# JEE March 2021 16th to 18th Mar

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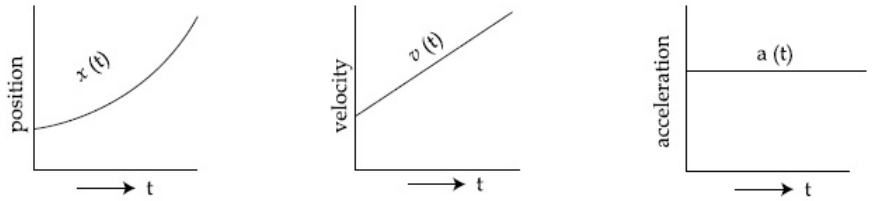
|---|---|
| Application No | |
| Candidate Name | |
| Roll No. | |
| Test Date | 18/03/2021 |
| Test Time | 9:00 AM - 12:00 PM |
| Subject | B TECH |

Section : **Physics Section A**

**Q.1** The position, velocity and acceleration of a particle moving with a constant acceleration can be represented by :

**Options** 1.

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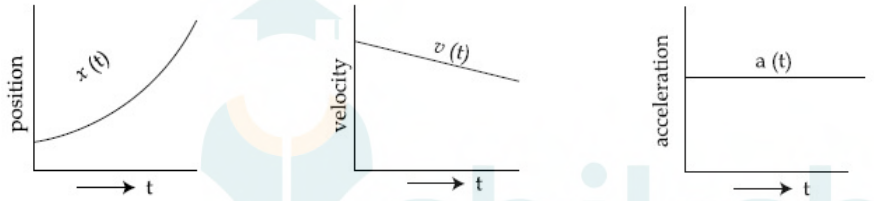


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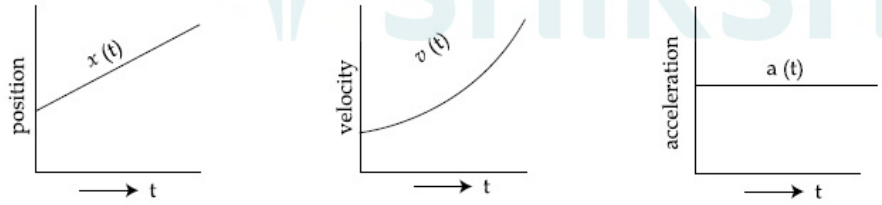


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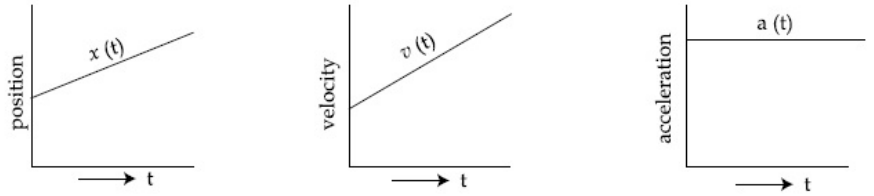



Question Type : **MCQ**
Question ID : **8643514685**
Option 1 ID : **86435114059**
Option 2 ID : **86435114058**
Option 3 ID : **86435114060**
Option 4 ID : **86435114057**
Status : **Answered**
Chosen Option : **1**

**Q.2** A particle is travelling 4 times as fast as an electron. Assuming the ratio of de-Broglie wavelength of a particle to that of electron is 2 : 1, the mass of the particle is :

**Options**

1. 16 times the mass of $e^-$
2. $\frac{1}{16}$ times the mass of $e^-$
3. 8 times the mass of $e^-$
4. $\frac{1}{8}$ times the mass of $e^-$

Question Type : **MCQ**
Question ID : **8643514688**
Option 1 ID : **86435114071**
Option 2 ID : **86435114070**
Option 3 ID : **86435114069**
Option 4 ID : **86435114072**
Status : **Answered**
Chosen Option : **4**

**Q.3** Imagine that the electron in a hydrogen atom is replaced by a muon (μ). The mass of muon particle is 207 times that of an electron and charge is equal to the charge of an electron. The ionization potential of this hydrogen atom will be :

**Options**

1. 331.2 eV
2. 2815.2 eV
3. 13.6 eV
4. 27.2 eV

Question Type : **MCQ**
Question ID : **8643514690**
Option 1 ID : **86435114079**
Option 2 ID : **86435114080**
Option 3 ID : **86435114077**
Option 4 ID : **86435114078**
Status : **Answered**
Chosen Option : **2**

**Q.4** A constant power delivering machine has towed a box, which was initially at rest, along a horizontal straight line. The distance moved by the box in time 't' is proportional to :

**Options**

1. $t^{2/3}$
2. $t^{1/2}$
3. $t^{3/2}$
4. $t$

Question Type : **MCQ**
Question ID : **8643514682**
Option 1 ID : **86435114047**
Option 2 ID : **86435114046**
Option 3 ID : **86435114045**
Option 4 ID : **86435114048**
Status : **Answered**
Chosen Option : **4**

**Q.5** Your friend is having eye sight problem. She is not able to see clearly a distant uniform window mesh and it appears to her as non-uniform and distorted. The doctor diagnosed the problem as :

**Options**

1. Myopia with Astigmatism
2. Astigmatism
3. Myopia and hypermetropia
4. Presbyopia with Astigmatism

Question Type : **MCQ**
Question ID : **8643514696**
Option 1 ID : **86435114104**
Option 2 ID : **86435114103**
Option 3 ID : **86435114101**
Option 4 ID : **86435114102**
Status : **Answered**
Chosen Option : **1**

**Q.6** In Young's double slit arrangement, slits are separated by a gap of 0.5 mm, and the screen is placed at a distance of 0.5 m from them. The distance between the first and the third bright fringe formed when the slits are illuminated by a monochromatic light of 5890 Å is :

**Options**

1. $5890 \times 10^{-7}$ m
2. $1178 \times 10^{-9}$ m
3. $1178 \times 10^{-12}$ m
4. $1178 \times 10^{-6}$ m

Question Type : **MCQ**
Question ID : **8643514687**
Option 1 ID : **86435114066**
Option 2 ID : **86435114067**
Option 3 ID : **86435114065**
Option 4 ID : **86435114068**
Status : **Answered**
Chosen Option : **4**

**Q.7** A loop of flexible wire of irregular shape carrying current is placed in an external magnetic field. Identify the effect of the field on the wire.

**Options**

1. loop assumes circular shape with its plane normal to the field
2. wire gets stretched to become straight
3. loop assumes circular shape with its plane parallel to the field
4. shape of the loop remains unchanged

Question Type : **MCQ**
Question ID : **8643514692**
Option 1 ID : **86435114086**
Option 2 ID : **86435114088**
Option 3 ID : **86435114087**
Option 4 ID : **86435114085**
Status : **Answered**
Chosen Option : **1**

**Q.8** A radioactive sample disintegrates via two independent decay processes having half lives $T_{1/2}^{(1)}$ and $T_{1/2}^{(2)}$ respectively. The effective half-life, $T_{1/2}$ of the nuclei is :

**Options**

1. $T_{1/2} = \dfrac{T_{1/2}^{(1)} T_{1/2}^{(2)}}{T_{1/2}^{(1)} + T_{1/2}^{(2)}}$

2. $T_{1/2} = \dfrac{T_{1/2}^{(1)} + T_{1/2}^{(2)}}{T_{1/2}^{(1)} - T_{1/2}^{(2)}}$

3. $T_{1/2} = T_{1/2}^{(1)} + T_{1/2}^{(2)}$

4. None of the above

Question Type : **MCQ**
Question ID : **8643514691**
Option 1 ID : **86435114081**
Option 2 ID : **86435114083**
Option 3 ID : **86435114082**
Option 4 ID : **86435114084**
Status : **Answered**
Chosen Option : **1**

**Q.9** In a series LCR resonance circuit, if we change the resistance only, from a lower to higher value :

**Options**

1. The quality factor and the resonance frequency will remain constant

2. The resonance frequency will increase

3. The bandwidth of resonance circuit will increase

4. The quality factor will increase

Question Type : **MCQ**
Question ID : **8643514695**
Option 1 ID : **86435114100**
Option 2 ID : **86435114097**
Option 3 ID : **86435114098**
Option 4 ID : **86435114099**
Status : **Not Answered**
Chosen Option : **--**

**Q.10** An AC source rated 220 V, 50 Hz is connected to a resistor. The time taken by the current to change from its maximum to the rms value is :

**Options**

1. 2.5 ms
2. 25 ms
3. 2.5 s
4. 0.25 ms

Question Type : **MCQ**
Question ID : **8643514686**
Option 1 ID : **86435114061**
Option 2 ID : **86435114062**
Option 3 ID : **86435114064**
Option 4 ID : **86435114063**
Status : **Not Answered**
Chosen Option : **--**

**Q.11** Match List - I with List - II.

| List - I | | List - II | |
|---|---|---|---|
| (a) | 10 km height over earth's surface | (i) | Thermosphere |
| (b) | 70 km height over earth's surface | (ii) | Mesosphere |
| (c) | 180 km height over earth's surface | (iii) | Stratosphere |
| (d) | 270 km height over earth's surface | (iv) | Troposphere |

**Options**

1. (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)
2. (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
3. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
4. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Question Type : **MCQ**
Question ID : **8643514698**
Option 1 ID : **86435114112**
Option 2 ID : **86435114110**
Option 3 ID : **86435114109**
Option 4 ID : **86435114111**
Status : **Answered**
Chosen Option : **3**

**Q.12** The time period of a simple pendulum is given by $T = 2\pi\sqrt{\frac{l}{g}}$. The measured value of the length of pendulum is 10 cm known to a 1 mm accuracy. The time for 200 oscillations of the pendulum is found to be 100 second using a clock of 1 s resolution. The percentage accuracy in the determination of 'g' using this pendulum is 'x'. The value of 'x' to the nearest integer is,

**Options**

1. 3%
2. 4%
3. 5%
4. 2%

Question Type : **MCQ**
Question ID : **8643514689**
Option 1 ID : **86435114074**
Option 2 ID : **86435114075**
Option 3 ID : **86435114076**
Option 4 ID : **86435114073**
Status : **Answered**
Chosen Option : **1**

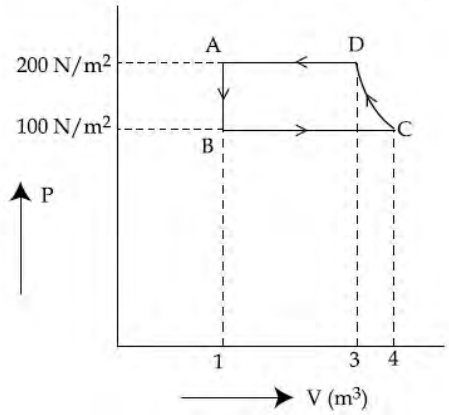
**Q.13** In the experiment of Ohm's law, a potential difference of 5.0 V is applied across the end of a conductor of length 10.0 cm and diameter of 5.00 mm. The measured current in the conductor is 2.00 A. The maximum permissible percentage error in the resistivity of the conductor is :

**Options**

1. 7.5
2. 8.4
3. 3.9
4. 3.0

Question Type : **MCQ**
Question ID : **8643514693**
Option 1 ID : **86435114090**
Option 2 ID : **86435114091**
Option 3 ID : **86435114089**
Option 4 ID : **86435114092**
Status : **Answered**
Chosen Option : **3**

**Q.14** The P-V diagram of a diatomic ideal gas system going under cyclic process as shown in figure. The work done during an adiabatic process CD is (use $\gamma = 1.4$) :




**Options**

1. $400\ J$
2. $-400\ J$
3. $200\ J$
4. $-500\ J$

Question Type : **MCQ**
Question ID : **8643514684**
Option 1 ID : **86435114053**
Option 2 ID : **86435114056**
Option 3 ID : **86435114055**
Option 4 ID : **86435114054**
Status : **Answered**
Chosen Option : **4**

**Q.15** A plane electromagnetic wave of frequency 100 MHz is travelling in vacuum along the $x$-direction. At a particular point in space and time, $\vec{B} = 2.0 \times 10^{-8}\ \hat{k}$ T. (where, $\hat{k}$ is unit vector along $z$-direction) What is $\vec{E}$ at this point ?

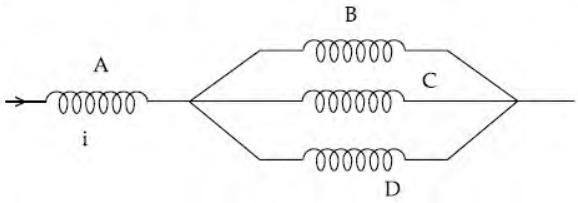
(speed of light $c = 3 \times 10^8$ m/s)

**Options**

1. $6.0\ \hat{j}\ V/m$
2. $0.6\ \hat{k}\ V/m$
3. $6.0\ \hat{k}\ V/m$
4. $0.6\ \hat{j}\ V/m$

Question Type : **MCQ**
Question ID : **8643514699**
Option 1 ID : **86435114114**
Option 2 ID : **86435114116**
Option 3 ID : **86435114115**
Option 4 ID : **86435114113**
Status : **Answered**
Chosen Option : **1**

**Q.16** Four identical long solenoids A, B, C and D are connected to each other as shown in the figure. If the magnetic field at the center of A is 3 T, the field at the center of C would be : (Assume that the magnetic field is confined with in the volume of respective solenoid).




**Options**

1. 6 T
2. 9 T
3. 1 T
4. 12 T

Question Type : **MCQ**
Question ID : **8643514683**
Option 1 ID : **86435114051**
Option 2 ID : **86435114050**
Option 3 ID : **86435114049**
Option 4 ID : **86435114052**
Status : **Answered**
Chosen Option : **3**

**Q.17** What will be the average value of energy along one degree of freedom for an ideal gas in thermal equilibrium at a temperature T ? ($k_B$ is Boltzmann constant)

**Options**

1. $\frac{2}{3} k_B T$
2. $\frac{3}{2} k_B T$
3. $\frac{1}{2} k_B T$
4. $k_B T$

Question Type : **MCQ**
Question ID : **8643514697**
Option 1 ID : **86435114108**
Option 2 ID : **86435114107**
Option 3 ID : **86435114106**
Option 4 ID : **86435114105**
Status : **Answered**
Chosen Option : **3**

**Q.18** A thin circular ring of mass M and radius r is rotating about its axis with an angular speed ω. Two particles having mass m each are now attached at diametrically opposite points. The angular speed of the ring will become :

**Options**

1. $\omega \dfrac{M}{M + 2m}$
2. $\omega \dfrac{M + 2m}{M}$
3. $\omega \dfrac{M - 2m}{M + 2m}$
4. $\omega \dfrac{M}{M + m}$

Question Type : **MCQ**
Question ID : **8643514700**
Option 1 ID : **86435114118**
Option 2 ID : **86435114120**
Option 3 ID : **86435114119**
Option 4 ID : **86435114117**
Status : **Answered**
Chosen Option : **1**

**Q.19** An oil drop of radius 2 mm with a density 3 g $cm^{-3}$ is held stationary under a constant electric field $3.55 \times 10^5$ V $m^{-1}$ in the Millikan's oil drop experiment. What is the number of excess electrons that the oil drop will possess ?
Consider $g = 9.81$ $m/s^2$

**Options**

1. $17.3 \times 10^{10}$
2. $1.73 \times 10^{12}$
3. $1.73 \times 10^{10}$
4. $48.8 \times 10^{11}$

Question Type : **MCQ**
Question ID : **8643514681**
Option 1 ID : **86435114041**
Option 2 ID : **86435114043**
Option 3 ID : **86435114042**
Option 4 ID : **86435114044**
Status : **Answered**
Chosen Option : **3**

**Q.20** The time period of a satellite in a circular orbit of radius R is T. The period of another satellite in a circular orbit of radius 9R is :

**Options**

1. 9 T
2. 27 T
3. 3 T
4. 12 T

Question Type : **MCQ**
Question ID : **8643514694**
Option 1 ID : **86435114094**
Option 2 ID : **86435114095**
Option 3 ID : **86435114093**
Option 4 ID : **86435114096**
Status : **Answered**
Chosen Option : **2**

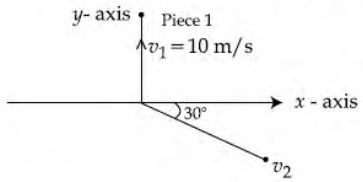
Section : **Physics Section B**

**Q.1** A parallel plate capacitor has plate area 100 $m^2$ and plate separation of 10 m. The space between the plates is filled up to a thickness 5 m with a material of dielectric constant of 10.
The resultant capacitance of the system is '$x$' pF.
The value of $\varepsilon_0 = 8.85 \times 10^{-12}$ $F.m^{-1}$
The value of '$x$' to the nearest integer is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **8643514709**
Status : **Not Answered**

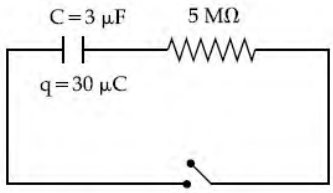
**Q.2** A ball of mass 10 kg moving with a velocity $10\sqrt{3}$ m/s along the $x$-axis, hits another ball of mass 20 kg which is at rest. After the collision, first ball comes to rest while the second ball disintegrates into two equal pieces. One piece starts moving along $y$-axis with a speed of 10 m/s. The second piece starts moving at an angle of 30° with respect to the $x$-axis.
The velocity of the ball moving at 30° with $x$-axis is $x$ m/s.
The configuration of pieces after collision is shown in the figure below.
The value of $x$ to the nearest integer is _____.




Given --
Answer :

Question Type : **SA**
Question ID : **8643514702**
Status : **Not Answered**

**Q.3**




The circuit shown in the figure consists of a charged capacitor of capacity 3 μF and a charge of 30 μC. At time t = 0, when the key is closed, the value of current flowing through the 5 MΩ resistor is '$x$' μA.

The value of '$x$' to the nearest integer is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **8643514706**
Status : **Not Answered**

**Q.4** A person is swimming with a speed of 10 m/s at an angle of 120° with the flow and reaches to a point directly opposite on the other side of the river. The speed of the flow is '$x$' m/s.

The value of '$x$' to the nearest integer is _____.

Given **5**
Answer :

Question Type : **SA**
Question ID : **8643514707**
Status : **Answered**

**Q.5** Two separate wires A and B are stretched by 2 mm and 4 mm respectively, when they are subjected to a force of 2 N. Assume that both the wires are made up of same material and the radius of wire B is 4 times that of the radius of wire A. The length of the wires A and B are in the ratio of a : b. Then $\frac{a}{b}$ can be expressed as $\frac{1}{x}$ where $x$ is _____.

Given **32**
Answer :

Question Type : **SA**
Question ID : **8643514708**
Status : **Answered**

**Q.6** A bullet of mass 0.1 kg is fired on a wooden block to pierce through it, but it stops after moving a distance of 50 cm into it. If the velocity of bullet before hitting the wood is 10 m/s and it slows down with uniform deceleration, then the magnitude of effective retarding force on the bullet is '$x$' N.

The value of '$x$' to the nearest integer is _____.

Given **10**
Answer :

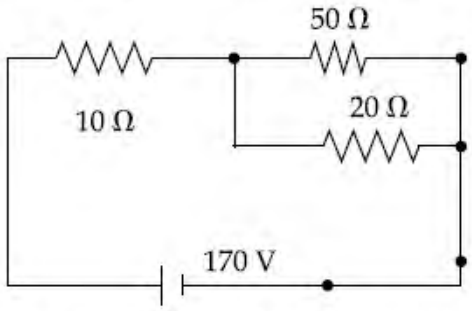
Question Type : **SA**
Question ID : **8643514710**
Status : **Answered**

**Q.7** An npn transistor operates as a common emitter amplifier with a power gain of $10^6$. The input circuit resistance is 100 Ω and the output load resistance is 10 kΩ. The common emitter current gain 'β' will be _____. (Round off to the Nearest Integer)

Given --
Answer :

Question Type : **SA**
Question ID : **8643514701**
Status : **Not Answered**

**Q.8** The voltage across the 10 Ω resistor in the given circuit is $x$ volt.

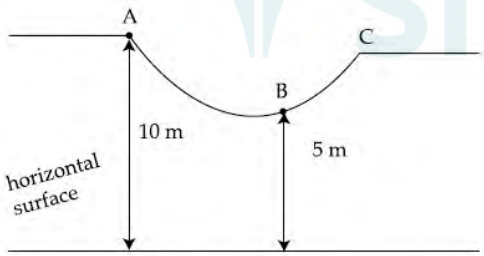



The value of '$x$' to the nearest integer is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **8643514703**
Status : **Not Answered**

**Q.9**




As shown in the figure, a particle of mass 10 kg is placed at a point A. When the particle is slightly displaced to its right, it starts moving and reaches the point B. The speed of the particle at B is $x$ m/s.

(Take $g = 10\ m/s^2$)

The value of '$x$' to the nearest integer is _____.

Given **10**
Answer :

Question Type : **SA**
Question ID : **8643514704**
Status : **Answered**

**Q.10** A particle performs simple harmonic motion with a period of 2 second. The time taken by the particle to cover a displacement equal to half of its amplitude from the mean position is $\frac{1}{a}$ s.

The value of 'a' to the nearest integer is _____.

Given Answer : **6**

Question Type : **SA**
Question ID : **8643514705**
Status : **Answered**

Section : **Chemistry Section A**

**Q.1** A certain orbital has no angular nodes and two radial nodes. The orbital is :

**Options**

1. 3p
2. 2p
3. 3s
4. 2s

Question Type : **MCQ**
Question ID : **8643514712**
Option 1 ID : **86435114138**
Option 2 ID : **86435114136**
Option 3 ID : **86435114137**
Option 4 ID : **86435114135**
Status : **Answered**
Chosen Option : **3**

**Q.2** Match List - I with List - II :

| List - I (Chemicals) | | List - II (Use/Preparation/Constituent) | |
|---|---|---|---|
| (a) | Alcoholic potassium hydroxide | (i) | electrodes in batteries |
| (b) | $Pd/BaSO_4$ | (ii) | obtained by addition reaction |
| (c) | BHC (Benzene hexachloride) | (iii) | used for β-elimination reaction |
| (d) | Polyacetylene | (iv) | Lindlar's Catalyst |

Choose the **most appropriate** match :

**Options**

1. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
2. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
3. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
4. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Question Type : **MCQ**
Question ID : **8643514723**
Option 1 ID : **86435114181**
Option 2 ID : **86435114182**
Option 3 ID : **86435114180**
Option 4 ID : **86435114179**
Status : **Answered**
Chosen Option : **2**

**Q.3** Match List - I with List - II :

| List - I (Process) | | List - II (Catalyst) | |
|---|---|---|---|
| (a) | Deacon's process | (i) | ZSM-5 |
| (b) | Contact process | (ii) | $CuCl_2$ |
| (c) | Cracking of hydrocarbons | (iii) | Particles 'Ni' |
| (d) | Hydrogenation of vegetable oils | (iv) | $V_2O_5$ |

Choose the **most appropriate** answer from the options given below :

**Options**

1. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
2. (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
3. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
4. (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

Question Type : **MCQ**
Question ID : **8643514713**
Option 1 ID : **86435114141**
Option 2 ID : **86435114140**
Option 3 ID : **86435114142**
Option 4 ID : **86435114139**
Status : **Answered**
Chosen Option : **3**

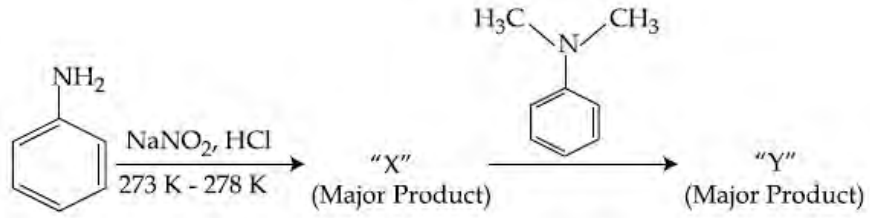
**Q.4** The chemical that is added to reduce the melting point of the reaction mixture during the extraction of aluminium is :

**Options**

1. Kaolite
2. Cryolite
3. Bauxite
4. Calamine

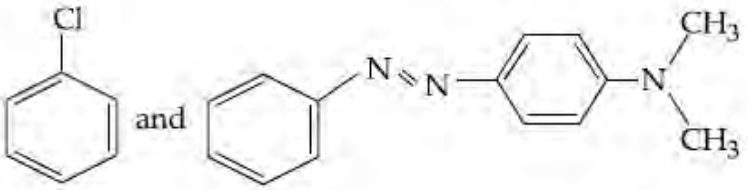
Question Type : **MCQ**
Question ID : **8643514715**
Option 1 ID : **86435114148**
Option 2 ID : **86435114150**
Option 3 ID : **86435114147**
Option 4 ID : **86435114149**
Status : **Not Answered**
Chosen Option : **--**

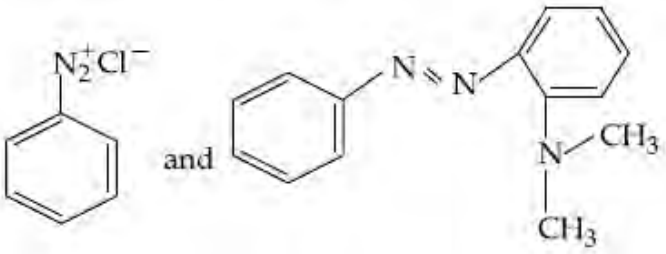
**Q.5**

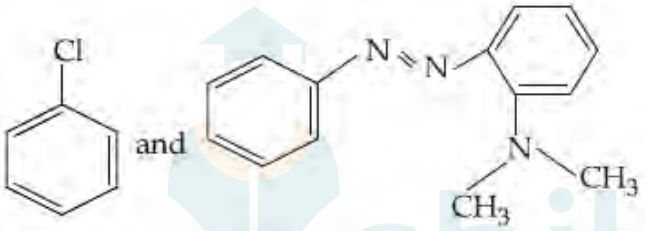


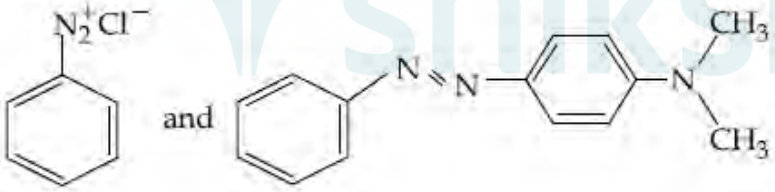

Considering the above reaction, X and Y respectively are :

**Options**

1. 


2. 


3. 


4. 


Question Type : **MCQ**
Question ID : **8643514727**
Option 1 ID : **86435114198**
Option 2 ID : **86435114195**
Option 3 ID : **86435114196**
Option 4 ID : **86435114197**
Status : **Answered**
Chosen Option : **4**

**Q.6** Reagent, 1-naphthylamine and sulphanilic acid in acetic acid is used for the detection of :

**Options**

1. $N_2O$
2. $NO_2^-$
3. $NO_3^-$
4. NO

Question Type : **MCQ**
Question ID : **8643514730**
Option 1 ID : **86435114210**
Option 2 ID : **86435114207**
Option 3 ID : **86435114208**
Option 4 ID : **86435114209**
Status : **Not Answered**
Chosen Option : **--**

**Q.7** Given below are two Statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :

**Assertion A :** During the boiling of water having temporary hardness, $Mg(HCO_3)_2$ is converted to $MgCO_3$.

**Reason R :** The solubility product of $Mg(OH)_2$ is greater than that of $MgCO_3$.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

**Options**

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is false but **R** is true
4. **A** is true but **R** is false

Question Type : **MCQ**
Question ID : **8643514716**
Option 1 ID : **86435114151**
Option 2 ID : **86435114152**
Option 3 ID : **86435114154**
Option 4 ID : **86435114153**
Status : **Answered**
Chosen Option : **2**

**Q.8** The number of ionisable hydrogens present in the product obtained from a reaction of phosphorus trichloride and phosphonic acid is :

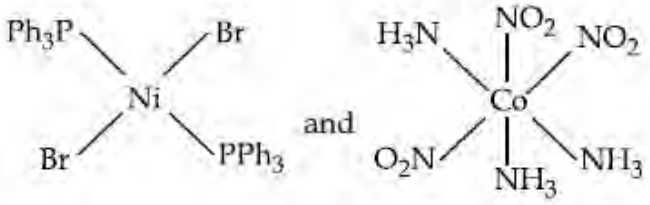
**Options**

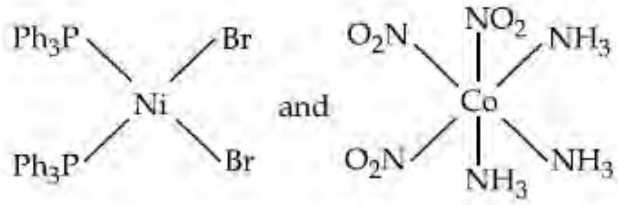
1. 3
2. 1
3. 0
4. 2

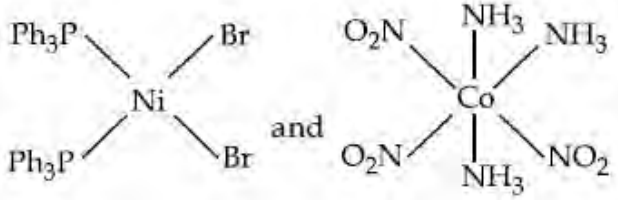
Question Type : **MCQ**
Question ID : **8643514718**
Option 1 ID : **86435114162**
Option 2 ID : **86435114159**
Option 3 ID : **86435114161**
Option 4 ID : **86435114160**
Status : **Answered**
Chosen Option : **1**

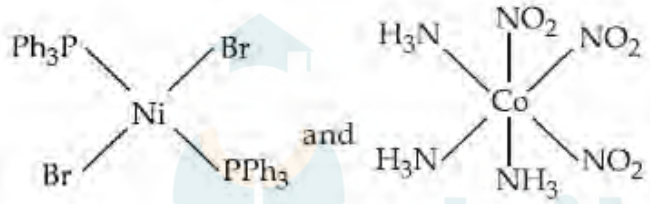
**Q.9** The correct structures of trans-$[NiBr_2(PPh_3)_2]$ and meridonial-$[Co(NH_3)_3(NO_2)_3]$, respectively, are :

**Options**

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **8643514720**
Option 1 ID : **86435114168**
Option 2 ID : **86435114167**
Option 3 ID : **86435114170**
Option 4 ID : **86435114169**
Status : **Answered**
Chosen Option : **4**

**Q.10** A non-reducing sugar "A" hydrolyses to give two reducing mono saccharides. Sugar A is :

**Options**

1. Sucrose
2. Glucose
3. Fructose
4. Galactose

Question Type : **MCQ**
Question ID : **8643514729**
Option 1 ID : **86435114206**
Option 2 ID : **86435114203**
Option 3 ID : **86435114204**
Option 4 ID : **86435114205**
Status : **Answered**
Chosen Option : **1**

**Q.11** Match List - I with List - II :

| List - I | | List - II | |
|---|---|---|---|
| (a) | $Ca(OCl)_2$ | (i) | Antacid |
| (b) | $CaSO_4 \cdot \frac{1}{2}H_2O$ | (ii) | Cement |
| (c) | $CaO$ | (iii) | Bleach |
| (d) | $CaCO_3$ | (iv) | Plaster of Paris |

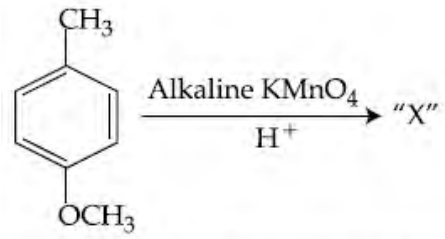
Choose the **most appropriate** answer from the options given below :

**Options**

1. (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)
2. (a)-(i), (b)-(iv), (c)-(iii), (d)-(ii)
3. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
4. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

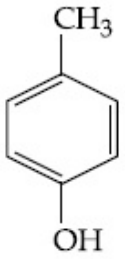
Question Type : **MCQ**
Question ID : **8643514717**
Option 1 ID : **86435114156**
Option 2 ID : **86435114155**
Option 3 ID : **86435114157**
Option 4 ID : **86435114158**
Status : **Answered**
Chosen Option : **2**

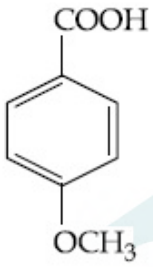
**Q.12**

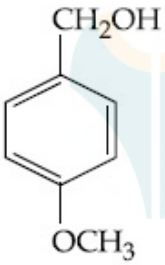


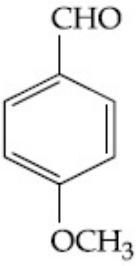

Considering the above chemical reaction, identify the product "X" :

**Options**

1. X - 


2. X - 


3. X - 

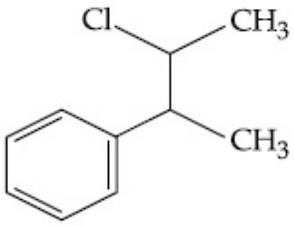

4. X - 

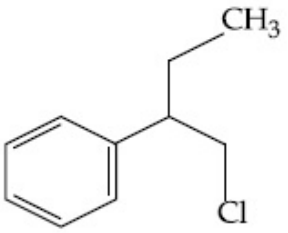

Question Type : **MCQ**
Question ID : **8643514726**
Option 1 ID : **86435114194**
Option 2 ID : **86435114192**
Option 3 ID : **86435114191**
Option 4 ID : **86435114193**
Status : **Answered**
Chosen Option : **2**

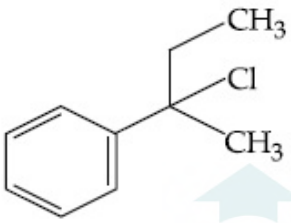
**Q.13** Reaction of Grignard reagent, $C_2H_5MgBr$ with $C_8H_8O$ followed by hydrolysis gives compound "A" which reacts instantly with Lucas reagent to give compound B, $C_{10}H_{13}Cl$.

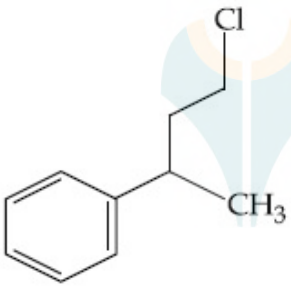
The Compound B is :

**Options**

1. 


2. 


3. 


4. 


Question Type : **MCQ**
Question ID : **8643514724**
Option 1 ID : **86435114185**
Option 2 ID : **86435114184**
Option 3 ID : **86435114186**
Option 4 ID : **86435114183**
Status : **Answered**
Chosen Option : **3**

**Q.14** Match List - I with List - II :

| List - I | | List - II | |
|---|---|---|---|
| (a) | Chlorophyll | (i) | Ruthenium |
| (b) | Vitamin - $B_{12}$ | (ii) | Platinum |
| (c) | Anticancer drug | (iii) | Cobalt |
| (d) | Grubbs catalyst | (iv) | Magnesium |

Choose the **most appropriate** answer from the options given below :

**Options**

1. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
2. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
3. (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
4. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

Question Type : **MCQ**
Question ID : **8643514719**
Option 1 ID : **86435114165**
Option 2 ID : **86435114166**
Option 3 ID : **86435114163**
Option 4 ID : **86435114164**
Status : **Answered**
Chosen Option : **2**

**Q.15** The statements that are TRUE :

(A) methane leads to both global warming and photochemical smog

(B) methane is generated from paddy fields

(C) methane is a stronger global warming gas than $CO_2$

(D) methane is a part of reducing smog.

Choose the **most appropriate** answer from the options given below :

**Options**

1. (B), (C), (D) only
2. (A), (B), (D) only
3. (A) and (B) only
4. (A), (B), (C) only

Question Type : **MCQ**
Question ID : **8643514721**
Option 1 ID : **86435114173**
Option 2 ID : **86435114174**
Option 3 ID : **86435114171**
Option 4 ID : **86435114172**
Status : **Answered**
Chosen Option : **4**

**Q.16**

Match List - I with List - II :

| | List - I (Class of Drug) | | List - II (Example) |
|---|---|---|---|
| (a) | Antacid | (i) | Novestrol |
| (b) | Artificial Sweetener | (ii) | Cimetidine |
| (c) | Antifertility | (iii) | Valium |
| (d) | Tranquilizers | (iv) | Alitame |

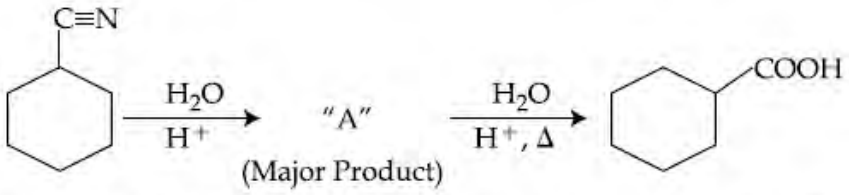
Choose the **most appropriate** match :

**Options**

1. (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
2. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
3. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)
4. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

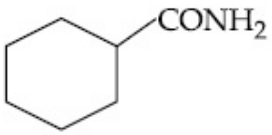
Question Type : **MCQ**
Question ID : **8643514728**
Option 1 ID : **86435114201**
Option 2 ID : **86435114200**
Option 3 ID : **86435114199**
Option 4 ID : **86435114202**
Status : **Answered**
Chosen Option : **4**

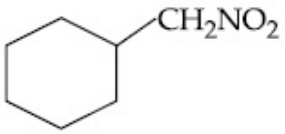
**Q.17**

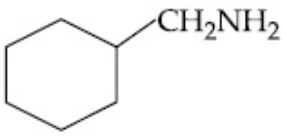


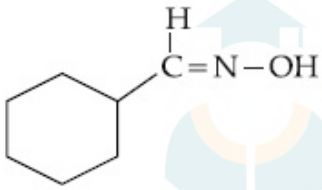

Consider the above chemical reaction and identify product "A" :

**Options**

1. 


2. 


3. 


4. 


Question Type : **MCQ**
Question ID : **8643514725**
Option 1 ID : **86435114188**
Option 2 ID : **86435114190**
Option 3 ID : **86435114187**
Option 4 ID : **86435114189**
Status : **Not Answered**
Chosen Option : **--**

**Q.18** The ionic radius of $Na^+$ ion is 1.02 Å. The ionic radii (in Å) of $Mg^{2+}$ and $Al^{3+}$, respectively, are :

**Options**

1. 1.05 and 0.99
2. 0.68 and 0.72
3. 0.85 and 0.99
4. 0.72 and 0.54

Question Type : **MCQ**
Question ID : **8643514714**
Option 1 ID : **86435114146**
Option 2 ID : **86435114145**
Option 3 ID : **86435114143**
Option 4 ID : **86435114144**
Status : **Answered**
Chosen Option : **4**

**Q.19** In a binary compound, atoms of element A form a hcp structure and those of element M occupy 2/3 of the tetrahedral voids of the hcp structure. The formula of the binary compound is :

**Options**

1. $MA_3$
2. $M_2A_3$
3. $M_4A_3$
4. $M_4A$

Question Type : **MCQ**
Question ID : **8643514711**
Option 1 ID : **86435114133**
Option 2 ID : **86435114131**
Option 3 ID : **86435114132**
Option 4 ID : **86435114134**
Status : **Answered**
Chosen Option : **3**

**Q.20** Compound with molecular formula $C_3H_6O$ can show :

**Options**

1. Functional group isomerism
2. Both positional isomerism and metamerism
3. Metamerism
4. Positional isomerism

Question Type : **MCQ**
Question ID : **8643514722**
Option 1 ID : **86435114176**
Option 2 ID : **86435114178**
Option 3 ID : **86435114177**
Option 4 ID : **86435114175**
Status : **Answered**
Chosen Option : **1**

Section : **Chemistry Section B**

**Q.1** In order to prepare a buffer solution of pH 5.74, sodium acetate is added to acetic acid. If the concentration of acetic acid in the buffer is 1.0 M, the concentration of sodium acetate in the buffer is _____ M. (Round off to the Nearest Integer).

[Given : pKa (acetic acid) = 4.74]

Given --
Answer :

Question Type : **SA**
Question ID : **8643514735**
Status : **Not Answered**

**Q.2** 2 molal solution of a weak acid HA has a freezing point of 3.885°C. The degree of dissociation of this acid is _____ $\times 10^{-3}$. (Round off to the Nearest Integer).

[Given : Molal depression constant of water = 1.85 K kg $mol^{-1}$

Freezing point of pure water = 0°C]

Given --
Answer :

Question Type : **SA**
Question ID : **8643514734**
Status : **Not Answered**

**Q.3** For the reaction

$$C_2H_6 \rightarrow C_2H_4 + H_2$$

the reaction enthalpy $\Delta_r H$ = _____ kJ $mol^{-1}$. (Round off to the Nearest Integer).

[Given : Bond enthalpies in kJ $mol^{-1}$ : C – C : 347, C = C : 611;

C – H : 414, H – H : 436]

Given **128**
Answer :

Question Type : **SA**
Question ID : **8643514733**
Status : **Answered**

**Q.4** Complete combustion of 3 g of ethane gives $x \times 10^{22}$ molecules of water. The value of $x$ is _____. (Round off to the Nearest Integer).

[Use : $N_A = 6.023 \times 10^{23}$; Atomic masses in u : C : 12.0 ; O : 16.0 ; H : 1.0]

Given **18**
Answer :

Question Type : **SA**
Question ID : **8643514731**
Status : **Answered**

**Q.5** A reaction of 0.1 mole of Benzylamine with bromomethane gave 23 g of Benzyl trimethyl ammonium bromide. The number of moles of bromomethane consumed in this reaction are $n \times 10^{-1}$, when n = _____. (Round off to the Nearest Integer).

[Given : Atomic masses : C : 12.0 u, H : 1.0 u, N : 14.0 u, Br : 80.0 u]

Given --
Answer :

Question Type : **SA**
Question ID : **8643514740**
Status : **Not Answered**

**Q.6** AX is a covalent diatomic molecule where A and X are second row elements of periodic table. Based on Molecular orbital theory, the bond order of AX is 2.5. The total number of electrons in AX is _____. (Round off to the Nearest Integer).

Given **15**
Answer :

Question Type : **SA**
Question ID : **8643514732**
Status : **Answered**

**Q.7** The total number of unpaired electrons present in the complex $K_3[Cr(oxalate)_3]$ is _____.

Given **3**
Answer :

Question Type : **SA**
Question ID : **8643514738**
Status : **Answered**

**Q.8** $2\,NO(g) + Cl_2(g) \rightleftharpoons 2\,NOCl(s)$

This reaction was studied at $-10^{\circ}C$ and the following data was obtained

| run | $[NO]_0$ | $[Cl_2]_0$ | $r_0$ |
|---|---|---|---|
| 1 | 0.10 | 0.10 | 0.18 |
| 2 | 0.10 | 0.20 | 0.35 |
| 3 | 0.20 | 0.20 | 1.40 |

$[NO]_0$ and $[Cl_2]_0$ are the initial concentrations and $r_0$ is the initial reaction rate.

The overall order of the reaction is _____. (Round off to the Nearest Integer).

Given **3**
Answer :

Question Type : **SA**
Question ID : **8643514737**
Status : **Answered**

**Q.9** _____ grams of 3-Hydroxy propanal (MW = 74) must be dehydrated to produce 7.8 g of acrolein (MW = 56) ($C_3H_4O$) if the percentage yield is 64. (Round off to the Nearest Integer).

[Given : Atomic masses : C : 12.0 u, H : 1.0 u, O : 16.0 u]

Given --
Answer :

Question Type : **SA**
Question ID : **8643514739**
Status : **Not Answered**

**Q.10** For the reaction

$2Fe^{3+}(aq) + 2I^-(aq) \rightarrow 2Fe^{2+}(aq) + I_2(s)$

the magnitude of the standard molar free energy change,

$\Delta_r G^\circ_m = -$ _____ kJ (Round off to the Nearest Integer).

$$\left[\begin{array}{ll} E^\circ_{Fe^{2+}/Fe(s)} = -0.440\ V\ ; & E^\circ_{Fe^{3+}/Fe(s)} = -0.036\ V \\ E^\circ_{I_2/2I^-} = 0.539\ V\ ; & F = 96500\ C \end{array}\right]$$

Given --
Answer :

Question Type : **SA**
Question ID : **8643514736**
Status : **Not Answered**

Section : **Mathematics Section A**

**Q.1** The equation of one of the straight lines which passes through the point (1, 3) and makes an angle $\tan^{-1}(\sqrt{2})$ with the straight line, $y + 1 = 3\sqrt{2}\,x$ is :

**Options**

1. $5\sqrt{2}\,x + 4y - (15 + 4\sqrt{2}) = 0$
2. $4\sqrt{2}\,x + 5y - (15 + 4\sqrt{2}) = 0$
3. $4\sqrt{2}\,x - 5y - (5 + 4\sqrt{2}) = 0$
4. $4\sqrt{2}\,x + 5y - 4\sqrt{2} = 0$

Question Type : **MCQ**
Question ID : **8643514758**
Option 1 ID : **86435114291**
Option 2 ID : **86435114289**
Option 3 ID : **86435114290**
Option 4 ID : **86435114292**
Status : **Answered**
Chosen Option : **2**

**Q.2** The value of $3+\cfrac{1}{4+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{3+\ldots\ldots\infty}}}}$ is equal to :

**Options**

1. $1.5+\sqrt{3}$
2. $2+\sqrt{3}$
3. $3+2\sqrt{3}$
4. $4+\sqrt{3}$

Question Type : **MCQ**
Question ID : **8643514747**
Option 1 ID : **86435114245**
Option 2 ID : **86435114246**
Option 3 ID : **86435114247**
Option 4 ID : **86435114248**
Status : **Not Answered**
Chosen Option : **--**

**Q.3** Let $\alpha, \beta, \gamma$ be the real roots of the equation, $x^3+ax^2+bx+c=0$, (a, b, c $\in$ R and a, b $\neq$ 0). If the system of equations (in $u, v, w$) given by $\alpha u+\beta v+\gamma w=0$; $\beta u+\gamma v+\alpha w=0$; $\gamma u+\alpha v+\beta w=0$ has non-trivial solution, then the value of $\frac{a^2}{b}$ is :

**Options**

1. 1
2. 5
3. 0
4. 3

Question Type : **MCQ**
Question ID : **8643514744**
Option 1 ID : **86435114234**
Option 2 ID : **86435114236**
Option 3 ID : **86435114233**
Option 4 ID : **86435114235**
Status : **Answered**
Chosen Option : **3**

**Q.4**

The integral $\int \frac{(2x-1)\cos\sqrt{(2x-1)^2+5}}{\sqrt{4x^2-4x+6}}\,dx$ is equal to :

(where c is a constant of integration)

**Options**

1. $\frac{1}{2}\cos\sqrt{(2x+1)^2+5}+c$
2. $\frac{1}{2}\sin\sqrt{(2x-1)^2+5}+c$
3. $\frac{1}{2}\sin\sqrt{(2x+1)^2+5}+c$
4. $\frac{1}{2}\cos\sqrt{(2x-1)^2+5}+c$

Question Type : **MCQ**
Question ID : **8643514753**
Option 1 ID : **86435114272**
Option 2 ID : **86435114270**
Option 3 ID : **86435114269**
Option 4 ID : **86435114271**
Status : **Not Answered**
Chosen Option : **--**

**Q.5**

If $\alpha$, $\beta$ are natural numbers such that $100^{\alpha}-199\beta=(100)(100)+(99)(101)+(98)(102)+$ $\ldots\ldots+(1)(199)$, then the slope of the line passing through $(\alpha, \beta)$ and origin is :

**Options**

1. 530
2. 510
3. 550
4. 540

Question Type : **MCQ**
Question ID : **8643514749**
Option 1 ID : **86435114254**
Option 2 ID : **86435114253**
Option 3 ID : **86435114256**
Option 4 ID : **86435114255**
Status : **Not Answered**
Chosen Option : **--**

**Q.6** If the equation $a|z|^2 + \overline{\bar{\alpha}z + \alpha\bar{z}} + d = 0$ represents a circle where a, d are real constants, then which of the following condition is correct ?

**Options**

1. $|\alpha|^2 - ad > 0$ and $a \in R - \{0\}$
2. $|\alpha|^2 - ad \geq 0$ and $a \in R$
3. $|\alpha|^2 - ad \neq 0$
4. $\alpha = 0$, $a, d \in R^+$

Question Type : **MCQ**
Question ID : **8643514742**
Option 1 ID : **86435114226**
Option 2 ID : **86435114225**
Option 3 ID : **86435114227**
Option 4 ID : **86435114228**
Status : **Not Answered**
Chosen Option : **--**

**Q.7** If $f(x) = \begin{cases} \frac{1}{|x|} & ; |x| \geq 1 \\ ax^2 + b & ; |x| < 1 \end{cases}$ is differentiable at every point of the domain, then the values of a and b are respectively :

**Options**

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

Question Type : **MCQ**
Question ID : **8643514750**
Option 1 ID : **86435114259**
Option 2 ID : **86435114257**
Option 3 ID : **86435114260**
Option 4 ID : **86435114258**
Status : **Answered**
Chosen Option : **4**

**Q.8** The differential equation satisfied by the system of parabolas $y^2 = 4a(x + a)$ is :

**Options**

1. $y\left(\frac{dy}{dx}\right)^2 - 2x\left(\frac{dy}{dx}\right) + y = 0$
2. $y\left(\frac{dy}{dx}\right)^2 - 2x\left(\frac{dy}{dx}\right) - y = 0$
3. $y\left(\frac{dy}{dx}\right)^2 + 2x\left(\frac{dy}{dx}\right) - y = 0$
4. $y\left(\frac{dy}{dx}\right) + 2x\left(\frac{dy}{dx}\right) - y = 0$

Question Type : **MCQ**
Question ID : **8643514754**
Option 1 ID : **86435114275**
Option 2 ID : **86435114276**
Option 3 ID : **86435114273**
Option 4 ID : **86435114274**
Status : **Not Answered**
Chosen Option : **--**

**Q.9** For the four circles M, N, O and P, following four equations are given :

Circle M : $x^2 + y^2 = 1$

Circle N : $x^2 + y^2 - 2x = 0$

Circle O : $x^2 + y^2 - 2x - 2y + 1 = 0$

Circle P : $x^2 + y^2 - 2y = 0$

If the centre of circle M is joined with centre of the circle N, further centre of circle N is joined with centre of the circle O, centre of circle O is joined with the centre of circle P and lastly, centre of circle P is joined with centre of circle M, then these lines form the sides of a :

**Options**

1. Rectangle
2. Square
3. Rhombus
4. Parallelogram

Question Type : **MCQ**
Question ID : **8643514756**
Option 1 ID : **86435114281**
Option 2 ID : **86435114283**
Option 3 ID : **86435114282**
Option 4 ID : **86435114284**
Status : **Answered**
Chosen Option : **2**

**Q.10** If the functions are defined as $f(x)=\sqrt{x}$ and $g(x)=\sqrt{1-x}$, then what is the common domain of the following functions : $f+g$, $f-g$, $f/g$, $g/f$, $g-f$ where $(f \pm g)(x)=f(x) \pm g(x), (f/g)(x)=\frac{f(x)}{g(x)}$

**Options**

1. $0 \leq x < 1$
2. $0 < x \leq 1$
3. $0 \leq x \leq 1$
4. $0 < x < 1$

Question Type : **MCQ**
Question ID : **8643514741**
Option 1 ID : **86435114221**
Option 2 ID : **86435114224**
Option 3 ID : **86435114223**
Option 4 ID : **86435114222**
Status : **Answered**
Chosen Option : **4**

**Q.11** The number of integral values of m so that the abscissa of point of intersection of lines $3x+4y=9$ and $y=mx+1$ is also an integer, is :

**Options**

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

Question Type : **MCQ**
Question ID : **8643514757**
Option 1 ID : **86435114287**
Option 2 ID : **86435114286**
Option 3 ID : **86435114288**
Option 4 ID : **86435114285**
Status : **Answered**
Chosen Option : **1**

**Q.12** Let $A+2B=\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}$ and $2A-B=\begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}$. If Tr(A) denotes the sum of all diagonal elements of the matrix A, then Tr(A) – Tr(B) has value equal to :

**Options**

1. $0$
2. $2$
3. $3$
4. $1$

Question Type : **MCQ**
Question ID : **8643514743**
Option 1 ID : **86435114232**
Option 2 ID : **86435114230**
Option 3 ID : **86435114231**
Option 4 ID : **86435114229**
Status : **Answered**
Chosen Option : **2**

**Q.13** Let $(1+x+2x^2)^{20}=a_0+a_1x+a_2x^2+....+a_{40}x^{40}$. Then, $a_1+a_3+a_5+.....+a_{37}$ is equal to :

**Options**

1. $2^{19}(2^{20}+21)$
2. $2^{20}(2^{20}+21)$
3. $2^{19}(2^{20}-21)$
4. $2^{20}(2^{20}-21)$

Question Type : **MCQ**
Question ID : **8643514746**
Option 1 ID : **86435114241**
Option 2 ID : **86435114242**
Option 3 ID : **86435114243**
Option 4 ID : **86435114244**
Status : **Answered**
Chosen Option : **4**

**Q.14** The solutions of the equation

$$\begin{vmatrix} 1+\sin^2 x & \sin^2 x & \sin^2 x \\ \cos^2 x & 1+\cos^2 x & \cos^2 x \\ 4\sin 2x & 4\sin 2x & 1+4\sin 2x \end{vmatrix} = 0, (0 < x < \pi), \text{ are :}$$

**Options**

1. $\frac{\pi}{6}, \frac{5\pi}{6}$
2. $\frac{7\pi}{12}, \frac{11\pi}{12}$
3. $\frac{5\pi}{12}, \frac{7\pi}{12}$
4. $\frac{\pi}{12}, \frac{\pi}{6}$

Question Type : **MCQ**
Question ID : **8643514759**
Option 1 ID : **86435114293**
Option 2 ID : **86435114295**
Option 3 ID : **86435114294**
Option 4 ID : **86435114296**
Status : **Answered**
Chosen Option : **3**

**Q.15** A vector $\vec{a}$ has components 3p and 1 with respect to a rectangular cartesian system. This system is rotated through a certain angle about the origin in the counter clockwise sense. If, with respect to new system, $\vec{a}$ has components $p+1$ and $\sqrt{10}$, then a value of p is equal to :

**Options**

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

Question Type : **MCQ**
Question ID : **8643514760**
Option 1 ID : **86435114300**
Option 2 ID : **86435114299**
Option 3 ID : **86435114297**
Option 4 ID : **86435114298**
Status : **Not Answered**
Chosen Option : **--**

**Q.16** If $\lim_{x\to 0}\frac{\sin^{-1}x-\tan^{-1}x}{3x^3}$ is equal to L, then the value of $(6L+1)$ is :

**Options**

1. $2$
2. $\frac{1}{2}$
3. $\frac{1}{6}$
4. $6$

Question Type : **MCQ**
Question ID : **8643514752**
Option 1 ID : **86435114267**
Option 2 ID : **86435114268**
Option 3 ID : **86435114265**
Option 4 ID : **86435114266**
Status : **Answered**
Chosen Option : **1**

**Q.17** $\frac{1}{3^2-1}+\frac{1}{5^2-1}+\frac{1}{7^2-1}+.....+\frac{1}{(201)^2-1}$ is equal to :

**Options**

1. $\frac{101}{404}$
2. $\frac{25}{101}$
3. $\frac{101}{408}$
4. $\frac{99}{400}$

Question Type : **MCQ**
Question ID : **8643514748**
Option 1 ID : **86435114252**
Option 2 ID : **86435114249**
Option 3 ID : **86435114250**
Option 4 ID : **86435114251**
Status : **Not Answered**
Chosen Option : **--**

**Q.18** Choose the correct statement about two circles whose equations are given below :

$x^2+y^2-10x-10y+41=0$

$x^2+y^2-22x-10y+137=0$

**Options**

1. circles have same centre
2. circles have two meeting points
3. circles have only one meeting point
4. circles have no meeting point

Question Type : **MCQ**
Question ID : **8643514755**
Option 1 ID : **86435114280**
Option 2 ID : **86435114277**
Option 3 ID : **86435114279**
Option 4 ID : **86435114278**
Status : **Answered**
Chosen Option : **3**

**Q.19** The real valued function $f(x)=\frac{\text{cosec}^{-1}x}{\sqrt{x-[x]}}$, where $[x]$ denotes the greatest integer less than or equal to $x$, is defined for all $x$ belonging to :

**Options**

1. all integers except $0, -1, 1$
2. all reals except the interval $[-1, 1]$
3. all reals except integers
4. all non-integers except the interval $[-1, 1]$

Question Type : **MCQ**
Question ID : **8643514751**
Option 1 ID : **86435114264**
Option 2 ID : **86435114262**
Option 3 ID : **86435114261**
Option 4 ID : **86435114263**
Status : **Answered**
Chosen Option : **4**

**Q.20** The sum of all the 4-digit distinct numbers that can be formed with the digits 1, 2, 2 and 3 is :

**Options**
1. 22264
2. 122234
3. 26664
4. 122664

Question Type : **MCQ**
Question ID : **8643514745**
Option 1 ID : **86435114237**
Option 2 ID : **86435114239**
Option 3 ID : **86435114238**
Option 4 ID : **86435114240**
Status : **Answered**
Chosen Option : **3**

Section : **Mathematics Section B**

**Q.1** Let $f(x)$ and $g(x)$ be two functions satisfying $f(x^2)+g(4-x)=4x^3$ and $g(4-x)+g(x)=0$, then the value of $\int_{-4}^{4} f(x^2)dx$ is _____.

Given Answer : **--**

Question Type : **SA**
Question ID : **8643514762**
Status : **Not Answered**

**Q.2** The equation of the planes parallel to the plane $x-2y+2z-3=0$ which are at unit distance from the point (1, 2, 3) is $ax+by+cz+d=0$. If $(b-d)=K(c-a)$, then the positive value of K is _____.

Given Answer : **4**

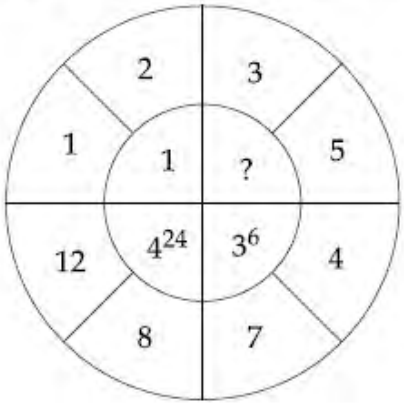
Question Type : **SA**
Question ID : **8643514766**
Status : **Answered**

**Q.3** The number of times the digit 3 will be written when listing the integers from 1 to 1000 is _____.

Given Answer : **111**

Question Type : **SA**
Question ID : **8643514768**
Status : **Answered**

**Q.4** The missing value in the following figure is _____.




Given **4**
Answer :

Question Type : **SA**
Question ID : **8643514769**
Status : **Answered**

**Q.5** Let the plane $ax + by + cz + d = 0$ bisect the line joining the points $(4, -3, 1)$ and $(2, 3, -5)$ at the right angles. If a, b, c, d are integers, then the minimum value of $(a^2 + b^2 + c^2 + d^2)$ is _____.

Given **--**
Answer :

Question Type : **SA**
Question ID : **8643514765**
Status : **Not Answered**

**Q.6** If $f(x) = \int \frac{5x^8 + 7x^6}{(x^2 + 1 + 2x^7)^2}\,dx$, $(x \geq 0)$, $f(0) = 0$ and $f(1) = \frac{1}{K}$, then the value of K is _____.

Given **--**
Answer :

Question Type : **SA**
Question ID : **8643514763**
Status : **Not Answered**

**Q.7** A square ABCD has all its vertices on the curve $x^2y^2 = 1$. The midpoints of its sides also lie on the same curve. Then, the square of area of ABCD is _____.

Given **--**
Answer :

Question Type : **SA**
Question ID : **8643514764**
Status : **Not Answered**

**Q.8** Let $z_1$, $z_2$ be the roots of the equation $z^2+az+12=0$ and $z_1$, $z_2$ form an equilateral triangle with origin. Then, the value of $|a|$ is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **8643514761**
Status : **Not Answered**

**Q.9** The mean age of 25 teachers in a school is 40 years. A teacher retires at the age of 60 years and a new teacher is appointed in his place. If the mean age of the teachers in this school now is 39 years, then the age (in years) of the newly appointed teacher is _____.

Given **35**
Answer :

Question Type : **SA**
Question ID : **8643514767**
Status : **Answered**

**Q.10** The number of solutions of the equation $|\cot x| = \cot x + \frac{1}{\sin x}$ in the interval $[0, 2\pi]$ is _____.

Given **2**
Answer :

Question Type : **SA**
Question ID : **8643514770**
Status : **Answered**