 1. Ionisation enthalpy

✗ 2. Formation of unipositive ion

✗ 3. Electronic configuration

✗ 4. Electron gain enthalpy

Question Type : **MCQ**
Question ID : **37135115889**
Option 1 ID : **37135163554**
Option 2 ID : **37135163556**
Option 3 ID : **37135163553**
Option 4 ID : **37135163555**
Status : **Answered**
Chosen Option : **2**

Q.8 How many methyl groups are present in n-hexadecyl trimethyl ammonium chloride ?

Ans

✗ 1. 3

✗ 2. 4

✓ 3. 14

✗ 4. 6

Question Type : **MCQ**
Question ID : **37135115870**
Option 1 ID : **37135163477**
Option 2 ID : **37135163478**
Option 3 ID : **37135163480**
Option 4 ID : **37135163479**
Status : **Answered**
Chosen Option : **3**

Q.9

Which among the following is a correct formula of Pentammine aqua cobalt (III) iodide ?

Ans

✔ 1. $[Co(NH_3)_5(H_2O)]I_3$

✗ 2. $[Co(H_2O)(NH_3)_5I]$

✗ 3. $[Co(NH_3)_5I]H_2O$

✗ 4. $[Co(H_2O)(NH_3)_5]I$

Question Type : **MCQ**
Question ID : **37135115857**
Option 1 ID : **37135163427**
Option 2 ID : **37135163426**
Option 3 ID : **37135163425**
Option 4 ID : **37135163428**
Status : **Answered**
Chosen Option : **1**

Q.10

The IUPAC name of $CH_3$-$CH_2$-O-$CH_2$-$CH(CH_3)_2$ is

Ans

✗ 1. 3-Ethoxy-2-methylpropane

✗ 2. 1-Ethoxy butane

✓ 3. 1-Ethoxy-2-methylpropane

✗ 4. 1-Ethoxy isobutane

Question Type : **MCQ**
Question ID : **37135115885**
Option 1 ID : **37135163537**
Option 2 ID : **37135163539**
Option 3 ID : **37135163538**
Option 4 ID : **37135163540**
Status : **Answered**
Chosen Option : **3**

Q.11

Which of the following acids, does NOT undergo Hell-Vohlard-Zelinsky reaction ?

Ans

✗ 1. Butanoic acid

✗ 2. Propanoic acid

✗ 3. Ethanoic acid

✓ 4. Methanoic acid

Question Type : **MCQ**
Question ID : **37135115856**
Option 1 ID : **37135163424**
Option 2 ID : **37135163423**
Option 3 ID : **37135163422**
Option 4 ID : **37135163421**
Status : **Answered**
Chosen Option : **4**

Q.12 Which among the following decreasing order of boiling points is correct for amines ?

Ans ✗ 1.

Ethyl dimethylamine > Diethylamine > n-Butylamine

✗ 2.

Diethylamine > Ethyl dimethylamine > n-Butylamine

✗ 3.

n-Butylamine > Ethyl dimethylamine > Diethylamine

✓ 4.

n-Butylamine > Diethylamine > Ethyl dimethylamine

Question Type : **MCQ**
Question ID : **37135115898**
Option 1 ID : **37135163589**
Option 2 ID : **37135163591**
Option 3 ID : **37135163592**
Option 4 ID : **37135163590**
Status : **Answered**
Chosen Option : **2**

**Q.13**

Which of the following is obtained by hydrogenation of benzoyl chloride in presence of Pd on $BaSO_4$ ?

**Ans**

✗ 1. Benzene

✗ 2. Benzoic acid

✗ 3. Benzyl alcohol

✓ 4. Benzaldehyde

Question Type : **MCQ**
Question ID : **37135115879**
Option 1 ID : **37135163516**
Option 2 ID : **37135163514**
Option 3 ID : **37135163513**
Option 4 ID : **37135163515**
Status : **Answered**
Chosen Option : **4**

Q.14

Which of the following oxyacid of chlorine has highest thermal stability ?

Ans

✔ 1. $HClO_4$

✗ 2. $HClO$

✗ 3. $HClO_3$

✗ 4. $HClO_2$

Question Type : **MCQ**
Question ID : **37135115892**
Option 1 ID : **37135163568**
Option 2 ID : **37135163565**
Option 3 ID : **37135163567**
Option 4 ID : **37135163566**
Status : **Answered**
Chosen Option : **4**

Q.15 Which of the following compounds is obtained by dry distillation of calcium propionate ?

Ans

✔ 1. Pentan-3-one

✗ 2. Pentan-2-one

✗ 3. Propanone

✗ 4. Butan-2-one

Question Type : **MCQ**
Question ID : **37135115861**
Option 1 ID : **37135163444**
Option 2 ID : **37135163443**
Option 3 ID : **37135163441**
Option 4 ID : **37135163442**
Status : **Answered**
Chosen Option : **2**

**Q.16** Which of the following processes for refining of metals involves a principle of selective adsorption of the components from a mixture.

**Ans**

✗ 1. Electrolytic refining

✓ 2. Chromatography

✗ 3. polling

✗ 4. Zone refining

Question Type : **MCQ**
Question ID : **37135115873**
Option 1 ID : **37135163490**
Option 2 ID : **37135163491**
Option 3 ID : **37135163492**
Option 4 ID : **37135163489**
Status : **Answered**
Chosen Option : **4**

Q.17

Which among following processes occurs at 1500 K in blast furnace for extraction of iron ?

Ans

✗ 1. Reduction of ore

✗ 2. Ore loses moisture

✗ 3. Combustion of coke

✓ 4. Slag formation

Question Type : **MCQ**
Question ID : **37135115896**
Option 1 ID : **37135163583**
Option 2 ID : **37135163581**
Option 3 ID : **37135163584**
Option 4 ID : **37135163582**
Status : **Answered**
Chosen Option : **3**

Q.18

Which of the following types of valences, according to Werner's theory is also called as primary valence ?

Ans

✔ 1. Ionisable valence

✗ 2. Auxiliary valence

✗ 3. Residual valence

✗ 4. Subsidiary valence

Question Type : **MCQ**
Question ID : **37135115880**
Option 1 ID : **37135163520**
Option 2 ID : **37135163517**
Option 3 ID : **37135163518**
Option 4 ID : **37135163519**
Status : **Answered**
Chosen Option : **1**

Q.19 During the electrolysis of aqueous sodium chloride the product obtained at anode is

Ans

✗ 1. $H_{2(g)}$

✓ 2. $Cl_{2(g)}$

✗ 3. $Na_{(s)}$

✗ 4. $O_2$

Question Type : **MCQ**
Question ID : **37135115858**
Option 1 ID : **37135163432**
Option 2 ID : **37135163429**
Option 3 ID : **37135163431**
Option 4 ID : **37135163430**
Status : **Answered**
Chosen Option : **2**

Q.20

Which among the following is a linear polymer ?

Ans

✗ 1. Melamine

✗ 2. Vulcanised rubber

✓ 3. Polyvinylchloride

✗ 4. Polypropylene

Question Type : **MCQ**
Question ID : **37135115866**
Option 1 ID : **37135163464**
Option 2 ID : **37135163462**
Option 3 ID : **37135163463**
Option 4 ID : **37135163461**
Status : **Answered**
Chosen Option : **3**

Q.21

For a reaction $\Delta H = -30$ kJ and $\Delta S = -45$ J $K^{-1}$, at what temperature reaction changes from spontaneous to non spontaneous ?

Ans

✗ 1. 777·0 K

✗ 2. 675·0 K

✓ 3. 666·6 K

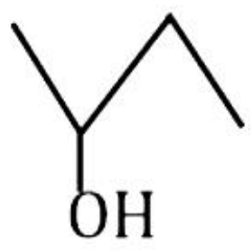
✗ 4. 375·0 K

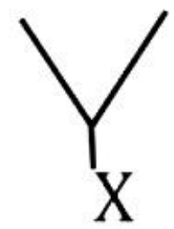
Question Type : **MCQ**
Question ID : **37135115867**
Option 1 ID : **37135163468**
Option 2 ID : **37135163467**
Option 3 ID : **37135163466**
Option 4 ID : **37135163465**
Status : **Answered**
Chosen Option : **3**

**Q.22** Compound A on reaction with chlorine in presence of u.v. light gives B; which when reacted with $NaNO_2$ in the solvent N, N-dimethyl formamide, gives 2-Nitrobutane. The compound A is

**Ans**

✔ 1. 

✘ 2. 


✘ 3. 


✘ 4. 


Question Type : **MCQ**
Question ID : **37135115890**
Option 1 ID : **37135163559**
Option 2 ID : **37135163557**
Option 3 ID : **37135163558**
Option 4 ID : **37135163560**
Status : **Answered**
Chosen Option : **1**

**Q.23** Average bond enthalpy of water is 464·5 kJ $mol^{-1}$. If the energy required to break first O-H bond is 502 kJ $mol^{-1}$, how much energy per mol is required to break second O-H bond ?

**Ans**

✗ 1. 929 kJ

✗ 2. 251 kJ

✓ 3. 427 kJ

✗ 4. 678 kJ

Question Type : **MCQ**
Question ID : **37135115862**
Option 1 ID : **37135163448**
Option 2 ID : **37135163445**
Option 3 ID : **37135163446**
Option 4 ID : **37135163447**
Status : **Answered**
Chosen Option : **4**

**Q.24** Which among the following alkali metal chloride crystallises in form of hydrate?

**Ans**

✔ 1. $LiCl$

✗ 2. $KCl$

✗ 3. $CsCl$

✗ 4. $NaCl$

Question Type : **MCQ**
Question ID : **37135115895**
Option 1 ID : **37135163577**
Option 2 ID : **37135163579**
Option 3 ID : **37135163580**
Option 4 ID : **37135163578**
Status : **Answered**
Chosen Option : **1**

Q.25

Which of the following polymers is prepared by using phenol ?

Ans

✔ 1. Bakelite

✘ 2. Melamine

✘ 3. Teflon

✘ 4. Neoprene

Question Type : **MCQ**
Question ID : **37135115872**
Option 1 ID : **37135163485**
Option 2 ID : **37135163487**
Option 3 ID : **37135163486**
Option 4 ID : **37135163488**
Status : **Answered**
Chosen Option : **1**

Q.26

Which of the following compounds does NOT react with sodium metal ?

Ans

✗ 1. $CH_3\text{-}CH_2\text{-}OH$

✗ 2. $C_6H_5OH$

✓ 3. $CH_3\text{-}O\text{-}CH_3$

✗ 4. $CH_3\text{-}COOH$

Question Type : **MCQ**
Question ID : **37135115891**
Option 1 ID : **37135163561**
Option 2 ID : **37135163564**
Option 3 ID : **37135163562**
Option 4 ID : **37135163563**
Status : **Answered**
Chosen Option : **3**

Q.27

Which among the following is a product of hydrolysis of one mole raffinose ?

Ans ✔ 1.

1 mole Glucose + 1 mole Fructose + 1 mole Galactose

✗ 2.

1 mole Fructose + 2 moles Glucose

✗ 3. 2 moles of Glucose

✗ 4.

2 moles Glucose + 1 mole Fructose + 1 mole Galactose

Question Type : **MCQ**
Question ID : **37135115887**
Option 1 ID : **37135163546**
Option 2 ID : **37135163547**
Option 3 ID : **37135163545**
Option 4 ID : **37135163548**
Status : **Answered**
Chosen Option : **1**

Q.28 Which among the following formulae represents the ω - amino caproic acid ?

Ans

1. $H_2N-(CH_2)_5-COOH$

2. $H_2N-CH_2-COOH$

3. $H_2N-CO-CH_2-\underset{\displaystyle COOH}{\overset{\displaystyle NH_2}{\underset{|}{\overset{|}{CH}}}}$

4. $HO\text{-}CH_2CH(NH_2)-COOH$

Question Type : **MCQ**
Question ID : **37135115859**
Option 1 ID : **37135163434**
Option 2 ID : **37135163433**
Option 3 ID : **37135163436**
Option 4 ID : **37135163435**
Status : **Answered**
Chosen Option : **1**

Q.29

Which among the following is NOT a polar molecular solid ?

Ans

✔ 1. $CH_4$

✗ 2. $SO_2$

✗ 3. $HCl$

✗ 4. $H_2S$

Question Type : **MCQ**
Question ID : **37135115888**
Option 1 ID : **37135163551**
Option 2 ID : **37135163550**
Option 3 ID : **37135163549**
Option 4 ID : **37135163552**
Status : **Answered**
Chosen Option : **1**

**Q.30** A certain sample of gas has a volume of 0.2 L at one atmosphere pressure and 273.15 K. What is the volume of gas at 273.15 °C at same pressure ?

**Ans**

✗ 1. 2·703 L

✗ 2. 0·2 L

✓ 3. 0·4 L

✗ 4. 5·406 L

Question Type : **MCQ**
Question ID : **37135115878**
Option 1 ID : **37135163511**
Option 2 ID : **37135163509**
Option 3 ID : **37135163510**
Option 4 ID : **37135163512**
Status : **Answered**
Chosen Option : **4**

Q.31

$3{\cdot}42 \times 10^{-2}$ kg Sugar (molar mass 342) is dissolved in water to produce 234.2 g of sugar syrup, what is the molality of sugar syrup ?

Ans

✔ 1. $0{\cdot}50\ \text{mol kg}^{-1}$

✘ 2. $0{\cdot}76\ \text{mol kg}^{-1}$

✘ 3. $0{\cdot}67\ \text{mol kg}^{-1}$

✘ 4. $0{\cdot}85\ \text{mol kg}^{-1}$

Question Type : **MCQ**
Question ID : **37135115860**
Option 1 ID : **37135163437**
Option 2 ID : **37135163439**
Option 3 ID : **37135163438**
Option 4 ID : **37135163440**
Status : **Answered**
Chosen Option : **1**

Q.32

Which of the following is a Gattermann reaction ?

Ans

✗ 1.

$$Ar\,N_2^+\,X^- \xrightarrow{CuCl/HCl} ArCl + N_2\uparrow$$

✗ 2.

$$Ar\,N_2^+\,X^- \xrightarrow{HBF_4} ArN_2^+\,BF_4^- \longrightarrow ArF + N_2\uparrow + BF_3$$

✓ 3.

$$Ar\,N_2^+\,X^- \xrightarrow{Cu/HBr} ArBr + N_2\uparrow$$

✗ 4.

$$Ar\,N_2^+\,X^- \xrightarrow[\Delta]{KI} ArI + N_2\uparrow + KX$$

Question Type : **MCQ**
Question ID : **37135115893**
Option 1 ID : **37135163569**
Option 2 ID : **37135163572**
Option 3 ID : **37135163570**
Option 4 ID : **37135163571**
Status : **Answered**
Chosen Option : **3**

Q.33 Which among the following oxides of nitrogen is brown coloured gas ?

Ans

✗ 1. $N_2O_5$

✗ 2. $N_2O_3$

✓ 3. $NO_2$

✗ 4. $N_2O_4$

Question Type : **MCQ**
Question ID : **37135115886**
Option 1 ID : **37135163544**
Option 2 ID : **37135163542**
Option 3 ID : **37135163541**
Option 4 ID : **37135163543**
Status : **Answered**
Chosen Option : **2**

Q.34

The units nanometer and picometer are related as,

Ans

✔ 1. $1\ \text{nm} = 10^{3}\text{pm}$

✘ 2. $1\ \text{nm} = 10^{-9}\text{pm}$

✘ 3. $1\ \text{nm} = 10^{-12}\text{pm}$

✘ 4. $1\ \text{nm} = 10^{-3}\text{pm}$

Question Type : **MCQ**
Question ID : **37135115884**
Option 1 ID : **37135163536**
Option 2 ID : **37135163534**
Option 3 ID : **37135163535**
Option 4 ID : **37135163533**
Status : **Answered**
Chosen Option : **4**

Q.35

Which among the following gases is used in treatment of cancer ?

Ans

✗ 1. He

✗ 2. Ar

✗ 3. Ne

✓ 4. Rn

Question Type : **MCQ**
Question ID : **37135115852**
Option 1 ID : **37135163405**
Option 2 ID : **37135163407**
Option 3 ID : **37135163406**
Option 4 ID : **37135163408**
Status : **Answered**
Chosen Option : **2**

Q.36 In a first order reaction 87·5 % of reactant is converted in to product in 15 minutes.
The rate constant for the reaction is given by

Ans

✔ 1. $\frac{0{\cdot}693}{5}\ \text{min}^{-1}$

✗ 2. $\frac{0{\cdot}693}{15}\ \text{min}^{-1}$

✗ 3. $\frac{5}{0{\cdot}693}\ \text{min}^{-1}$

✗ 4. $0{\cdot}693 \times 5\ \text{min}^{-1}$

Question Type : **MCQ**
Question ID : **37135115865**
Option 1 ID : **37135163460**
Option 2 ID : **37135163457**
Option 3 ID : **37135163459**
Option 4 ID : **37135163458**
Status : **Answered**
Chosen Option : **1**

Q.37

Which of the following factors affect molarity of solution ?

Ans

✗ 1. Nature of solute dissolved

✓ 2. Temperature

✗ 3. Mass of solvent

✗ 4. Molar mass of solvent

Question Type : **MCQ**
Question ID : **37135115899**
Option 1 ID : **37135163594**
Option 2 ID : **37135163593**
Option 3 ID : **37135163596**
Option 4 ID : **37135163595**
Status : **Answered**
Chosen Option : **3**

**Q.38**

Number of primary carbon atoms present in 3-Ethyl-2,4-dimethyl heptane is ?

**Ans**

✔ 1. 5

✘ 2. 3

✘ 3. 4

✘ 4. 7

Question Type : **MCQ**
Question ID : **37135115900**
Option 1 ID : **37135163599**
Option 2 ID : **37135163597**
Option 3 ID : **37135163598**
Option 4 ID : **37135163600**
Status : **Answered**
Chosen Option : **1**

**Q.39**

38·4 g of unknown substance (molar mass 384 g $mol^{-1}$) and 116 g of acetone is used to prepare a solution at 313 K. If vapour pressure of pure acetone (molar mass 58 g $mol^{-1}$) is 0·842 atmosphere, what is the vapour pressure of solution ?

**Ans**

✗ 1. 0·650 atm.

✗ 2. 0·880 atm.

✓ 3. 0·7999 atm.

✗ 4. 0·958 atm.

Question Type : **MCQ**
Question ID : **37135115894**
Option 1 ID : **37135163576**
Option 2 ID : **37135163574**
Option 3 ID : **37135163575**
Option 4 ID : **37135163573**
Status : **Answered**
Chosen Option : **1**

**Q.40** The highest peak in energy profile diagram for mechanism of alkaline hydrolysis of tertiary butyl bromide represents

**Ans**

✔ 1. transition state of 1st step

✗ 2. formation of carbocation

✗ 3. transition state of 2nd step

✗ 4. products

Question Type : **MCQ**
Question ID : **37135115851**
Option 1 ID : **37135163402**
Option 2 ID : **37135163401**
Option 3 ID : **37135163403**
Option 4 ID : **37135163404**
Status : **Answered**
Chosen Option : **1**

Q.41

How many number of unit cells are present in 100 g of an element with fcc crystal having density 10 g/cm$^3$ and edge length 100 pm ?

Ans

✗ 1. $3 \times 10^{25}$

✗ 2. $2 \times 10^{25}$

✗ 3. $4 \times 10^{25}$

✓ 4. $1 \times 10^{25}$

Question Type : **MCQ**
Question ID : **37135115864**
Option 1 ID : **37135163455**
Option 2 ID : **37135163454**
Option 3 ID : **37135163456**
Option 4 ID : **37135163453**
Status : **Answered**
Chosen Option : **3**

Q.42

Which of the following is used as disinfectant ?

Ans

✗ 1. Bithional

✗ 2. Novestrol

✓ 3. Sulphur dioxide

✗ 4. Cloroxylenol

Question Type : **MCQ**
Question ID : **37135115854**
Option 1 ID : **37135163415**
Option 2 ID : **37135163416**
Option 3 ID : **37135163413**
Option 4 ID : **37135163414**
Status : **Answered**
Chosen Option : **1**

Q.43

Freundlich's equation for adsorption of gas on solid is represented as

Ans

✗ 1. $\frac{m}{x} = k\,P^{n}$

✗ 2. $\frac{x}{m} = k\,P^{n}$

✗ 3. $\frac{m}{x} = k\,P^{\frac{1}{n}}$

✓ 4. $\frac{x}{m} = k\,P^{\frac{1}{n}}$

Question Type : **MCQ**
Question ID : **37135115868**
Option 1 ID : **37135163472**
Option 2 ID : **37135163471**
Option 3 ID : **37135163470**
Option 4 ID : **37135163469**
Status : **Answered**
Chosen Option : **2**

Q.44

What is the packing efficiency of fcc crystal structure ?

Ans

✔ 1. 74·0 %

✗ 2. 68·04 %

✗ 3. 52·4 %

✗ 4. 47·6 %

Question Type : **MCQ**
Question ID : **37135115877**
Option 1 ID : **37135163507**
Option 2 ID : **37135163508**
Option 3 ID : **37135163505**
Option 4 ID : **37135163506**
Status : **Answered**
Chosen Option : **1**

**Q.45** What is the standard potential of cell
$Ni \mid Ni^{2+}_{(1M)} \parallel Cu^{2+}_{(1M)} \mid Cu$ If $E°Cu = 0{\cdot}337$ V and $E°Ni = -0{\cdot}236$ V

**Ans**

✗ 1. 0·101 V

✗ 2. −0·136 V

✓ 3. 0·573 V

✗ 4. −0·753 V

Question Type : **MCQ**
Question ID : **37135115881**
Option 1 ID : **37135163521**
Option 2 ID : **37135163523**
Option 3 ID : **37135163522**
Option 4 ID : **37135163524**
Status : **Answered**
Chosen Option : **3**

Q.46

Which one of the following compounds is optically active ?

Ans

✔ 1. 2-Chloropentane

✗ 2. 3-Chloropentane

✗ 3. 2-Chloropropane

✗ 4. 2-Chloro-2 methyl butane

Question Type : **MCQ**
Question ID : **37135115869**
Option 1 ID : **37135163475**
Option 2 ID : **37135163476**
Option 3 ID : **37135163473**
Option 4 ID : **37135163474**
Status : **Answered**
Chosen Option : **1**

**Q.47**

The number of possible monohalogen derivatives for the alkyl halide having molecular formula $C_4H_9X$ is

**Ans**

✗ 1. 3

✗ 2. 2

✓ 3. 4

✗ 4. 1

Question Type : **MCQ**
Question ID : **37135115897**
Option 1 ID : **37135163586**
Option 2 ID : **37135163587**
Option 3 ID : **37135163585**
Option 4 ID : **37135163588**
Status : **Answered**
Chosen Option : **1**

Q.48

Identify the formula of compound (B) formed in following reaction.

(i) Lanthanoids (Ln) burnt in oxygen forming compound (A)

(ii) Compound (A) reacts with $CO_2$ in excess to form compound (B)

Ans

✗ 1. $LnO_2$

✗ 2. $Ln_2CO_3$

✗ 3. $Ln_3(CO_3)_2$

✓ 4. $Ln_2(CO_3)_3$

Question Type : **MCQ**
Question ID : **37135115874**
Option 1 ID : **37135163493**
Option 2 ID : **37135163495**
Option 3 ID : **37135163494**
Option 4 ID : **37135163496**
Status : **Answered**
Chosen Option : **4**

**Q.49** Which among the following pair of elements show highest oxidation state +7 in their different compounds ?
(Atomic no. Cr = 24, V = 23, Mn = 25, Cl = 17, S = 16)

**Ans**

✔ 1. Mn , Cl

✘ 2. Cr , Mn

✘ 3. V , Mn

✘ 4. S , Cl

Question Type : **MCQ**
Question ID : **37135115871**
Option 1 ID : **37135163483**
Option 2 ID : **37135163481**
Option 3 ID : **37135163482**
Option 4 ID : **37135163484**
Status : **Answered**
Chosen Option : **1**

Q.50

Which of the following is NOT an intensive property ?

Ans

✗ 1. Surface tension

✗ 2. Density

✗ 3. Refractive index

✓ 4. Heat capacity

Question Type : **MCQ**
Question ID : **37135115853**
Option 1 ID : **37135163412**
Option 2 ID : **37135163410**
Option 3 ID : **37135163409**
Option 4 ID : **37135163411**
Status : **Answered**
Chosen Option : **4**

Section : Mathematics

Q.1

$$\int_{-a}^{a} x^2 \left( \frac{e^{x^3} - e^{-x^3}}{e^{x^3} + e^{-x^3}} \right) dx =$$

Ans

✗ 1. $a^2$

✓ 2. $0$

✗ 3. $a$

✗ 4. $2\int_{0}^{a} x^2 \left( \frac{e^{x^3} - e^{-x^3}}{e^{x^3} + e^{-x^3}} \right) dx$

Question Type : **MCQ**
Question ID : **37135115919**
Option 1 ID : **37135163674**
Option 2 ID : **37135163673**
Option 3 ID : **37135163675**
Option 4 ID : **37135163676**
Status : **Answered**
Chosen Option : **2**

Q.2 The shortest distance between the lines $\bar{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k}$ and

$\bar{r} = (p+1)\hat{i} + (2p-1)\hat{j} + (2p+1)\hat{k}$ is

Ans

✗ 1. $\frac{8}{\sqrt{29}}$ units

✗ 2. $\frac{4}{\sqrt{29}}$ units

✓ 3. $\frac{2}{\sqrt{5}}$ units

✗ 4. $\frac{4}{\sqrt{19}}$ units

Question Type : **MCQ**
Question ID : **37135115939**
Option 1 ID : **37135163754**
Option 2 ID : **37135163755**
Option 3 ID : **37135163756**
Option 4 ID : **37135163753**
Status : **Answered**
Chosen Option : **2**

Q.3

The probability that the person who undergoes certain operation will survive is 0·2.

If 5 patients undergo similar operations, then the probability that exactly four will survive is

Ans

✗ 1. 0·0042

✗ 2. 0·0084

✗ 3. 0·0032

✓ 4. 0·0064

Question Type : **MCQ**
Question ID : **37135115907**
Option 1 ID : **37135163626**
Option 2 ID : **37135163627**
Option 3 ID : **37135163625**
Option 4 ID : **37135163628**
Status : **Answered**
Chosen Option : **4**

Q.4

If f : R⟶R, g : R⟶ R are two functions defined by $f(x) = 2x - 3$, $g(x) = x^3 + 5$

then $(fog)^{-1}(x) =$

Ans

✗ 1. $\left(\frac{2x+3}{2}\right)^{\frac{1}{2}}$

✓ 2. $\left(\frac{x-7}{2}\right)^{\frac{1}{3}}$

✗ 3. $\left(\frac{x-7}{2}\right)^{\frac{1}{2}}$

✗ 4. $\left(\frac{x+7}{2}\right)^{\frac{1}{3}}$

Question Type : **MCQ**
Question ID : **37135115920**
Option 1 ID : **37135163679**
Option 2 ID : **37135163678**
Option 3 ID : **37135163677**
Option 4 ID : **37135163680**
Status : **Answered**
Chosen Option : **4**

Q.5 The equation of the line passing through the point $(2, 3, -4)$ and perpendicular to XOZ plane is

Ans

✗ 1. $x = -2\,;\ y = 3 + \lambda\,;\ z = 4$

✗ 2. $\frac{x-2}{1} = \frac{z+4}{1}\,;\ y = 3$

✗ 3. $x = -2\,;\ y = -3 + \lambda\,;\ z = 4$

✓ 4. $x = 2\,;\ y = 3 + \lambda\,;\ z = -4$

Question Type : **MCQ**
Question ID : **37135115937**
Option 1 ID : **37135163748**
Option 2 ID : **37135163745**
Option 3 ID : **37135163747**
Option 4 ID : **37135163746**
Status : **Answered**
Chosen Option : **2**

Q.6

If the vectors $\overline{a} = \hat{i} - 2\hat{j} + \hat{k}$, $\overline{b} = 2\hat{i} - 5\hat{j} + p\hat{k}$ and $\overline{c} = 5\hat{i} - 9\hat{j} + 4\hat{k}$ are coplanar,

then the value of p is

Ans

1. $-3$

2. $3$

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

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

Question Type : **MCQ**
Question ID : **37135115929**
Option 1 ID : **37135163714**
Option 2 ID : **37135163713**
Option 3 ID : **37135163715**
Option 4 ID : **37135163716**
Status : **Answered**
Chosen Option : **2**

Q.7

In $\Delta ABC$ with usual notations $a = 4$, $b = 3$, $\angle A = 60°$, then $c$ is a root of the equation

Ans

✔ 1. $c^2 - 3c - 7 = 0$

✘ 2. $c^2 - 3c + 7 = 0$

✘ 3. $c^2 + 3c - 7 = 0$

✘ 4. $c^2 + 3c + 7 = 0$

Question Type : **MCQ**
Question ID : **37135115912**
Option 1 ID : **37135163645**
Option 2 ID : **37135163646**
Option 3 ID : **37135163648**
Option 4 ID : **37135163647**
Status : **Answered**
Chosen Option : **1**

Q.8

For a sequence if $S_n = \frac{5^n - 2^n}{2^n}$, then its fourth term is

Ans

1. $\frac{375}{16}$

2. $\frac{375}{8}$

3. $\frac{251}{8}$

4. $\frac{251}{16}$

Question Type : **MCQ**
Question ID : **37135115909**
Option 1 ID : **37135163635**
Option 2 ID : **37135163636**
Option 3 ID : **37135163633**
Option 4 ID : **37135163634**
Status : **Answered**
Chosen Option : **1**

Q.9

If the function $f$ defined by $f(x) = K(x - x^2)$ if $0 < x < 1$

$= 0$ , other wise

is the p.d.f. of a r. v. X , then the value of $P(X < \frac{1}{2})$ is

Ans

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

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

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

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

Question Type : **MCQ**
Question ID : **37135115903**
Option 1 ID : **37135163612**
Option 2 ID : **37135163609**
Option 3 ID : **37135163611**
Option 4 ID : **37135163610**
Status : **Answered**
Chosen Option : **2**

Q.10

If $\tan^{-1}\left(\frac{1-x}{1+x}\right)-\frac{1}{2}\tan^{-1}x=0$, for $x>0$, then $x=$

Ans

✗ 1. $\sqrt{3}$

✗ 2. $\frac{1}{\sqrt{2}}$

✓ 3. $\frac{1}{\sqrt{3}}$

✗ 4. $\frac{1}{3}$

Question Type : **MCQ**
Question ID : **37135115943**
Option 1 ID : **37135163770**
Option 2 ID : **37135163771**
Option 3 ID : **37135163769**
Option 4 ID : **37135163772**
Status : **Answered**
Chosen Option : **2**

Q.11

$$cosx.cos7x - cos5x.cos13x =$$

Ans

✗ 1. $2cos^2 6x.cos12x$

✓ 2. $2sin^2 6x.cos6x$

✗ 3. $2sin6x.sin12x$

✗ 4. $2sin6x.cos12x$

Question Type : **MCQ**
Question ID : **37135115948**
Option 1 ID : **37135163791**
Option 2 ID : **37135163792**
Option 3 ID : **37135163790**
Option 4 ID : **37135163789**
Status : **Answered**
Chosen Option : **3**

Q.12

If f : R $\longrightarrow$R, such that $f(x) = \frac{e^x + e^{-x}}{e^x - e^{-x}}$ , then f is

Ans

✗ 1. a periodic function

✗ 2. an even function

✓ 3. an odd function

✗ 4. a neither even nor odd function

Question Type : **MCQ**
Question ID : **37135115925**
Option 1 ID : **37135163700**
Option 2 ID : **37135163697**
Option 3 ID : **37135163698**
Option 4 ID : **37135163699**
Status : **Answered**
Chosen Option : **3**

Q.13

$$\int_0^{\frac{\pi}{2}} \frac{\sin^{\frac{2}{3}} x}{\sin^{\frac{2}{3}} x + \cos^{\frac{2}{3}} x} dx =$$

Ans

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

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

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

4. $\pi$

Question Type : **MCQ**
Question ID : **37135115917**
Option 1 ID : **37135163665**
Option 2 ID : **37135163666**
Option 3 ID : **37135163667**
Option 4 ID : **37135163668**
Status : **Answered**
Chosen Option : **1**

Q.14

Given below is the probability distribution of discrete r.v. X

| $X = x$ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $P[X = x]$ | k | 0 | 2k | 5k | k | 3k |

Then $P[X \geq 4] =$

Ans

✗ 1. $\frac{1}{4}$

✗ 2. $\frac{1}{3}$

✗ 3. $\frac{1}{2}$

✓ 4. $\frac{3}{4}$

Question Type : **MCQ**
Question ID : **37135115905**
Option 1 ID : **37135163617**
Option 2 ID : **37135163619**
Option 3 ID : **37135163618**
Option 4 ID : **37135163620**
Status : **Answered**
Chosen Option : **4**

Q.15

If $tan\,\theta = \frac{1}{3}$, then $cos2\theta =$

Ans

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

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

3. $\frac{1}{5}$

4. $\frac{4}{5}$

Question Type : **MCQ**
Question ID : **37135115940**
Option 1 ID : **37135163760**
Option 2 ID : **37135163758**
Option 3 ID : **37135163759**
Option 4 ID : **37135163757**
Status : **Answered**
Chosen Option : **4**

Q.16

The dual of the statement pattern $\sim p \wedge (q \vee t)$ is

(where t is a tautology and c is a contradiction)

Ans

✗ 1. $p \vee (q \wedge c)$

✗ 2. $\sim p \vee (q \wedge t)$

✓ 3. $\sim p \vee (q \wedge c)$

✗ 4. $p \vee (q \wedge t)$

Question Type : **MCQ**
Question ID : **37135115946**
Option 1 ID : **37135163782**
Option 2 ID : **37135163783**
Option 3 ID : **37135163781**
Option 4 ID : **37135163784**
Status : **Answered**
Chosen Option : **3**

Q.17

$$\int \frac{secx}{\sqrt{log(secx + tan\,x)}}dx =$$

Ans

✗ 1. $\sqrt{log(secx + tanx)} + c$

✗ 2. $\sqrt{secx + tanx)} + c$

✗ 3. $2\sqrt{secx + tanx} + c$

✓ 4. $2\sqrt{log(secx + tanx)} + c$

Question Type : **MCQ**
Question ID : **37135115926**
Option 1 ID : **37135163702**
Option 2 ID : **37135163704**
Option 3 ID : **37135163703**
Option 4 ID : **37135163701**
Status : **Answered**
Chosen Option : **4**

**Q.18** The L.P.P. to maximize $z = x + y$, subject to $x + y \leq 30$, $x \leq 15$, $y \leq 20$, $x + y \geq 15$, $x, y \geq 0$ has

**Ans**

✗ 1. no solution.

✗ 2. a unique solution.

✓ 3. infinite solutions.

✗ 4. unbounded solutions.

Question Type : **MCQ**
Question ID : **37135115918**
Option 1 ID : **37135163670**
Option 2 ID : **37135163669**
Option 3 ID : **37135163672**
Option 4 ID : **37135163671**
Status : **Answered**
Chosen Option : **3**

Q.19 With usual notations, in $\Delta ABC$, if $b\cos^2\frac{C}{2} + c\cos^2\frac{B}{2} = \frac{3a}{2}$, then

Ans

✔ 1. b, a, c are in A.P.

✗ 2. b, a, c are in G.P.

✗ 3. a, b, c are in G.P.

✗ 4. a, b, c are in A.P.

Question Type : **MCQ**
Question ID : **37135115904**
Option 1 ID : **37135163615**
Option 2 ID : **37135163616**
Option 3 ID : **37135163614**
Option 4 ID : **37135163613**
Status : **Answered**
Chosen Option : **1**

Q.20

If $y = e^{4x}\cos 5x$, then $\frac{d^2y}{dx^2}$ $at\ x = 0$ is

Ans

✔ 1. $-9$

✗ 2. 9

✗ 3. 8

✗ 4. $-8$

Question Type : **MCQ**
Question ID : **37135115944**
Option 1 ID : **37135163774**
Option 2 ID : **37135163773**
Option 3 ID : **37135163775**
Option 4 ID : **37135163776**
Status : **Answered**
Chosen Option : **1**

Q.21

The joint equation of pair of lines passing through point of intersection of lines $2x^2 - xy - 15y^2 - 7x + 32y - 9 = 0$ and parallel to co-ordinate axes is

Ans

✔ 1. $xy - x - 2y + 2 = 0$

✘ 2. $xy + x + 2y - 2 = 0$

✘ 3. $xy + x + 2y + 2 = 0$

✘ 4. $xy - x - 2y - 2 = 0$

Question Type : **MCQ**
Question ID : **37135115906**
Option 1 ID : **37135163621**
Option 2 ID : **37135163623**
Option 3 ID : **37135163622**
Option 4 ID : **37135163624**
Status : **Answered**
Chosen Option : **2**

Q.22 A tangent to the curve $x = at^2$, $y = 2at$ is perpendicular to X axis, then the point of contact is

Ans

✗ 1. $(0, -a)$

✓ 2. $(0, 0)$

✗ 3. $(0,\ 2a)$

✗ 4. $(0,\ a)$

Question Type : **MCQ**
Question ID : **37135115938**
Option 1 ID : **37135163751**
Option 2 ID : **37135163749**
Option 3 ID : **37135163752**
Option 4 ID : **37135163750**
Status : **Answered**
Chosen Option : **1**

**Q.23**

If $P(A') = 0 \cdot 6$, $P(B) = 0 \cdot 8$ and $P(B/A) = 0 \cdot 3$, then $P(A/B) =$

**Ans**

✗ 1. $\frac{7}{20}$

✓ 2. $\frac{3}{20}$

✗ 3. $\frac{3}{4}$

✗ 4. $\frac{9}{20}$

Question Type : **MCQ**
Question ID : **37135115914**
Option 1 ID : **37135163654**
Option 2 ID : **37135163655**
Option 3 ID : **37135163653**
Option 4 ID : **37135163656**
Status : **Answered**
Chosen Option : **2**

Q.24

The co-ordinates of foci of the ellipse $16x^2 + 9y^2 = 144$ are

Ans

✗ 1. $(\pm 7\ , 0)$

✓ 2. $(0, \pm \sqrt{7}\ )$

✗ 3. $(\pm \sqrt{7}\ , 0)$

✗ 4. $(0, \pm 7\ )$

Question Type : **MCQ**
Question ID : **37135115934**
Option 1 ID : **37135163734**
Option 2 ID : **37135163735**
Option 3 ID : **37135163733**
Option 4 ID : **37135163736**
Status : **Answered**
Chosen Option : **2**

**Q.25**

The radius of a circle is increasing at the rate 2 cm/sec. The rate at which its area is increasing when the radius of the circle is 5 decimeters is

**Ans**

✗ 1. $100\ \pi\ cm^2/sec$

✓ 2. $200\ \pi\ cm^2/sec$

✗ 3. $2000\ \pi\ cm^2/sec$

✗ 4. $20\ \pi\ cm^2/sec$

Question Type : **MCQ**
Question ID : **37135115927**
Option 1 ID : **37135163707**
Option 2 ID : **37135163705**
Option 3 ID : **37135163708**
Option 4 ID : **37135163706**
Status : **Answered**
Chosen Option : **3**

Q.26

$$\int_0^1 \tan^{-1}\left[\frac{2x-1}{1+x-x^2}\right]dx =$$

Ans

✔ 1. $0$

✘ 2. $\frac{\pi}{6}$

✘ 3. $1$

✘ 4. $\frac{\pi}{4}$

Question Type : **MCQ**
Question ID : **37135115915**
Option 1 ID : **37135163657**
Option 2 ID : **37135163660**
Option 3 ID : **37135163658**
Option 4 ID : **37135163659**
Status : **Answered**
Chosen Option : **4**

Q.27 In a certain culture of bacteria, the rate of increase is proportional to the number present. It is found that the number doubles in 4 hours. Then the number of times the bacteria are increased in 12 hours is

Ans

✗ 1. 6

✓ 2. 8

✗ 3. 12

✗ 4. 4

Question Type : **MCQ**
Question ID : **37135115942**
Option 1 ID : **37135163766**
Option 2 ID : **37135163767**
Option 3 ID : **37135163768**
Option 4 ID : **37135163765**
Status : **Answered**
Chosen Option : **2**

**Q.28**

If one of the lines given by the equation $x^2 + kxy + 2y^2 = 0$ is $x + 2y = 0$, then k =

**Ans**

✗ 1. 2

✗ 2. 1

✓ 3. 3

✗ 4. 4

Question Type : **MCQ**
Question ID : **37135115931**
Option 1 ID : **37135163722**
Option 2 ID : **37135163721**
Option 3 ID : **37135163723**
Option 4 ID : **37135163724**
Status : **Answered**
Chosen Option : **3**

Q.29 The area bounded by the parabola $x^2 = 4y$ and the lines $y = 2$, $y = 4$ and $Y$ - axis is

Ans

✗ 1. $\frac{4}{3}(8 - 2\sqrt{2})$ sq. units

✓ 2. $\frac{8}{3}(8 - 2\sqrt{2})$ sq. units

✗ 3. $\frac{8}{3}(8 + 2\sqrt{2})$ sq. units

✗ 4. $(8 - 2\sqrt{2})$ sq. units

Question Type : **MCQ**
Question ID : **37135115913**
Option 1 ID : **37135163652**
Option 2 ID : **37135163649**
Option 3 ID : **37135163651**
Option 4 ID : **37135163650**
Status : **Answered**
Chosen Option : **1**

Q.30

$$\int \frac{\sin 2x}{\sin^2 x \cos^2 x} dx =$$

Ans

✔ 1. $log|\tan^2 x| + c$

✗ 2. $log|sec^2 x| + c$

✗ 3. $log|\tan x| + c$

✗ 4. $log|\sec x| + c$

Question Type : **MCQ**
Question ID : **37135115923**
Option 1 ID : **37135163690**
Option 2 ID : **37135163692**
Option 3 ID : **37135163689**
Option 4 ID : **37135163691**
Status : **Answered**
Chosen Option : **1**

**Q.31**

If a, b, c are lengths of the sides BC, CA, AB respectively of ΔABC and H is any point in the plane of ΔABC such that $a\overline{AH} + b\overline{BH} + c\overline{CH} = \overline{0}$, then H is the

**Ans**

✗ 1. Circumcentre of ΔABC

✓ 2. Incentre of ΔABC

✗ 3. Centroid of ΔABC

✗ 4. Orthocentre of ΔABC

Question Type : **MCQ**
Question ID : **37135115924**
Option 1 ID : **37135163694**
Option 2 ID : **37135163696**
Option 3 ID : **37135163693**
Option 4 ID : **37135163695**
Status : **Answered**
Chosen Option : **2**

Q.32

Which of the following statement pattern is a tautology ?

$S_1 \equiv (\sim q \wedge p) \wedge q$

$S_2 \equiv [p \wedge ( p \rightarrow q )] \rightarrow q$

$S_3 \equiv (p \wedge q) \wedge (\sim p \vee \sim q )$

$S_4 \equiv (p \wedge q) \rightarrow r$

Ans

1. $S_4$

2. $S_3$

3. $S_1$

4. $S_2$

Question Type : **MCQ**
Question ID : **37135115935**
Option 1 ID : **37135163740**
Option 2 ID : **37135163739**
Option 3 ID : **37135163737**
Option 4 ID : **37135163738**
Status : **Answered**
Chosen Option : **1**

**Q.33** If $\overline{AB} = 3\hat{i} + 5\hat{j} + 4\hat{k}$, $\overline{AC} = 5\hat{i} - 5\hat{j} + 2\hat{k}$ represent the sides of triangle ABC, then the length of median through A is

**Ans**

✗ 1. $\sqrt{6}$ units

✓ 2. 5 units

✗ 3. $\sqrt{5}$ units

✗ 4. 6 units

Question Type : **MCQ**
Question ID : **37135115910**
Option 1 ID : **37135163640**
Option 2 ID : **37135163638**
Option 3 ID : **37135163637**
Option 4 ID : **37135163639**
Status : **Answered**
Chosen Option : **1**

**Q.34** A plane $E_1$ makes intercepts $1, -3, 4$ on the co-ordinate axes. The equation of a plane parallel to plane $E_1$ and passing through $(2, 6, -8)$ is

**Ans**

✗ 1. $\frac{x}{2} - \frac{y}{3} + \frac{z}{4} + 3 = 0$

✗ 2. $\frac{x}{1} - \frac{y}{3} + \frac{z}{4} + 12 = 0$

✓ 3. $\frac{x}{1} - \frac{y}{3} + \frac{z}{4} + 2 = 0$

✗ 4. $\frac{x}{3} - \frac{y}{6} + \frac{z}{2} + \frac{13}{3} = 0$

Question Type : **MCQ**
Question ID : **37135115941**
Option 1 ID : **37135163763**
Option 2 ID : **37135163764**
Option 3 ID : **37135163762**
Option 4 ID : **37135163761**
Status : **Answered**
Chosen Option : **2**

Q.35

If a line in octant OXYZ makes equal angles with co-ordinate axes, then

Ans

1. $l = m = n = \frac{1}{3}$

2. $l = m = n = -\frac{1}{3}$

3. $l = m = n = \frac{1}{\sqrt{3}}$

4. $l = m = n = -\frac{1}{\sqrt{3}}$

Question Type : **MCQ**
Question ID : **37135115902**
Option 1 ID : **37135163606**
Option 2 ID : **37135163608**
Option 3 ID : **37135163605**
Option 4 ID : **37135163607**
Status : **Answered**
Chosen Option : **3**

**Q.36** The length of latus rectum of the parabola whose focus is at $(1, -2)$ and directrix is the line $x + y + 3 = 0$ is

**Ans**

✗ 1. $8\sqrt{2}$ units

✓ 2. $2\sqrt{2}$ units

✗ 3. $\sqrt{2}$ units

✗ 4. $4\sqrt{2}$ units

Question Type : **MCQ**
Question ID : **37135115932**
Option 1 ID : **37135163728**
Option 2 ID : **37135163726**
Option 3 ID : **37135163725**
Option 4 ID : **37135163727**
Status : **Answered**
Chosen Option : **1**

Q.37

If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$, then $(B^{-1}A^{-1})^{-1} =$

Ans

✗ 1. $\begin{bmatrix} 2 & 3 \\ 1 & -2 \end{bmatrix}$

✗ 2. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

✗ 3. $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

✓ 4. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Question Type : **MCQ**
Question ID : **37135115901**
Option 1 ID : **37135163604**
Option 2 ID : **37135163603**
Option 3 ID : **37135163601**
Option 4 ID : **37135163602**
Status : **Answered**
Chosen Option : **4**

Q.38

If $log_{10}\left(\frac{x^3-y^3}{x^3+y^3}\right) = 2$ then $\frac{dx}{dy} =$

Ans

✗ 1. $\left(-\frac{99}{101}\right)\frac{x^2}{y^2}$

✗ 2. $\left(-\frac{101}{99}\right)\frac{x^2}{y^2}$

✓ 3. $\left(-\frac{101}{99}\right)\frac{y^2}{x^2}$

✗ 4. $\left(-\frac{99}{101}\right)\frac{y^2}{x^2}$

Question Type : **MCQ**
Question ID : **37135115930**
Option 1 ID : **37135163720**
Option 2 ID : **37135163719**
Option 3 ID : **37135163717**
Option 4 ID : **37135163718**
Status : **Answered**
Chosen Option : **1**

Q.39

The integrating factor of the differential equation $\frac{dy}{dx}+\frac{1}{x}y=x^3-3$ is

Ans

✗ 1. $-y$

✗ 2. $y$

✓ 3. $x$

✗ 4. $-x$

Question Type : **MCQ**
Question ID : **37135115908**
Option 1 ID : **37135163631**
Option 2 ID : **37135163630**
Option 3 ID : **37135163632**
Option 4 ID : **37135163629**
Status : **Answered**
Chosen Option : **3**

Q.40

The distance of the point (3, 4, 5) from the point of intersection of the line $\frac{x-3}{1}=\frac{y-4}{2}=\frac{z-5}{2}$ and plane $x+y+z=2$ is

Ans

✓ 1. 6 units

✗ 2. 13 units

✗ 3. 10 units

✗ 4. 7 units

Question Type : **MCQ**
Question ID : **37135115916**
Option 1 ID : **37135163662**
Option 2 ID : **37135163664**
Option 3 ID : **37135163661**
Option 4 ID : **37135163663**
Status : **Answered**
Chosen Option : **1**

Q.41

$$\int \frac{x^2+1}{x^4+x^2+1}dx =$$

Ans

✔ 1. $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{x-\frac{1}{x}}{\sqrt{3}}\right)+c$

✘ 2. $\frac{1}{3}\tan^{-1}\left(\frac{x-\frac{1}{x}}{3}\right)+c$

✘ 3. $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{x+\frac{1}{x}}{\sqrt{3}}\right)+c$

✘ 4. $\frac{1}{3}\tan^{-1}\left(\frac{x+\frac{1}{x}}{3}\right)+c$

Question Type : **MCQ**
Question ID : **37135115921**
Option 1 ID : **37135163682**
Option 2 ID : **37135163681**
Option 3 ID : **37135163684**
Option 4 ID : **37135163683**
Status : **Answered**
Chosen Option : **3**

Q.42

If $x^2 + y^2 = 1$, then $\frac{d^2x}{dy^2} =$

Ans

1. $x^3$

2. $y^3$

3. $-\frac{1}{x^3}$

4. $-y^3$

Question Type : **MCQ**
Question ID : **37135115936**
Option 1 ID : **37135163743**
Option 2 ID : **37135163742**
Option 3 ID : **37135163744**
Option 4 ID : **37135163741**
Status : **Answered**
Chosen Option : **3**

**Q.43** The general solution of the differential equation $sec^2x\ tany\ dx + sec^2y\ tanx\ dy = 0$

is

**Ans**

✔ 1. $tanx\ tany = c$

✗ 2. $secx\ tany = c$

✗ 3. $secx\ secy = c$

✗ 4. $tanx\ secy = c$

Question Type : **MCQ**
Question ID : **37135115911**
Option 1 ID : **37135163641**
Option 2 ID : **37135163642**
Option 3 ID : **37135163644**
Option 4 ID : **37135163643**
Status : **Answered**
Chosen Option : **1**

**Q.44**

If $sec\theta = \frac{13}{12}$, θ lies in 4th quadrant, then $tan\theta \times cosec\theta \times sin\theta \times cos\theta =$

**Ans**

1. $\frac{-5}{13}$

2. $\frac{144}{169}$

3. $\frac{25}{169}$

4. $\frac{5}{13}$

Question Type : **MCQ**
Question ID : **37135115945**
Option 1 ID : **37135163777**
Option 2 ID : **37135163780**
Option 3 ID : **37135163779**
Option 4 ID : **37135163778**
Status : **Answered**
Chosen Option : **1**

Q.45

The acute angle included between the lines $xsin\theta - ycos\theta = 5$ and

$xsin \propto -ycos \propto +11 = 0$ is

Ans

✔ 1. $|\theta - \propto|$

✗ 2. $\frac{\pi}{4}$

✗ 3. $\frac{\pi}{3}$

✗ 4. $\theta + \propto$

Question Type : **MCQ**
Question ID : **37135115928**
Option 1 ID : **37135163711**
Option 2 ID : **37135163709**
Option 3 ID : **37135163712**
Option 4 ID : **37135163710**
Status : **Answered**
Chosen Option : **1**

**Q.46** Water at 100°C cools in 15 minutes to 75°C in a room temperature of 25°C . Then the temperature of water after 30 minutes is

**Ans**

✗ 1. $\left(\frac{400}{9}\right)^{\circ}C$

✗ 2. $\left(\frac{526}{9}\right)^{\circ}C$

✗ 3. $\left(\frac{335}{9}\right)^{\circ}C$

✓ 4. $\left(\frac{175}{3}\right)^{\circ}C$

Question Type : **MCQ**
Question ID : **37135115950**
Option 1 ID : **37135163798**
Option 2 ID : **37135163799**
Option 3 ID : **37135163797**
Option 4 ID : **37135163800**
Status : **Answered**
Chosen Option : **4**

Q.47

If $A = \begin{bmatrix} 1 & 2 & i \\ 1 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$, then $[\text{adj (adj A)}]^{-1} =$

Ans

✗ 1. $A^2$

✗ 2. $2A$

✓ 3. $A^{-1}$

✗ 4. $I$

Question Type : **MCQ**
Question ID : **37135115922**
Option 1 ID : **37135163685**
Option 2 ID : **37135163688**
Option 3 ID : **37135163686**
Option 4 ID : **37135163687**
Status : **Answered**
Chosen Option : **4**

Q.48

The equation of a normal to the curve $x = 4sec\theta$ and $y = 4tan^2\theta$ at $\theta = \frac{\pi}{4}$ is

Ans

✗ 1. $x + y\sqrt{2} = 7\sqrt{2}$

✗ 2. $2\sqrt{2}\,x + y = 8\sqrt{2}$

✗ 3. $\sqrt{2}\,x + y = 7\sqrt{2}$

✓ 4. $x + 2\sqrt{2}y = 12\sqrt{2}$

Question Type : **MCQ**
Question ID : **37135115933**
Option 1 ID : **37135163729**
Option 2 ID : **37135163730**
Option 3 ID : **37135163732**
Option 4 ID : **37135163731**
Status : **Answered**
Chosen Option : **4**

**Q.49**

The equation of the curve which passes through point $(1, 0)$ and has tangent with slope $1+\frac{y}{x}+\left(\frac{y}{x}\right)^2$ is

**Ans**

✗ 1. $\tan^{-1}\left(\frac{x}{y}\right) = log\ |x|$

✗ 2. $\tan^{-1}\left(\frac{x}{y}\right) = log\ |y|$

✗ 3. $\tan^{-1}\left(\frac{y}{x}\right) = log\ |y|$

✓ 4. $\tan^{-1}\left(\frac{y}{x}\right) = log\ |x|$

Question Type : **MCQ**
Question ID : **37135115949**
Option 1 ID : **37135163795**
Option 2 ID : **37135163796**
Option 3 ID : **37135163793**
Option 4 ID : **37135163794**
Status : **Answered**
Chosen Option : **2**

Q.50

If the function $f(x) = \frac{1-\sin 2x+\cos 2x}{1+\sin 2x+\cos 2x}$ if $x \neq \frac{\pi}{2}$

$= k$ if $x = \frac{\pi}{2}$

is continuous at $x = \frac{\pi}{2}$, then k=

Ans

✗ 1. 2

✗ 2. 1

✗ 3. 0

✓ 4. $-1$

Question Type : **MCQ**
Question ID : **37135115947**
Option 1 ID : **37135163785**
Option 2 ID : **37135163788**
Option 3 ID : **37135163786**
Option 4 ID : **37135163787**
Status : **Answered**
Chosen Option : **4**