NTA JEE 7th to 9th Jan 2020

Application No.	
Candidate Name	
Roll No.	
Test Date	09/01/2020
Test Time	9:30 AM - 12:30 PM
Subject	BTECH

Section : **Physics**

Q.1 An electric dipole of moment $\vec{p} = (-\hat{i} - 3\hat{j} + 2\hat{k}) \times 10^{-29}$ C.m is at the origin (0, 0, 0). The electric field due to this dipole at $\vec{r} = +\hat{i} + 3\hat{j} + 5\hat{k}$ (note that $\vec{r} \cdot \vec{p} = 0$) is parallel to :

Options

1. $(+\hat{i} - 3\hat{j} - 2\hat{k})$
2. $(-\hat{i} - 3\hat{j} + 2\hat{k})$
3. $(+\hat{i} + 3\hat{j} - 2\hat{k})$
4. $(-\hat{i} + 3\hat{j} - 2\hat{k})$

Correct Answer: **Option 1**

Question Type : **MCQ**
Question ID : **4050361929**
Option 1 ID : **4050366939**
Option 2 ID : **4050366936**
Option 3 ID : **4050366937**
Option 4 ID : **4050366938**
Status : **Answered**
Chosen Option : **3**

Q.2

Consider two ideal diatomic gases A and B at some temperature T. Molecules of the gas A are rigid, and have a mass m. Molecules of the gas B have an additional vibrational mode, and have a mass $\frac{m}{4}$. The ratio of the specific heats (C_V^A and C_V^B) of gas A and B, respectively is :

Options

1. $5:9$
2. $7:9$
3. $3:5$
4. $5:7$

Correct Answer: **Option 1**

Question Type : **MCQ**
Question ID : **4050361926**
Option 1 ID : **4050366927**
Option 2 ID : **4050366926**
Option 3 ID : **4050366924**
Option 4 ID : **4050366925**
Status : **Answered**
Chosen Option : **4**

Q.3

Two particles of equal mass m have respective initial velocities $u\hat{i}$ and $u\left(\frac{\hat{i}+\hat{j}}{2}\right)$. They collide completely inelastically. The energy lost in the process is :

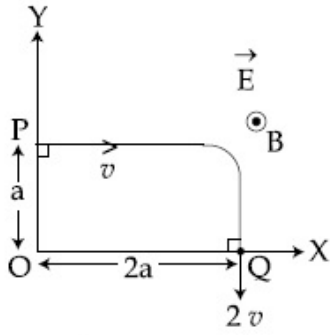
Options

1. $\frac{3}{4}mu^2$
2. $\sqrt{\frac{2}{3}}mu^2$
3. $\frac{1}{3}mu^2$
4. $\frac{1}{8}mu^2$

Correct Answer: **Option 1**

Question Type : **MCQ**
Question ID : **4050361921**
Option 1 ID : **4050366905**
Option 2 ID : **4050366906**
Option 3 ID : **4050366907**
Option 4 ID : **4050366904**
Status : **Answered**
Chosen Option : **4**

Q.4 A charged particle of mass 'm' and charge 'q' moving under the influence of uniform electric field $E\vec{i}$ and a uniform magnetic field $B\vec{k}$ follows a trajectory from point P to Q as shown in figure. The velocities at P and Q are respectively, $v\vec{i}$ and $-2v\vec{j}$. Then which of the following statements (A, B, C, D) are the correct ? (Trajectory shown is schematic and not to scale)



(A) $E = \frac{3}{4}\left(\frac{mv^2}{qa}\right)$

(B) Rate of work done by the electric field at P is $\frac{3}{4}\left(\frac{mv^3}{a}\right)$

(C) Rate of work done by both the fields at Q is zero

(D) The difference between the magnitude of angular momentum of the particle at P and Q is 2 mav.

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

Correct Answer: **Option 1**

Question Type : **MCQ**
Question ID : **4050361931**
Option 1 ID : **4050366946**
Option 2 ID : **4050366947**
Option 3 ID : **4050366944**
Option 4 ID : **4050366945**
Status : **Answered**
Chosen Option : **3**

Q.5 A particle moving with kinetic energy E has de Broglie wavelength λ. If energy ΔE is added to its energy, the wavelength become λ/2. Value of ΔE, is :

Options
1. 2E
2. 4E
3. 3E
4. E

Question Type : **MCQ**
Question ID : **4050361935**
Option 1 ID : **4050366961**
Option 2 ID : **4050366963**
Option 3 ID : **4050366962**
Option 4 ID : **4050366960**
Status : **Answered**
Chosen Option : **3**

Q.6 A vessel of depth 2h is half filled with a liquid of refractive index $2\sqrt{2}$ and the upper half with another liquid of refractive index $\sqrt{2}$. The liquids are immiscible. The apparent depth of the inner surface of the bottom of vessel will be :

Options
1. $\frac{h}{\sqrt{2}}$
2. $\frac{3}{4}h\sqrt{2}$
3. $\frac{h}{3\sqrt{2}}$
4. $\frac{h}{2(\sqrt{2}+1)}$

Correct Answer: **Option 1**

Question Type : **MCQ**
Question ID : **4050361933**
Option 1 ID : **4050366952**
Option 2 ID : **4050366953**
Option 3 ID : **4050366955**
Option 4 ID : **4050366954**
Status : **Answered**
Chosen Option : **2**

Q.7

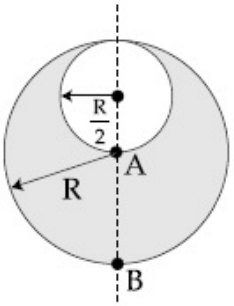
Radiation, with wavelength 6561 Å falls on a metal surface to produce photoelectrons. The electrons are made to enter a uniform magnetic field of 3×10^{-4} T. If the radius of the largest circular path followed by the electrons is 10 mm, the work function of the metal is close to :

Options

1. 0.8 eV
2. 1.1 eV
3. 1.8 eV
4. 1.6 eV

Question Type : **MCQ**
Question ID : **4050361936**
Option 1 ID : **4050366964**
Option 2 ID : **4050366965**
Option 3 ID : **4050366967**
Option 4 ID : **4050366966**
Status : **Answered**
Chosen Option : **2**

Q.8 Consider a sphere of radius R which carries a uniform charge density ρ. If a sphere of radius $\frac{R}{2}$ is carved out of it, as shown, the ratio $\frac{\left|\vec{E}_A\right|}{\left|\vec{E}_B\right|}$ of magnitude of electric field $\vec{E}_A$ and $\vec{E}_B$, respectively, at points A and B due to the remaining portion is :

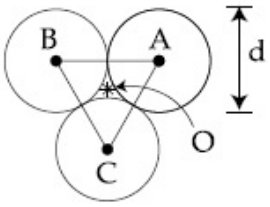


Options

1. $\frac{21}{34}$
2. $\frac{18}{54}$
3. $\frac{17}{54}$
4. $\frac{18}{34}$

Question Type : **MCQ**
Question ID : **4050361928**
Option 1 ID : **4050366933**
Option 2 ID : **4050366935**
Option 3 ID : **4050366934**
Option 4 ID : **4050366932**
Status : **Not Answered**
Chosen Option : **--**

Q.9



Three solid spheres each of mass m and diameter d are stuck together such that the lines connecting the centres form an equilateral triangle of side of length d. The ratio I_0/I_A of moment of inertia I_0 of the system about an axis passing the centroid and about center of any of the spheres I_A and perpendicular to the plane of the triangle is :

Options

1. $\frac{15}{13}$

2. $\frac{13}{15}$

3. $\frac{13}{23}$

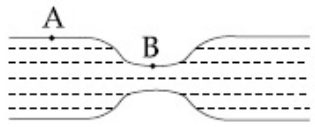
4. $\frac{23}{13}$

Question Type : **MCQ**
Question ID : **4050361922**
Option 1 ID : **4050366911**
Option 2 ID : **4050366909**
Option 3 ID : **4050366908**
Option 4 ID : **4050366910**
Status : **Answered**
Chosen Option : **3**

Q.10

Water flows in a horizontal tube (see figure). The pressure of water changes by $700\ Nm^{-2}$ between A and B where the area of cross section are $40\ cm^2$ and $20\ cm^2$, respectively. Find the rate of flow of water through the tube.

(density of water $=1000\ kgm^{-3}$)



(Fig)

Options

1. $3020\ cm^3/s$
2. $2420\ cm^3/s$
3. $2720\ cm^3/s$
4. $1810\ cm^3/s$

Question Type : **MCQ**
Question ID : **4050361924**
Option 1 ID : **4050366919**
Option 2 ID : **4050366917**
Option 3 ID : **4050366918**
Option 4 ID : **4050366916**
Status : **Answered**
Chosen Option : **3**

Q.11

Three harmonic waves having equal frequency ν and same intensity I_0, have phase angles $0, \frac{\pi}{4}$ and $-\frac{\pi}{4}$ respectively. When they are superimposed the intensity of the resultant wave is close to :

Options

1. $0.2\ I_0$
2. I_0
3. $3\ I_0$
4. $5.8\ I_0$

Question Type : **MCQ**
Question ID : **4050361927**
Option 1 ID : **4050366929**
Option 2 ID : **4050366928**
Option 3 ID : **4050366930**
Option 4 ID : **4050366931**
Status : **Answered**
Chosen Option : **4**

Q.12 The aperture diameter of a telescope is 5 m. The separation between the moon and the earth is 4×10^5 km. With light of wavelength of 5500 Å, the minimum separation between objects on the surface of moon, so that they are just resolved, is close to :

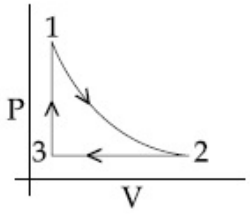
Options
1. 600 m
2. 20 m
3. 60 m
4. 200 m

Question Type : **MCQ**
Question ID : **4050361934**
Option 1 ID : **4050366959**
Option 2 ID : **4050366956**
Option 3 ID : **4050366957**
Option 4 ID : **4050366958**
Status : **Answered**
Chosen Option : **4**

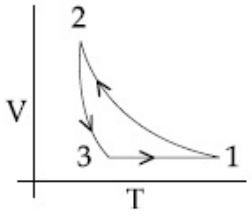
Q.13

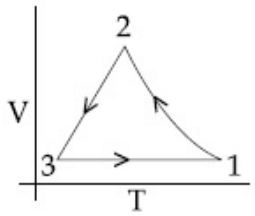
Which of the following is an equivalent cyclic process corresponding to the thermodynamic cyclic given in the figure? where, $1 \rightarrow 2$ is adiabatic.

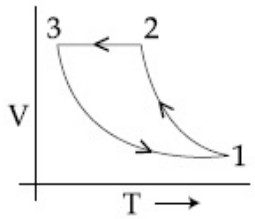
(Graphs are schematic and are not to scale)

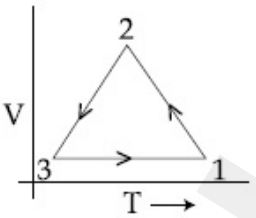


Options

1.


2.


3.


4.


Question Type : **MCQ**
Question ID : **4050361925**
Option 1 ID : **4050366921**
Option 2 ID : **4050366920**
Option 3 ID : **4050366922**
Option 4 ID : **4050366923**
Status : **Answered**
Chosen Option : **2**

Q.14 The electric fields of two plane electromagnetic plane waves in vacuum are given by

$\vec{E}_1 = E_0\hat{j}\ \cos(\omega t - kx)$ and

$\vec{E}_2 = E_0\hat{k}\ \cos(\omega t - ky)$

At t=0, a particle of charge q is at origin with a velocity $\vec{v} = 0.8\,c\hat{j}$ (c is the speed of light in vaccum). The instantaneous force experienced by the particle is :

Options

1. $E_0q\left(0.8\hat{i} - \hat{j} + 0.4\hat{k}\right)$

2. $E_0q\left(0.4\hat{i} - 3\hat{j} + 0.8\hat{k}\right)$

3. $E_0q\left(-0.8\hat{i} + \hat{j} + \hat{k}\right)$

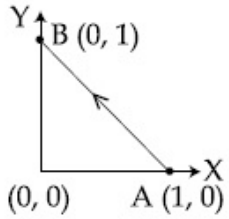
4. $E_0q\left(0.8\hat{i} + \hat{j} + 0.2\hat{k}\right)$

Question Type : **MCQ**
Question ID : **4050361932**
Option 1 ID : **4050366951**
Option 2 ID : **4050366950**
Option 3 ID : **4050366948**
Option 4 ID : **4050366949**
Status : **Answered**
Chosen Option : **3**

Q.15

Consider a force $\vec{F} = -x\hat{i} + y\hat{j}$. The work done by this force in moving a particle from point A(1, 0) to B(0, 1) along the line segment is :

(all quantities are in SI units)



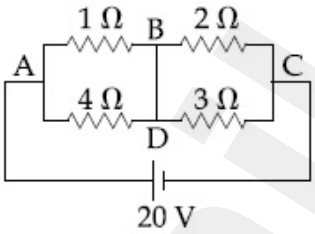
Options

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

Question Type : **MCQ**
Question ID : **4050361920**
Option 1 ID : **4050366901**
Option 2 ID : **4050366903**
Option 3 ID : **4050366902**
Option 4 ID : **4050366900**
Status : **Answered**
Chosen Option : **3**

Q.16

In the given circuit diagram, a wire is joining points B and D. The current in this wire is :



Options

1. 0.4A
2. zero
3. 2A
4. 4A

Question Type : **MCQ**
Question ID : **4050361938**
Option 1 ID : **4050366975**
Option 2 ID : **4050366972**
Option 3 ID : **4050366973**
Option 4 ID : **4050366974**
Status : **Answered**
Chosen Option : **4**

Q.17

A long, straight wire of radius a carries a current distributed uniformly over its cross-section. The ratio of the magnetic fields due to the wire at distance $\frac{a}{3}$ and 2a, respectively from the axis of the wire is :

Options

1. 3/2
2. 2
3. 2/3
4. 1/2

Question Type : **MCQ**
Question ID : **4050361930**
Option 1 ID : **4050366943**
Option 2 ID : **4050366941**
Option 3 ID : **4050366942**
Option 4 ID : **4050366940**
Status : **Answered**
Chosen Option : **1**

Q.18

A quantity f is given by $f = \sqrt{\frac{hc^5}{G}}$ where c is speed of light, G universal gravitational constant and h is the Planck's constant. Dimension of f is that of :

Options

1. area
2. volume
3. momentum
4. energy

Question Type : **MCQ**
Question ID : **4050361919**
Option 1 ID : **4050366898**
Option 2 ID : **4050366896**
Option 3 ID : **4050366897**
Option 4 ID : **4050366899**
Status : **Answered**
Chosen Option : **4**

Q.19 If the screw on a screw-gauge is given six rotations, it moves by 3 mm on the main scale. If there are 50 divisions on the circular scale the least count of the screw gauge is :

Options
1. 0.001 cm
2. 0.01 cm
3. 0.02 mm
4. 0.001 mm

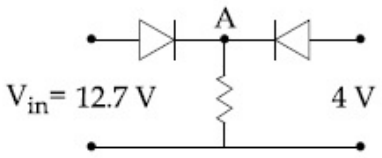
Question Type : **MCQ**
Question ID : **4050361937**
Option 1 ID : **4050366970**
Option 2 ID : **4050366968**
Option 3 ID : **4050366969**
Option 4 ID : **4050366971**
Status : **Answered**
Chosen Option : **1**

Q.20 A body A of mass m is moving in a circular orbit of radius R about a planet. Another body B of mass $\frac{m}{2}$ collides with A with a velocity which is half $\left(\frac{\vec{v}}{2}\right)$ the instantaneous velocity $\vec{v}$ of A. The collision is completely inelastic. Then, the combined body :

Options
1. Escapes from the Planet's Gravitational field
2. starts moving in an elliptical orbit around the planet
3. Falls vertically downwards towards the planet
4. continues to move in a circular orbit

Question Type : **MCQ**
Question ID : **4050361923**
Option 1 ID : **4050366912**
Option 2 ID : **4050366915**
Option 3 ID : **4050366913**
Option 4 ID : **4050366914**
Status : **Answered**
Chosen Option : **3**

Q.21 Both the diodes used in the circuit shown are assumed to be ideal and have negligible resistance when these are forward biased. Built in potential in each diode is 0.7 V. For the input voltages shown in the figure, the voltage (in Volts) at point A is _____.



Given **8.4**
Answer :

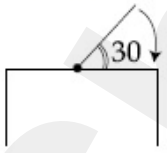
Question Type : **SA**
Question ID : **4050361943**
Status : **Answered**

Q.22 The distance x covered by a paritcle in one dimensional motion varies with time t as $x^2 = at^2 + 2bt + c$. If the acceleration of the particle depends on x as x^{-n}, where n is an integer, the value of n is _____.

Given **--**
Answer :

Question Type : **SA**
Question ID : **4050361939**
Status : **Not Answered**

Q.23 One end of a straight uniform 1 m long bar is pivoted on horizontal table. It is released from rest when it makes an angle 30° from the horizontal (see figure). Its angular speed when it hits the table is given as $\sqrt{n}\ s^{-1}$, where n is an integer. The value of n is _____.



Given **10**
Answer :

Question Type : **SA**
Question ID : **4050361940**
Status : **Answered**

Q.24 A body of mass $m = 10\,kg$ is attached to one end of a wire of length 0.3 m. The maximum angular speed (in rad s^{-1}) with which it can be rotated about its other end in space station is (Breaking stress of wire $= 4.8 \times 10^7\ Nm^{-2}$ and area of cross-section of the wire $= 10^{-2}\ cm^2$) is :

Given --
Answer :

Question Type : **SA**
Question ID : **4050361941**
Status : **Not Answered**

Q.25 In a fluorescent lamp choke (a small transformer) 100 V of reverse voltage is produced when the choke current changes uniformly from 0.25 A to 0 in a duration of 0.025 ms. The self-inductance of the choke (in mH) is estimated to be _____.

Given **10**
Answer :

Question Type : **SA**
Question ID : **4050361942**
Status : **Answered**

Section : **Chemistry**

Q.1 If the magnetic moment of a dioxygen species is 1.73 B.M, it may be :

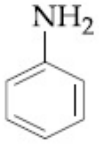
Options

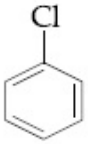
1. O_2, O_2^- or O_2^+
2. O_2^- or O_2^+
3. O_2 or O_2^-
4. O_2 or O_2^+

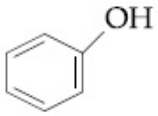
Question Type : **MCQ**
Question ID : **4050361945**
Option 1 ID : **4050366988**
Option 2 ID : **4050366987**
Option 3 ID : **4050366985**
Option 4 ID : **4050366986**
Status : **Answered**
Chosen Option : **1**

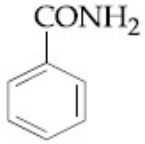
Q.2 Which of these will produce the highest yield in Friedel Crafts reaction ?

Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **4050361957**
Option 1 ID : **4050367033**
Option 2 ID : **4050367036**
Option 3 ID : **4050367034**
Option 4 ID : **4050367035**
Status : **Marked For Review**
Chosen Option : **2**

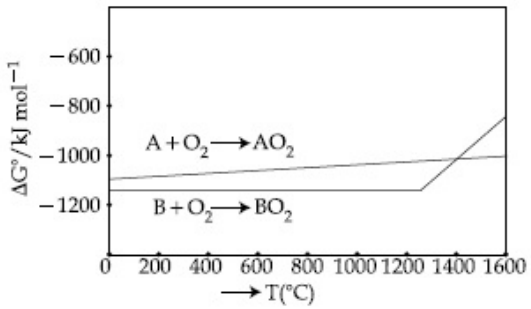
Q.3 'X' melts at low temperature and is a bad conductor of electricity in both liquid and solid state. X is :

Options

1. Carbon tetrachloride
2. Silicon carbide
3. Mercury
4. Zinc sulphide

Question Type : **MCQ**
Question ID : **4050361949**
Option 1 ID : **4050367002**
Option 2 ID : **4050367003**
Option 3 ID : **4050367004**
Option 4 ID : **4050367001**
Status : **Answered**
Chosen Option : **1**

Q.4 According to the following diagram, A reduces BO_2 when the temperature is :



Options
1. $> 1200\,^{\circ}C$ but $< 1400\,^{\circ}C$
2. $> 1400\,^{\circ}C$
3. $< 1200\,^{\circ}C$
4. $< 1400\,^{\circ}C$

Question Type : **MCQ**
Question ID : **4050361951**
Option 1 ID : **4050367011**
Option 2 ID : **4050367010**
Option 3 ID : **4050367012**
Option 4 ID : **4050367009**
Status : **Answered**
Chosen Option : **2**

Q.5 The de Broglie wavelength of an electron in the 4^{th} Bohr orbit is :

Options
1. $6\pi a_0$
2. $2\pi a_0$
3. $8\pi a_0$
4. $4\pi a_0$

Question Type : **MCQ**
Question ID : **4050361944**
Option 1 ID : **4050366983**
Option 2 ID : **4050366984**
Option 3 ID : **4050366982**
Option 4 ID : **4050366981**
Status : **Answered**
Chosen Option : **3**

Q.6 For following reactions

$$A \xrightarrow{700\ K} \text{Product}$$

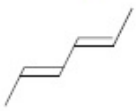
$$A \xrightarrow[\text{catalyst}]{500\ K} \text{Product}$$

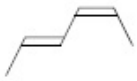
it was found that the E_a is decreased by 30 kJ/mol in the presence of catalyst. If the rate remains unchanged, the activation energy for catalysed reaction is (Assume pre exponential factor is same) :

Options
1. 198 kJ/mol
2. 105 kJ/mol
3. 75 kJ/mol
4. 135 kJ/mol

Question Type : **MCQ**
Question ID : **4050361947**
Option 1 ID : **4050366996**
Option 2 ID : **4050366993**
Option 3 ID : **4050366995**
Option 4 ID : **4050366994**
Status : **Answered**
Chosen Option : **2**

Q.7 The correct order of heat of combustion for following alkadienes is :

(a) 

(b) 

(c) 

Options
1. (b) < (c) < (a)
2. (a) < (b) < (c)
3. (a) < (c) < (b)
4. (c) < (b) < (a)

Question Type : **MCQ**
Question ID : **4050361962**
Option 1 ID : **4050367054**
Option 2 ID : **4050367056**
Option 3 ID : **4050367055**
Option 4 ID : **4050367053**
Status : **Answered**
Chosen Option : **4**

Q.8 Complex X of composition $Cr(H_2O)_6Cl_n$ has a spin only magnetic moment of 3.83 BM. It reacts with $AgNO_3$ and shows geometrical isomerism. The IUPAC nomenclature of X is :

Options

1. Tetraaquadichlorido chromium(IV) chloride dihydrate
2. Hexaaqua chromium(III) chloride
3. Dichloridotetraaqua chromium(IV) chloride dihydrate
4. Tetraaquadichlorido chromium(III) chloride dihydrate

Question Type : **MCQ**
Question ID : **4050361955**
Option 1 ID : **4050367026**
Option 2 ID : **4050367025**
Option 3 ID : **4050367028**
Option 4 ID : **4050367027**
Status : **Answered**
Chosen Option : **4**

Q.9 The electronic configurations of bivalent europium and trivalent cerium are :

(atomic number : Xe = 54, Ce = 58, Eu = 63)

Options

1. $[Xe]\ 4f^7$ and $[Xe]\ 4f^1$
2. $[Xe]\ 4f^7\ 6s^2$ and $[Xe]\ 4f^2\ 6s^2$
3. $[Xe]\ 4f^2$ and $[Xe]\ 4f^7$
4. $[Xe]\ 4f^4$ and $[Xe]\ 4f^9$

Question Type : **MCQ**
Question ID : **4050361954**
Option 1 ID : **4050367023**
Option 2 ID : **4050367021**
Option 3 ID : **4050367022**
Option 4 ID : **4050367024**
Status : **Answered**
Chosen Option : **1**

Q.10 B has a smaller first ionization enthalpy than Be. Consider the following statements :

(I) it is easier to remove 2p electron than 2s electron

(II) 2p electron of B is more shielded from the nucleus by the inner core of electrons than the 2s electrons of Be

(III) 2s electron has more penetration power than 2p electron

(IV) atomic radius of B is more than Be

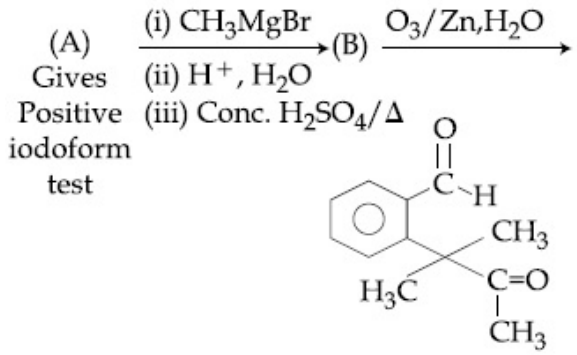
(atomic number B = 5, Be = 4)

The correct statements are :

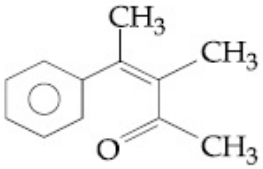
Options
1. (I), (II) and (III)
2. (II), (III) and (IV)
3. (I), (III) and (IV)
4. (I), (II) and (IV)

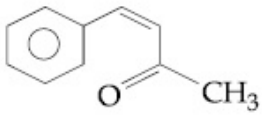
Question Type : **MCQ**
Question ID : **4050361950**
Option 1 ID : **4050367005**
Option 2 ID : **4050367007**
Option 3 ID : **4050367008**
Option 4 ID : **4050367006**
Status : **Answered**
Chosen Option : **1**

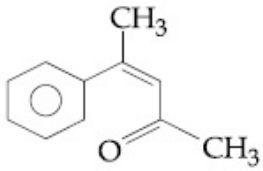
Q.11 Identify (A) in the following reaction sequence :

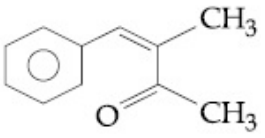


Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **4050361963**
Option 1 ID : **4050367058**
Option 2 ID : **4050367057**
Option 3 ID : **4050367059**
Option 4 ID : **4050367060**
Status : **Answered**
Chosen Option : **4**

Q.12 The acidic, basic and amphoteric oxides, respectively, are :

Options
1. Cl_2O, CaO, P_4O_{10}
2. N_2O_3, Li_2O, Al_2O_3
3. Na_2O, SO_3, Al_2O_3
4. MgO, Cl_2O, Al_2O_3

Question Type : **MCQ**
Question ID : **4050361952**
Option 1 ID : **4050367015**
Option 2 ID : **4050367014**
Option 3 ID : **4050367016**
Option 4 ID : **4050367013**
Status : **Answered**
Chosen Option : **2**

Q.13 The K_{sp} for the following dissociation is 1.6×10^{-5}

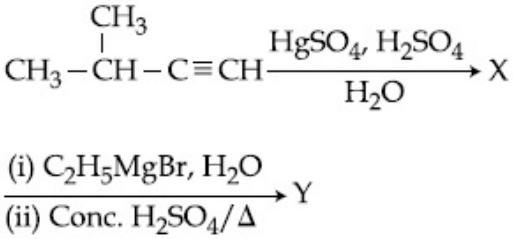
$$PbCl_{2(s)} \rightleftharpoons Pb^{2+}_{(aq)} + 2Cl^{-}_{(aq)}$$

Which of the following choices is correct for a mixture of 300 mL 0.134 M $Pb(NO_3)_2$ and 100 mL 0.4 M NaCl ?

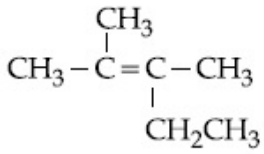
Options
1. $Q < K_{sp}$
2. $Q > K_{sp}$
3. $Q = K_{sp}$
4. Not enough data provided

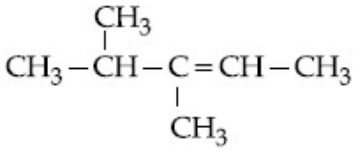
Question Type : **MCQ**
Question ID : **4050361948**
Option 1 ID : **4050367000**
Option 2 ID : **4050366997**
Option 3 ID : **4050366998**
Option 4 ID : **4050366999**
Status : **Not Answered**
Chosen Option : **--**

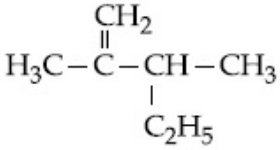
Q.14 The major product (Y) in the following reactions is :

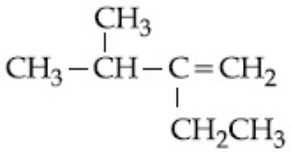


Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **4050361961**
Option 1 ID : **4050367049**
Option 2 ID : **4050367051**
Option 3 ID : **4050367052**
Option 4 ID : **4050367050**
Status : **Answered**
Chosen Option : **1**

Q.15 A chemist has 4 samples of artificial sweetener A, B, C and D. To identify these samples, he performed certain experiments and noted the following observations :

(i) A and D both form blue-violet colour with ninhydrin.

(ii) Lassaigne extract of C gives positive $AgNO_3$ test and negative $Fe_4[Fe(CN)_6]_3$ test.

(iii) Lassaigne extract of B and D gives positive sodium nitroprusside test.

Based on these observations which option is correct ?

Options

1. A : Alitame; B : Saccharin; C : Aspartame; D : Sucralose
2. A : Saccharin; B : Alitame; C : Sucralose; D : Aspartame
3. A : Aspartame; B : Alitame; C : Saccharin; D : Sucralose
4. A : Aspartame; B : Saccharin; C : Sucralose; D : Alitame

Question Type : **MCQ**
Question ID : **4050361959**
Option 1 ID : **4050367041**
Option 2 ID : **4050367044**
Option 3 ID : **4050367043**
Option 4 ID : **4050367042**
Status : **Not Answered**
Chosen Option : **--**

Q.16 The compound that cannot act both as oxidising and reducing agent is :

Options

1. H_2SO_3
2. H_3PO_4
3. HNO_2
4. H_2O_2

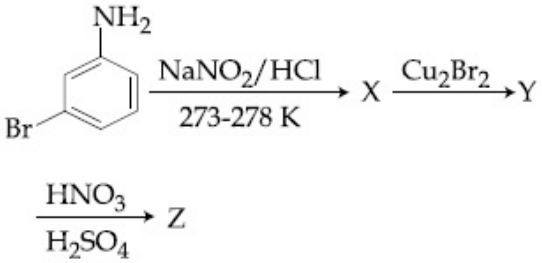
Question Type : **MCQ**
Question ID : **4050361953**
Option 1 ID : **4050367019**
Option 2 ID : **4050367020**
Option 3 ID : **4050367017**
Option 4 ID : **4050367018**
Status : **Answered**
Chosen Option : **2**

Q.17 If enthalpy of atomisation for $Br_{2(l)}$ is x kJ/mol and bond enthalpy for Br_2 is y kJ/mol, the relation between them :

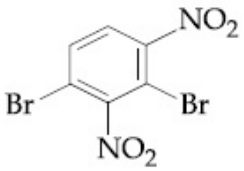
Options
1. is $x < y$
2. does not exist
3. is $x > y$
4. is $x = y$

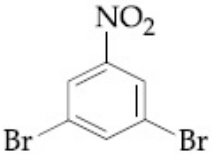
Question Type : **MCQ**
Question ID : **4050361946**
Option 1 ID : **4050366991**
Option 2 ID : **4050366992**
Option 3 ID : **4050366990**
Option 4 ID : **4050366989**
Status : **Marked For Review**
Chosen Option : **4**

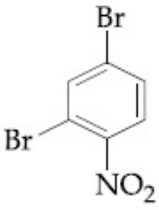
Q.18 The major product Z obtained in the following reaction scheme is :

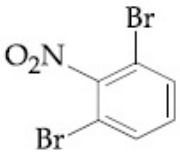


Options

1. 

2. 

3. 

4. 

Question Type : **MCQ**
Question ID : **4050361960**
Option 1 ID : **4050367048**
Option 2 ID : **4050367047**
Option 3 ID : **4050367045**
Option 4 ID : **4050367046**
Status : **Marked For Review**
Chosen Option : **2**

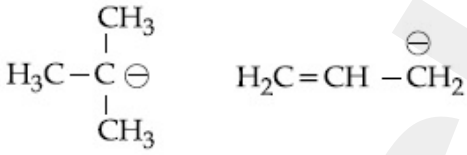
Q.19 $[Pd(F)(Cl)(Br)(I)]^{2-}$ has n number of geometrical isomers. Then, the spin-only magnetic moment and crystal field stabilisation energy [CFSE] of $[Fe(CN)_6]^{n-6}$, respectively, are :

[Note : Ignore the pairing energy]

Options
1. 1.73 BM and $-2.0\ \Delta_0$
2. 2.84 BM and $-1.6\ \Delta_0$
3. 0 BM and $-2.4\ \Delta_0$
4. 5.92 BM and 0

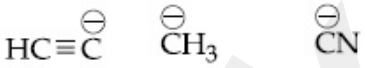
Question Type : **MCQ**
Question ID : **4050361956**
Option 1 ID : **4050367030**
Option 2 ID : **4050367031**
Option 3 ID : **4050367029**
Option 4 ID : **4050367032**
Status : **Not Answered**
Chosen Option : **--**

Q.20 The increasing order of basicity for the following intermediates is (from weak to strong)



(i)

(ii)



(iii) (iv) (v)

Options
1. (v) < (iii) < (ii) < (iv) < (i)
2. (iii) < (i) < (ii) < (iv) < (v)
3. (v) < (i) < (iv) < (ii) < (iii)
4. (iii) < (iv) < (ii) < (i) < (v)

Question Type : **MCQ**
Question ID : **4050361958**
Option 1 ID : **4050367038**
Option 2 ID : **4050367039**
Option 3 ID : **4050367037**
Option 4 ID : **4050367040**
Status : **Answered**
Chosen Option : **1**

Q.21 The hardness of a water sample containing 10^{-3} M $MgSO_4$ expressed as $CaCO_3$ equivalents (in ppm) is _____.
(molar mass of $MgSO_4$ is 120.37 g/mol)

Given --
Answer :

Question Type : **SA**
Question ID : **4050361967**
Status : **Not Answered**

Q.22 The molarity of HNO_3 in a sample which has density 1.4 g/mL and mass percentage of 63% is _____. (Molecular Weight of $HNO_3 = 63$)

Given **14**
Answer :

Question Type : **SA**
Question ID : **4050361964**
Status : **Answered**

Q.23 108 g of silver (molar mass 108 g mol^{-1}) is deposited at cathode from $AgNO_3(aq)$ solution by a certain quantity of electricity. The volume (in L) of oxygen gas produced at 273 K and 1 bar pressure from water by the same quantity of electricity is _____.

Given **11.35**
Answer :

Question Type : **SA**
Question ID : **4050361966**
Status : **Answered**

Q.24 The mass percentage of nitrogen in histamine is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **4050361968**
Status : **Not Answered**

Q.25 How much amount of NaCl should be added to 600 g of water ($\rho = 1.00$ g/mL) to decrease the freezing point of water to $-0.2°C$? _____. (The freezing point depression constant for water = 2 K kg mol^{-1})

Given --
Answer :

Question Type : **SA**
Question ID : **4050361965**
Status : **Not Answered**

Section : **Mathematics**

Q.1 Let C be the centroid of the triangle with vertices $(3, -1)$, $(1, 3)$ and $(2, 4)$. Let P be the point of intersection of the lines $x + 3y - 1 = 0$ and $3x - y + 1 = 0$. Then the line passing through the points C and P also passes through the point :

Options
1. $(-9, -7)$
2. $(-9, -6)$
3. $(7, 6)$
4. $(9, 7)$

Question Type : **MCQ**
Question ID : **4050361982**
Option 1 ID : **4050367119**
Option 2 ID : **4050367121**
Option 3 ID : **4050367118**
Option 4 ID : **4050367120**
Status : **Answered**
Chosen Option : **2**

Q.2 The product

$2^{\frac{1}{4}} \cdot 4^{\frac{1}{16}} \cdot 8^{\frac{1}{48}} \cdot 16^{\frac{1}{128}} \cdot \ldots$ to ∞

is equal to :

Options

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

Question Type : **MCQ**
Question ID : **4050361975**
Option 1 ID : **4050367093**
Option 2 ID : **4050367092**
Option 3 ID : **4050367091**
Option 4 ID : **4050367090**
Status : **Answered**
Chosen Option : **3**

Q.3 A spherical iron ball of 10 cm radius is coated with a layer of ice of uniform thickness that melts at a rate of $50\,cm^3/min$. When the thickness of ice is 5 cm, then the rate (in cm/min.) at which of the thickness of ice decreases, is :

Options

1. $\frac{5}{6\pi}$
2. $\frac{1}{54\pi}$
3. $\frac{1}{36\pi}$
4. $\frac{1}{18\pi}$

Question Type : **MCQ**
Question ID : **4050361977**
Option 1 ID : **4050367099**
Option 2 ID : **4050367101**
Option 3 ID : **4050367098**
Option 4 ID : **4050367100**
Status : **Not Answered**
Chosen Option : **--**

Q.4 Let f be any function continuous on [a, b] and twice differentiable on (a, b). If for all $x \in (a, b)$, $f'(x) > 0$ and $f''(x) < 0$, then for any $c \in (a, b)$, $\frac{f(c) - f(a)}{f(b) - f(c)}$ is greater than :

Options

1. $\frac{b - c}{c - a}$
2. 1
3. $\frac{c - a}{b - c}$
4. $\frac{b + a}{b - a}$

Question Type : **MCQ**
Question ID : **4050361978**
Option 1 ID : **4050367102**
Option 2 ID : **4050367104**
Option 3 ID : **4050367103**
Option 4 ID : **4050367105**
Status : **Answered**
Chosen Option : **3**

Q.5 The value of

$$\cos^3\left(\frac{\pi}{8}\right) \cdot \cos\left(\frac{3\pi}{8}\right) + \sin^3\left(\frac{\pi}{8}\right) \cdot \sin\left(\frac{3\pi}{8}\right)$$

is :

Options

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

Question Type : **MCQ**
Question ID : **4050361987**
Option 1 ID : **4050367141**
Option 2 ID : **4050367140**
Option 3 ID : **4050367139**
Option 4 ID : **4050367138**
Status : **Answered**
Chosen Option : **2**

Q.6 The number of real roots of the equation,
$e^{4x}+e^{3x}-4e^{2x}+e^{x}+1=0$ is :

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

Question Type : **MCQ**
Question ID : **4050361970**
Option 1 ID : **4050367072**
Option 2 ID : **4050367073**
Option 3 ID : **4050367070**
Option 4 ID : **4050367071**
Status : **Answered**
Chosen Option : **3**

Q.7 The value of $\int_0^{2\pi} \frac{x\sin^8 x}{\sin^8 x+\cos^8 x}dx$ is equal to :

Options
1. 2π
2. 4π
3. $2\pi^2$
4. π^2

Question Type : **MCQ**
Question ID : **4050361981**
Option 1 ID : **4050367115**
Option 2 ID : **4050367114**
Option 3 ID : **4050367116**
Option 4 ID : **4050367117**
Status : **Answered**
Chosen Option : **3**

Q.8 If for some α and β in R, the intersection of the following three planes

$x+4y-2z=1$

$x+7y-5z=\beta$

$x+5y+\alpha z=5$

is a line in R^3, then $\alpha+\beta$ is equal to :

Options
1. 0
2. 10
3. -10
4. 2

Question Type : **MCQ**
Question ID : **4050361973**
Option 1 ID : **4050367083**
Option 2 ID : **4050367085**
Option 3 ID : **4050367082**
Option 4 ID : **4050367084**
Status : **Not Answered**
Chosen Option : **--**

Q.9 If e_1 and e_2 are the eccentricities of the ellipse, $\frac{x^2}{18}+\frac{y^2}{4}=1$ and the hyperbola, $\frac{x^2}{9}-\frac{y^2}{4}=1$ respectively and (e_1, e_2) is a point on the ellipse, $15x^2+3y^2=k$, then k is equal to :

Options
1. 14
2. 15
3. 17
4. 16

Question Type : **MCQ**
Question ID : **4050361984**
Option 1 ID : **4050367129**
Option 2 ID : **4050367128**
Option 3 ID : **4050367126**
Option 4 ID : **4050367127**
Status : **Answered**
Chosen Option : **4**

Q.10

If $f(x) = \begin{cases} \dfrac{\sin(a+2)x + \sin x}{x} & ; x < 0 \\ b & ; x = 0 \\ \dfrac{(x+3x^2)^{1/3} - x^{1/3}}{x^{4/3}} & ; x > 0 \end{cases}$

is continuous at $x = 0$, then $a + 2b$ is equal to :

Options

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

Question Type : **MCQ**
Question ID : **4050361976**
Option 1 ID : **4050367097**
Option 2 ID : **4050367096**
Option 3 ID : **4050367095**
Option 4 ID : **4050367094**
Status : **Answered**
Chosen Option : **3**

Q.11

If the matrices $A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 3 & 4 \\ 1 & -1 & 3 \end{bmatrix}$, $B = \text{adj } A$

and $C = 3A$, then $\dfrac{|\text{adj } B|}{|C|}$ is equal to :

Options

1. 16
2. 2
3. 8
4. 72

Question Type : **MCQ**
Question ID : **4050361972**
Option 1 ID : **4050367080**
Option 2 ID : **4050367078**
Option 3 ID : **4050367079**
Option 4 ID : **4050367081**
Status : **Answered**
Chosen Option : **3**

Q.12 A circle touches the y-axis at the point $(0, 4)$ and passes through the point $(2, 0)$. Which of the following lines is not a tangent to this circle ?

Options
1. $4x-3y+17=0$
2. $3x+4y-6=0$
3. $4x+3y-8=0$
4. $3x-4y-24=0$

Question Type : **MCQ**
Question ID : **4050361983**
Option 1 ID : **4050367125**
Option 2 ID : **4050367123**
Option 3 ID : **4050367124**
Option 4 ID : **4050367122**
Status : **Answered**
Chosen Option : **3**

Q.13 Let z be a complex number such that

$$\left|\frac{z-i}{z+2i}\right| = 1$$

and $|z| = \frac{5}{2}$. Then the value of $|z+3i|$ is :

Options
1. $\sqrt{10}$
2. $\frac{7}{2}$
3. $\frac{15}{4}$
4. $2\sqrt{3}$

Question Type : **MCQ**
Question ID : **4050361971**
Option 1 ID : **4050367077**
Option 2 ID : **4050367076**
Option 3 ID : **4050367074**
Option 4 ID : **4050367075**
Status : **Answered**
Chosen Option : **2**

Q.14

If $f'(x)=\tan^{-1}(\sec x+\tan x),\ -\frac{\pi}{2}<x<\frac{\pi}{2}$,

and $f(0)=0$, then $f(1)$ is equal to :

Options

1. $\frac{\pi+1}{4}$
2. $\frac{\pi+2}{4}$
3. $\frac{1}{4}$
4. $\frac{\pi-1}{4}$

Question Type : **MCQ**
Question ID : **4050361979**
Option 1 ID : **4050367108**
Option 2 ID : **4050367107**
Option 3 ID : **4050367109**
Option 4 ID : **4050367106**
Status : **Not Answered**
Chosen Option : **--**

Q.15

Negation of the statement :

'$\sqrt{5}$ is an integer or 5 is irrational' is :

Options

1. $\sqrt{5}$ is irrational or 5 is an integer.
2. $\sqrt{5}$ is not an integer or 5 is not irrational.
3. $\sqrt{5}$ is an integer and 5 is irrational.
4. $\sqrt{5}$ is not an integer and 5 is not irrational.

Question Type : **MCQ**
Question ID : **4050361988**
Option 1 ID : **4050367142**
Option 2 ID : **4050367143**
Option 3 ID : **4050367145**
Option 4 ID : **4050367144**
Status : **Answered**
Chosen Option : **4**

Q.16 If for all real triplets (a, b, c), $f(x)=a+bx+cx^2$; then $\int_0^1 f(x)dx$ is equal to :

Options

1. $2\left\{3f(1)+2f\left(\frac{1}{2}\right)\right\}$
2. $\frac{1}{3}\left\{f(0)+f\left(\frac{1}{2}\right)\right\}$
3. $\frac{1}{2}\left\{f(1)+3f\left(\frac{1}{2}\right)\right\}$
4. $\frac{1}{6}\left\{f(0)+f(1)+4f\left(\frac{1}{2}\right)\right\}$

Question Type : **MCQ**
Question ID : **4050361969**
Option 1 ID : **4050367068**
Option 2 ID : **4050367066**
Option 3 ID : **4050367067**
Option 4 ID : **4050367069**
Status : **Answered**
Chosen Option : **4**

Q.17 If the number of five digit numbers with distinct digits and 2 at the 10^{th} place is 336 k, then k is equal to :

Options

1. 8
2. 7
3. 4
4. 6

Question Type : **MCQ**
Question ID : **4050361974**
Option 1 ID : **4050367086**
Option 2 ID : **4050367087**
Option 3 ID : **4050367089**
Option 4 ID : **4050367088**
Status : **Answered**
Chosen Option : **1**

Q.18 Let the observations $x_i (1 \le i \le 10)$ satisfy the equations, $\sum_{i=1}^{10}(x_i - 5) = 10$ and $\sum_{i=1}^{10}(x_i - 5)^2 = 40$. If μ and λ are the mean and the variance of the observations, $x_1 - 3, x_2 - 3, ..., x_{10} - 3$, then the ordered pair (μ, λ) is equal to :

Options
1. $(6, 3)$
2. $(3, 6)$
3. $(3, 3)$
4. $(6, 6)$

Question Type : **MCQ**
Question ID : **4050361986**
Option 1 ID : **4050367136**
Option 2 ID : **4050367135**
Option 3 ID : **4050367137**
Option 4 ID : **4050367134**
Status : **Answered**
Chosen Option : **2**

Q.19 The integral $\int \frac{dx}{(x+4)^{8/7}(x-3)^{6/7}}$ is equal to :

(where C is a constant of integration)

Options
1. $-\left(\frac{x-3}{x+4}\right)^{-1/7} + C$
2. $\frac{1}{2}\left(\frac{x-3}{x+4}\right)^{3/7} + C$
3. $\left(\frac{x-3}{x+4}\right)^{1/7} + C$
4. $-\frac{1}{13}\left(\frac{x-3}{x+4}\right)^{-13/7} + C$

Question Type : **MCQ**
Question ID : **4050361980**
Option 1 ID : **4050367112**
Option 2 ID : **4050367110**
Option 3 ID : **4050367111**
Option 4 ID : **4050367113**
Status : **Answered**
Chosen Option : **3**

Q.20

In a box, there are 20 cards, out of which 10 are labelled as A and the remaining 10 are labelled as B. Cards are drawn at random, one after the other and with replacement, till a second A-card is obtained. The probability that the second A-card appears before the third B-card is :

Options

1. $\frac{15}{16}$
2. $\frac{9}{16}$
3. $\frac{13}{16}$
4. $\frac{11}{16}$

Question Type : **MCQ**
Question ID : **4050361985**
Option 1 ID : **4050367130**
Option 2 ID : **4050367133**
Option 3 ID : **4050367131**
Option 4 ID : **4050367132**
Status : **Not Answered**
Chosen Option : **--**

Q.21

If the vectors, $\vec{p} = (a+1)\hat{i} + a\hat{j} + a\hat{k}$, $\vec{q} = a\hat{i} + (a+1)\hat{j} + a\hat{k}$ and $\vec{r} = a\hat{i} + a\hat{j} + (a+1)\hat{k}$ $(a \in R)$ are coplanar and $3\left(\vec{p} \cdot \vec{q}\right)^2 - \lambda\left|\vec{r} \times \vec{q}\right|^2 = 0$, then the value of λ is _____.

Given Answer : **3**

Question Type : **SA**
Question ID : **4050361991**
Status : **Answered**

Q.22 The projection of the line segment joining the points $(1, -1, 3)$ and $(2, -4, 11)$ on the line joining the points $(-1, 2, 3)$ and $(3, -2, 10)$ is _____.

Given **4.44**
Answer :

Question Type : **SA**
Question ID : **4050361993**
Status : **Answered**

Q.23 The number of distinct solutions of the equation, $\log_{\frac{1}{2}}|\sin x| = 2 - \log_{\frac{1}{2}}|\cos x|$ in the interval $[0, 2\pi]$, is _____.

Given **2**
Answer :

Question Type : **SA**
Question ID : **4050361990**
Status : **Answered**

Q.24 If for $x \geq 0$, $y = y(x)$ is the solution of the differential equation,
$(x+1)dy = ((x+1)^2 + y - 3)dx$, $y(2) = 0$,
then $y(3)$ is equal to _____.

Given **2.17**
Answer :

Question Type : **SA**
Question ID : **4050361992**
Status : **Marked For Review**

Q.25 The coefficient of x^4 in the expansion of $(1 + x + x^2)^{10}$ is _____.

Given **615**
Answer :

Question Type : **SA**
Question ID : **4050361989**
Status : **Answered**