JEE MAIN
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# Session 2

# QUESTION PAPER

## 2023

JOINT ENTRANCE EXAMINATION - MAIN
PREVIOUS YEAR QUESTION PAPER

# JEE MAINS Session 2_6 to 12 April 2023

| | |
|---|---|
| Application No | |
| Candidate Name | |
| Roll No | |
| Test Date | |
| Test Time | |
| Subject | |

Section : **Mathematics Section A**

**Q.1**

Let two vertices of a triangle ABC be (2, 4, 6) and (0, –2, –5), and its centroid be (2, 1, –1). If the image of the third vertex in the plane $x+2y+4z=11$ is $(\alpha, \beta, \gamma)$, then $\alpha\beta+\beta\gamma+\gamma\alpha$ is equal to

**Options**

1. 76
2. 74
3. 72
4. 70

Question Type : **MCQ**
Question ID : **3666943123**
Option 1 ID : **3666949752**
Option 2 ID : **3666949751**
Option 3 ID : **3666949750**
Option 4 ID : **3666949749**
Status : **Not Answered**
Chosen Option : **--**

**Q.2**

$96\cos\frac{\pi}{33}\cos\frac{2\pi}{33}\cos\frac{4\pi}{33}\cos\frac{8\pi}{33}\cos\frac{16\pi}{33}$ is equal to

**Options**

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

Question Type : **MCQ**
Question ID : **3666943129**
Option 1 ID : **3666949776**
Option 2 ID : **3666949774**
Option 3 ID : **3666949775**
Option 4 ID : **3666949773**
Status : **Not Answered**
Chosen Option : **--**

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**Q.3**

Let the ellipse $E: x^2 + 9y^2 = 9$ intersect the positive $x$- and $y$-axes at the points A and B respectively. Let the major axis of $E$ be a diameter of the circle C. Let the line passing through A and B meet the circle C at the point P. If the area of the triangle with vertices A, P and the origin O is $\frac{m}{n}$, where $m$ and $n$ are coprime, then $m-n$ is equal to

**Options**

1. 18
2. 15
3. 16
4. 17

Question Type : **MCQ**
Question ID : **3666943121**
Option 1 ID : **3666949744**
Option 2 ID : **3666949741**
Option 3 ID : **3666949742**
Option 4 ID : **3666949743**
Status : **Not Answered**
Chosen Option : **--**

**Q.4**

The negation of the statement

$(p \vee q) \wedge (q \vee (\sim r))$ is

**Options**

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

Question Type : **MCQ**
Question ID : **3666943130**
Option 1 ID : **3666949780**
Option 2 ID : **3666949778**
Option 3 ID : **3666949777**
Option 4 ID : **3666949779**
Status : **Marked For Review**
Chosen Option : **2**

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**Q.5**

If the coefficient of $x^7$ in $\left(ax-\frac{1}{bx^2}\right)^{13}$ and the coefficient of $x^{-5}$ in $\left(ax+\frac{1}{bx^2}\right)^{13}$ are equal, then $a^4b^4$ is equal to:

**Options**

1. 11
2. 22
3. 44
4. 33

Question Type : **MCQ**
Question ID : **3666943115**
Option 1 ID : **3666949717**
Option 2 ID : **3666949718**
Option 3 ID : **3666949720**
Option 4 ID : **3666949719**
Status : **Answered**
Chosen Option : **2**

**Q.6**

An arc PQ of a circle subtends a right angle at its centre O. The mid point of the arc PQ is R. If $\overrightarrow{OP}=\vec{u}$, $\overrightarrow{OR}=\vec{v}$ and $\overrightarrow{OQ}=\alpha\vec{u}+\beta\vec{v}$, then $\alpha$, $\beta^2$ are the roots of the equation

**Options**

1. $x^2-x-2=0$
2. $3x^2+2x-1=0$
3. $x^2+x-2=0$
4. $3x^2-2x-1=0$

Question Type : **MCQ**
Question ID : **3666943127**
Option 1 ID : **3666949767**
Option 2 ID : **3666949766**
Option 3 ID : **3666949768**
Option 4 ID : **3666949765**
Status : **Not Answered**
Chosen Option : **--**

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**Q.7**

A square piece of tin of side 30 cm is to be made into a box without top by cutting a square from each corner and folding up the flaps to form a box. If the volume of the box is maximum, then its surface area (in $cm^2$) is equal to

**Options**

1. 800
2. 900
3. 675
4. 1025

Question Type : **MCQ**
Question ID : **3666943117**
Option 1 ID : **3666949728**
Option 2 ID : **3666949727**
Option 3 ID : **3666949725**
Option 4 ID : **3666949726**
Status : **Answered**
Chosen Option : **1**

**Q.8**

A line segment AB of length $\lambda$ moves such that the points A and B remain on the periphery of a circle of radius $\lambda$. Then the locus of the point, that divides the line segment AB in the ratio $2:3$, is a circle of radius

**Options**

1. $\frac{\sqrt{19}}{7}\lambda$
2. $\frac{\sqrt{19}}{5}\lambda$
3. $\frac{2}{3}\lambda$
4. $\frac{3}{5}\lambda$

Question Type : **MCQ**
Question ID : **3666943122**
Option 1 ID : **3666949745**
Option 2 ID : **3666949746**
Option 3 ID : **3666949747**
Option 4 ID : **3666949748**
Status : **Not Answered**
Chosen Option : **--**

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**Q.9**

If $I(x)=\int e^{\sin^2 x}(\cos x \sin 2x-\sin x)dx$ and $I(0)=1$, then $I\left(\frac{\pi}{3}\right)$ is equal to

**Options**

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

Question Type : **MCQ**
Question ID : **3666943118**
Option 1 ID : **3666949730**
Option 2 ID : **3666949732**
Option 3 ID : **3666949729**
Option 4 ID : **3666949731**
Status : **Not Answered**
Chosen Option : **--**

**Q.10**

Let P be the point of intersection of the line $\frac{x+3}{3}=\frac{y+2}{1}=\frac{1-z}{2}$ and the plane $x+y+z=2$. If the distance of the point P from the plane $3x-4y+12z=32$ is $q$, then $q$ and $2q$ are the roots of the equation

**Options**

1. $x^2+18x+72=0$
2. $x^2+18x-72=0$
3. $x^2-18x-72=0$
4. $x^2-18x+72=0$

Question Type : **MCQ**
Question ID : **3666943124**
Option 1 ID : **3666949753**
Option 2 ID : **3666949755**
Option 3 ID : **3666949754**
Option 4 ID : **3666949756**
Status : **Not Answered**
Chosen Option : **--**

**Q.11**

The slope of tangent at any point $(x, y)$ on a curve $y = y(x)$ is $\frac{x^2 + y^2}{2xy}$, $x > 0$.

If $y(2) = 0$, then a value of $y(8)$ is

**Options**

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

Question Type : **MCQ**
Question ID : **3666943120**
Option 1 ID : **3666949738**
Option 2 ID : **3666949740**
Option 3 ID : **3666949739**
Option 4 ID : **3666949737**
Status : **Answered**
Chosen Option : **1**

**Q.12**

Let the first term $a$ and the common ratio $r$ of a geometric progression be positive integers. If the sum of squares of its first three terms is 33033, then the sum of these three terms is equal to

**Options**

1. 241
2. 220
3. 231
4. 210

Question Type : **MCQ**
Question ID : **3666943116**
Option 1 ID : **3666949724**
Option 2 ID : **3666949722**
Option 3 ID : **3666949721**
Option 4 ID : **3666949723**
Status : **Not Answered**
Chosen Option : **--**

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**Q.13**

Let the complex number $z = x + iy$ be such that $\frac{2z-3i}{2z+i}$ is purely imaginary. If $x + y^2 = 0$, then $y^4 + y^2 - y$ is equal to:

**Options**

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

Question Type : **MCQ**
Question ID : **3666943112**
Option 1 ID : **3666949706**
Option 2 ID : **3666949708**
Option 3 ID : **3666949705**
Option 4 ID : **3666949707**
Status : **Not Answered**
Chosen Option : **--**

**Q.14**

If $f(x) = \frac{(\tan 1^\circ)x + \log_e(123)}{x\log_e(1234) - (\tan 1^\circ)}$, $x > 0$, then the least value of $f(f(x)) + f\left(f\left(\frac{4}{x}\right)\right)$ is

**Options**

1. $2$
2. $8$
3. $4$
4. $0$

Question Type : **MCQ**
Question ID : **3666943111**
Option 1 ID : **3666949702**
Option 2 ID : **3666949704**
Option 3 ID : **3666949703**
Option 4 ID : **3666949701**
Status : **Not Answered**
Chosen Option : **--**

**Q.15**

If $A$ is a $3\times3$ matrix and $|A|=2$, then $\left|3\ adj\left(|3A|A^2\right)\right|$ is equal to

**Options**

1. $3^{12}\cdot6^{11}$
2. $3^{12}\cdot6^{10}$
3. $3^{10}\cdot6^{11}$
4. $3^{11}\cdot6^{10}$

Question Type : **MCQ**
Question ID : **3666943114**
Option 1 ID : **3666949713**
Option 2 ID : **3666949714**
Option 3 ID : **3666949715**
Option 4 ID : **3666949716**
Status : **Answered**
Chosen Option : **2**

**Q.16**

Let $f$ be a differentiable function such that $x^2f(x)-x=4\int_0^x tf(t)dt$, $f(1)=\frac{2}{3}$. Then $18f(3)$ is equal to

**Options**

1. 180
2. 150
3. 160
4. 210

Question Type : **MCQ**
Question ID : **3666943119**
Option 1 ID : **3666949735**
Option 2 ID : **3666949733**
Option 3 ID : **3666949734**
Option 4 ID : **3666949736**
Status : **Answered**
Chosen Option : **3**

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**Q.17**

For the system of linear equations

$2x-y+3z=5$
$3x+2y-z=7$
$4x+5y+\alpha z=\beta$,

which of the following is NOT correct?

**Options**

1. The system is inconsistent for $\alpha=-5$ and $\beta=8$
2. The system has a unique solution for $\alpha\neq-5$ and $\beta=8$
3. The system has infinitely many solutions for $\alpha=-5$ and $\beta=9$
4. The system has infinitely many solutions for $\alpha=-6$ and $\beta=9$

Question Type : **MCQ**
Question ID : **3666943113**
Option 1 ID : **3666949709**
Option 2 ID : **3666949710**
Option 3 ID : **3666949711**
Option 4 ID : **3666949712**
Status : **Answered**
Chosen Option : **4**

**Q.18**

Let O be the origin and the position vector of the point P be $-\hat{i}-2\hat{j}+3\hat{k}$. If the position vectors of the points A, B and C are $-2\hat{i}+\hat{j}-3\hat{k}$, $2\hat{i}+4\hat{j}-2\hat{k}$ and $-4\hat{i}+2\hat{j}-\hat{k}$ respectively, then the projection of the vector $\overrightarrow{OP}$ on a vector perpendicular to the vectors $\overrightarrow{AB}$ and $\overrightarrow{AC}$ is

**Options**

1. $\frac{8}{3}$
2. $\frac{7}{3}$
3. $3$
4. $\frac{10}{3}$

Question Type : **MCQ**
Question ID : **3666943126**
Option 1 ID : **3666949762**
Option 2 ID : **3666949761**
Option 3 ID : **3666949763**
Option 4 ID : **3666949764**
Status : **Answered**
Chosen Option : **4**

**Q.19** The shortest distance between the lines $\frac{x+2}{1}=\frac{y}{-2}=\frac{z-5}{2}$ and $\frac{x-4}{1}=\frac{y-1}{2}=\frac{z+3}{0}$ is

**Options**

1. $7$
2. $9$
3. $8$
4. $6$

Question Type : **MCQ**
Question ID : **3666943125**
Option 1 ID : **3666949758**
Option 2 ID : **3666949760**
Option 3 ID : **3666949759**
Option 4 ID : **3666949757**
Status : **Answered**
Chosen Option : **2**

**Q.20** Let N denote the sum of the numbers obtained when two dice are rolled. If the probability that $2^N < N!$ is $\frac{m}{n}$, where $m$ and $n$ are coprime, then $4m-3n$ is equal to

**Options**

1. $12$
2. $8$
3. $6$
4. $10$

Question Type : **MCQ**
Question ID : **3666943128**
Option 1 ID : **3666949769**
Option 2 ID : **3666949771**
Option 3 ID : **3666949772**
Option 4 ID : **3666949770**
Status : **Not Answered**
Chosen Option : **--**

Section : **Mathematics Section B**

**Q.21** Let $y=p(x)$ be the parabola passing through the points (–1, 0), (0, 1) and (1, 0). If the area of the region $\left\{(x, y):(x+1)^2+(y-1)^2\le 1,\ y\le p(x)\right\}$ is A, then $12(\pi-4A)$ is equal to _____.

Given Answer : --

Question Type : **SA**
Question ID : **3666943138**
Status : **Not Answered**

**Q.22** The number of elements in the set $\{n \in \mathbb{Z} : |n^2 - 10n + 19| < 6\}$ is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943132**
Status : **Not Answered**

**Q.23** If the mean of the frequency distribution

| Class : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|
| Frequency : | 2 | 3 | $x$ | 5 | 4 |

is 28, then its variance is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943140**
Status : **Not Answered**

**Q.24** Let $f : (-2, 2) \to \mathbb{R}$ be defined by

$$f(x) = \begin{cases} x[x] & , -2 < x < 0 \\ (x-1)[x] & , 0 \le x < 2 \end{cases}$$

where $[x]$ denotes the greatest integer function. If $m$ and $n$ respectively are the number of points in (–2, 2) at which $y = |f(x)|$ is not continuous and not differentiable, then $m + n$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943137**
Status : **Not Answered**

**Q.25** The sum of all those terms, of the arithmetic progression 3, 8, 13, ..., 373, which are not divisible by 3, is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943136**
Status : **Not Answered**

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**Q.26**

The number of permutations, of the digits 1, 2, 3, ..., 7 without repetition, which neither contain the string 153 nor the string 2467, is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943133**
Status : **Not Answered**

**Q.27**

Some couples participated in a mixed doubles badminton tournament. If the number of matches played, so that no couple played in a match, is 840, then the total numbers of persons, who participated in the tournament, is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943134**
Status : **Not Answered**

**Q.28**

The coefficient of $x^7$ in $\left(1-x+2x^3\right)^{10}$ is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943135**
Status : **Not Answered**

**Q.29**

Let a, b, c be three distinct positive real numbers such that $(2a)^{\log_e a} = (bc)^{\log_e b}$ and $b^{\log_e 2} = a^{\log_e c}$.

Then $6a + 5bc$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943131**
Status : **Not Answered**

**Q.30**

Let a common tangent to the curves $y^2 = 4x$ and $(x-4)^2 + y^2 = 16$ touch the curves at the points P and Q. Then $(PQ)^2$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943139**
Status : **Not Answered**

Section : **Physics Section A**

**Q.31** Given below are two statements :

Statement I : Pressure in a reservoir of water is same at all points at the same level of water.

Statement II : The pressure applied to enclosed water is transmitted in all directions equally.

In the light of the above statements, choose the correct answer from the options given below :

**Options**

1. Statement I is true but Statement II is false
2. Both Statement I and Statement II are false
3. Statement I is false but Statement II is true
4. Both Statement I and Statement II are true

Question Type : **MCQ**
Question ID : **3666943146**
Option 1 ID : **3666949813**
Option 2 ID : **3666949812**
Option 3 ID : **3666949814**
Option 4 ID : **3666949811**
Status : **Answered**
Chosen Option : **4**

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**Q.32** Match List I with List II :

| List I | | List II | |
|---|---|---|---|
| (A) | 3 Translational degrees of freedom | (I) | Monoatomic gases |
| (B) | 3 Translational, 2 rotational degrees of freedoms | (II) | Polyatomic gases |
| (C) | 3 Translational, 2 rotational and 1 vibrational degrees of freedom | (III) | Rigid diatomic gases |
| (D) | 3 Translational, 3 rotational and more than one vibrational degrees of freedom | (IV) | Nonrigid diatomic gases |

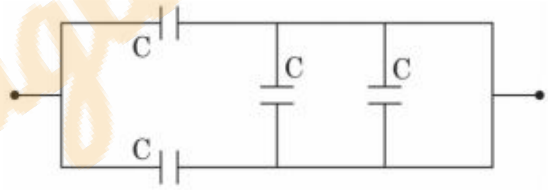
Choose the correct answer from the options given below :

**Options**

1. (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
2. (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
3. (A)-(I), (B)-(IV), (C)-(III), (D)-(II)
4. (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

Question Type : **MCQ**
Question ID : **3666943142**
Option 1 ID : **3666949797**
Option 2 ID : **3666949796**
Option 3 ID : **3666949795**
Option 4 ID : **3666949798**
Status : **Answered**
Chosen Option : **2**

**Q.33** The equivalent capacitance of the combination shown is




**Options**

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

Question Type : **MCQ**
Question ID : **3666943151**
Option 1 ID : **3666949833**
Option 2 ID : **3666949834**
Option 3 ID : **3666949831**
Option 4 ID : **3666949832**
Status : **Answered**
Chosen Option : **4**

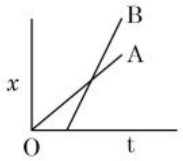
**Q.34** The angular momentum for the electron in Bohr's orbit is $L$. If the electron is assumed to revolve in second orbit of hydrogen atom, then the change in angular momentum will be

**Options**

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

Question Type : **MCQ**
Question ID : **3666943154**
Option 1 ID : **3666949846**
Option 2 ID : **3666949845**
Option 3 ID : **3666949844**
Option 4 ID : **3666949843**
Status : **Answered**
Chosen Option : **3**

**Q.35** The position-time graphs for two students A and B returning from the school to their homes are shown in figure.




(A) A lives closer to the school

(B) B lives closer to the school

(C) A takes lesser time to reach home

(D) A travels faster than B

(E) B travels faster than A

Choose the correct answer from the options given below:

**Options**

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

Question Type : **MCQ**
Question ID : **3666943148**
Option 1 ID : **3666949822**
Option 2 ID : **3666949821**
Option 3 ID : **3666949820**
Option 4 ID : **3666949819**
Status : **Answered**
Chosen Option : **3**

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**Q.36** An object is placed at a distance of 12 cm in front of a plane mirror. The virtual and erect image is formed by the mirror. Now the mirror is moved by 4 cm towards the stationary object. The distance by which the position of image would be shifted, will be

**Options**

1. 4 cm towards mirror
2. 8 cm away from mirror
3. 2 cm towards mirror
4. 8 cm towards mirror

Question Type : **MCQ**
Question ID : **3666943157**
Option 1 ID : **3666949856**
Option 2 ID : **3666949858**
Option 3 ID : **3666949855**
Option 4 ID : **3666949857**
Status : **Answered**
Chosen Option : **1**

**Q.37** The range of the projectile projected at an angle of 15° with horizontal is 50 m. If the projectile is projected with same velocity at an angle of 45° with horizontal, then its range will be

**Options**

1. 100 m
2. $100\sqrt{2}$ m
3. $50\sqrt{2}$ m
4. 50 m

Question Type : **MCQ**
Question ID : **3666943149**
Option 1 ID : **3666949825**
Option 2 ID : **3666949826**
Option 3 ID : **3666949824**
Option 4 ID : **3666949823**
Status : **Answered**
Chosen Option : **1**

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**Q.38** Given below are two statements :

Statement I : If the number of turns in the coil of a moving coil galvanometer is doubled then the current sensitivity becomes double.

Statement II : Increasing current sensitivity of a moving coil galvanometer by only increasing the number of turns in the coil will also increase its voltage sensitivity in the same ratio

In the light of the above statements, choose the correct answer from the options given below :

**Options**

1. Both Statement I and Statement II are false
2. Statement I is true but Statement II is false
3. Both Statement I and Statement II are true
4. Statement I is false but Statement II is true

Question Type : **MCQ**
Question ID : **3666943159**
Option 1 ID : **3666949864**
Option 2 ID : **3666949865**
Option 3 ID : **3666949863**
Option 4 ID : **3666949866**
Status : **Answered**
Chosen Option : **2**

**Q.39** A physical quantity P is given as

$$P = \frac{a^2 b^3}{c\sqrt{d}}$$

The percentage error in the measurement of $a$, $b$, $c$ and $d$ are 1%, 2%, 3% and 4% respectively. The percentage error in the measurement of quantity P will be

**Options**

1. 14%
2. 16%
3. 12%
4. 13%

Question Type : **MCQ**
Question ID : **3666943145**
Option 1 ID : **3666949808**
Option 2 ID : **3666949809**
Option 3 ID : **3666949807**
Option 4 ID : **3666949810**
Status : **Answered**
Chosen Option : **4**

**Q.40** A carrier wave of amplitude 15 V is modulated by a sinusoidal base band signal of amplitude 3 V. The ratio of maximum amplitude to minimum amplitude in an amplitude modulated wave is

**Options**

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

Question Type : **MCQ**
Question ID : **3666943152**
Option 1 ID : **3666949835**
Option 2 ID : **3666949836**
Option 3 ID : **3666949838**
Option 4 ID : **3666949837**
Status : **Answered**
Chosen Option : **3**

**Q.41** A particle executes S.H.M. of amplitude A along $x$-axis. At $t = 0$, the position of the particle is $x = \frac{A}{2}$ and it moves along positive $x$-axis. The displacement of particle in time $t$ is $x = A\sin(\omega t + \delta)$, then the value $\delta$ will be

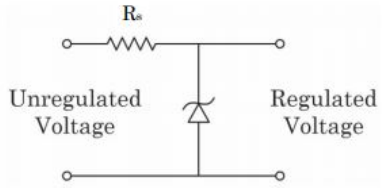
**Options**

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

Question Type : **MCQ**
Question ID : **3666943141**
Option 1 ID : **3666949793**
Option 2 ID : **3666949794**
Option 3 ID : **3666949792**
Option 4 ID : **3666949791**
Status : **Answered**
Chosen Option : **2**

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**Q.42** A zener diode of power rating 1.6 W is to be used as voltage regulator. If the zener diode has a breakdown of 8 V and it has to regulate voltage fluctuating between 3 V and 10 V. The value of resistance $R_s$ for safe operation of diode will be




**Options**

1. $12\ \Omega$
2. $13.3\ \Omega$
3. $13\ \Omega$
4. $10\ \Omega$

Question Type : **MCQ**
Question ID : **3666943153**
Option 1 ID : **3666949840**
Option 2 ID : **3666949842**
Option 3 ID : **3666949841**
Option 4 ID : **3666949839**
Status : **Not Answered**
Chosen Option : **--**

**Q.43** Consider two containers A and B containing monoatomic gases at the same Pressure (P), Volume (V) and Temperature (T). The gas in A is compressed isothermally to $\frac{1}{8}$ of its original volume while the gas in B is compressed adiabatically to $\frac{1}{8}$ of its original volume. The ratio of final pressure of gas in B to that of gas in A is

**Options**

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

Question Type : **MCQ**
Question ID : **3666943143**
Option 1 ID : **3666949799**
Option 2 ID : **3666949800**
Option 3 ID : **3666949802**
Option 4 ID : **3666949801**
Status : **Not Answered**
Chosen Option : **--**

**Q.44** A particle of mass $m$ moving with velocity $v$ collides with a stationary particle of mass 2m. After collision, they stick together and continue to move together with velocity

**Options**

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

Question Type : **MCQ**
Question ID : **3666943150**
Option 1 ID : **3666949829**
Option 2 ID : **3666949827**
Option 3 ID : **3666949828**
Option 4 ID : **3666949830**
Status : **Answered**
Chosen Option : **1**

**Q.45** Given below are two statements :

Statement I : Maximum power is dissipated in a circuit containing an inductor, a capacitor and a resistor connected in series with an AC source, when resonance occurs

Statement II : Maximum power is dissipated in a circuit containing pure resistor due to zero phase difference between current and voltage.

In the light of the above statements, choose the correct answer from the options given below :

**Options**

1. Both Statement I and Statement II are false
2. Statement I is false but Statement II is true
3. Both Statement I and Statement II are true
4. Statement I is true but Statement II is false

Question Type : **MCQ**
Question ID : **3666943155**
Option 1 ID : **3666949848**
Option 2 ID : **3666949850**
Option 3 ID : **3666949847**
Option 4 ID : **3666949849**
Status : **Answered**
Chosen Option : **3**

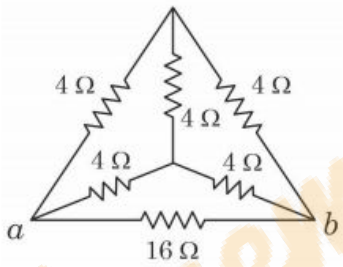
**Q.46** The energy of an electromagnetic wave contained in a small volume oscillates with

**Options**

1. the frequency of the wave
2. zero frequency
3. half the frequency of the wave
4. double the frequency of the wave

Question Type : **MCQ**
Question ID : **3666943158**
Option 1 ID : **3666949860**
Option 2 ID : **3666949859**
Option 3 ID : **3666949862**
Option 4 ID : **3666949861**
Status : **Answered**
Chosen Option : **4**

**Q.47** The equivalent resistance of the circuit shown below between points $a$ and $b$ is :




**Options**

1. $20\ \Omega$
2. $16\ \Omega$
3. $24\ \Omega$
4. $3.2\ \Omega$

Question Type : **MCQ**
Question ID : **3666943160**
Option 1 ID : **3666949868**
Option 2 ID : **3666949867**
Option 3 ID : **3666949869**
Option 4 ID : **3666949870**
Status : **Answered**
Chosen Option : **4**

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**Q.48** The de Broglie wavelength of a molecule in a gas at room temperature (300 K) is $\lambda_1$. If the temperature of the gas is increased to 600 K, then the de Broglie wavelength of the same gas molecule becomes

**Options**

1. $\frac{1}{\sqrt{2}}\lambda_1$
2. $2\lambda_1$
3. $\frac{1}{2}\lambda_1$
4. $\sqrt{2}\lambda_1$

Question Type : **MCQ**
Question ID : **3666943156**
Option 1 ID : **3666949853**
Option 2 ID : **3666949852**
Option 3 ID : **3666949851**
Option 4 ID : **3666949854**
Status : **Answered**
Chosen Option : **1**

**Q.49** Assuming the earth to be a sphere of uniform mass density, the weight of a body at a depth $d = \frac{R}{2}$ from the surface of earth, if its weight on the surface of earth is 200 N, will be :

(Given R = radius of earth)

**Options**

1. 300 N
2. 500 N
3. 400 N
4. 100 N

Question Type : **MCQ**
Question ID : **3666943147**
Option 1 ID : **3666949815**
Option 2 ID : **3666949816**
Option 3 ID : **3666949817**
Option 4 ID : **3666949818**
Status : **Answered**
Chosen Option : **4**

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**Q.50** Two satellites of masses $m$ and $3m$ revolve around the earth in circular orbits of radii $r$ & $3r$ respectively. The ratio of orbital speeds of the satellites respectively is

**Options**

1. $3:1$
2. $\sqrt{3}:1$
3. $9:1$
4. $1:1$

Question Type : **MCQ**
Question ID : **3666943144**
Option 1 ID : **3666949806**
Option 2 ID : **3666949804**
Option 3 ID : **3666949805**
Option 4 ID : **3666949803**
Status : **Not Answered**
Chosen Option : **--**

Section : **Physics Section B**

**Q.51** The current required to be passed through a solenoid of 15 cm length and 60 turns in order to demagnetise a bar magnet of magnetic intensity $2.4\times10^{3}\ Am^{-1}$ is _____ $A$.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943169**
Status : **Not Answered**

**Q.52** Three concentric spherical metallic shells $X$, $Y$ and $Z$ of radius $a$, $b$ and $c$ respectively $[a<b<c]$ have surface charge densities $\sigma, -\sigma$ and $\sigma$, respectively. The shells $X$ and $Z$ are at same potential. If the radii of $X$ & $Y$ are 2 cm and 3 cm, respectively. The radius of shell $Z$ is
_____ cm.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943165**
Status : **Not Answered**

**Q.53** 10 resistors each of resistance $10\,\Omega$ can be connected in such as to get maximum and minimum equivalent resistance. The ratio of maximum and minimum equivalent resistance will be _____.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943170**
Status : **Not Answered**

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**Q.54**

If the earth suddenly shrinks to $\frac{1}{64}$th of its original volume with its mass remaining the same, the period of rotation of earth becomes $\frac{24}{x}h$. The value of $x$ is _____

Given --
Answer :

Question Type : **SA**
Question ID : **3666943163**
Status : **Not Answered**

**Q.55**

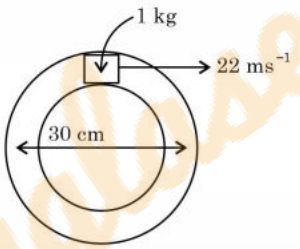
Unpolarised light of intensity $32\,Wm^{-2}$ passes through the combination of three polaroids such that the pass axis of the last polaroid is perpendicular to that of the pass axis of first polaroid. If intensity of emerging light is 3 $Wm^{-2}$, then the angle between pass axis of first two polaroids is _____ °.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943167**
Status : **Not Answered**

**Q.56**

A closed circular tube of average radius 15 cm, whose inner walls are rough, is kept in vertical plane. A block of mass 1 kg just fit inside the tube. The speed of block is 22 m/s, when it is introduced at the top of tube. After completing five oscillations, the block stops at the bottom region of tube. The work done by the tube on the block is _____ J. (Given $g = 10$ m/s$^2$).




Given --
Answer :

Question Type : **SA**
Question ID : **3666943164**
Status : **Not Answered**

**Q.57**

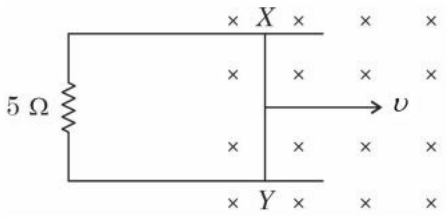
The decay constant for a radioactive nuclide is $1.5\times10^{-5}s^{-1}$. Atomic weight of the substance is 60 g mole$^{-1}$, ($N_A = 6\times10^{23}$). The activity of 1.0 μg of the substance is _____ $\times10^{10}$ Bq.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943166**
Status : **Not Answered**

**Q.58**

A 1 m long metal rod $XY$ completes the circuit as shown in figure. The plane of the circuit is perpendicular to the magnetic field of flux density 0.15 T. If the resistance of the circuit is $5\Omega$, the force needed to move the rod in direction, as indicated, with a constant speed of 4 m/s will be _____ $10^{-3}N$.




Given **18**
Answer :

Question Type : **SA**
Question ID : **3666943168**
Status : **Answered**

**Q.59**

A transverse harmonic wave on a string is given by

$$y(x, t) = 5 \sin(6t + 0.003x)$$

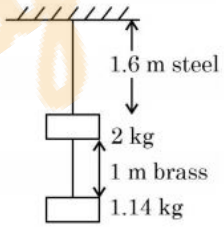
where $x$ and $y$ are in cm and $t$ in sec. The wave velocity is _____ $ms^{-1}$.

Given **20**
Answer :

Question Type : **SA**
Question ID : **3666943162**
Status : **Answered**

**Q.60**

Two wires each of radius 0.2 cm and negligible mass, one made of steel and the other made of brass are loaded as shown in the figure. The elongation of the steel wire is _____ $\times 10^{-6}m$. [Young's modulus for steel = $2\times10^{11}Nm^{-2}$ and $g = 10\ ms^{-2}$




Given **20**
Answer :

Question Type : **SA**
Question ID : **3666943161**
Status : **Answered**

Section : **Chemistry Section A**

**Q.61** The compound which does not exist is

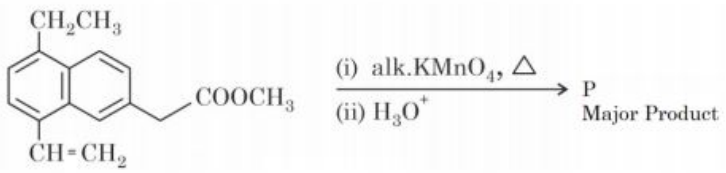
**Options**

1. $(NH_4)_2BeF_4$
2. $BeH_2$
3. $NaO_2$
4. $PbEt_4$

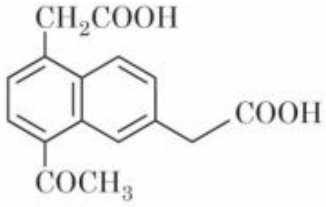
Question Type : **MCQ**
Question ID : **3666943177**
Option 1 ID : **3666949906**
Option 2 ID : **3666949908**
Option 3 ID : **3666949907**
Option 4 ID : **3666949905**
Status : **Answered**
Chosen Option : **1**

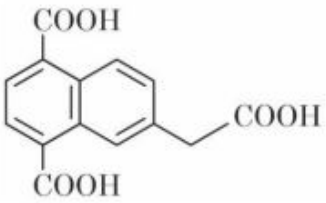
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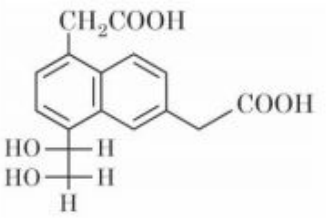
**Q.62** The major product 'P' formed in the given reaction is

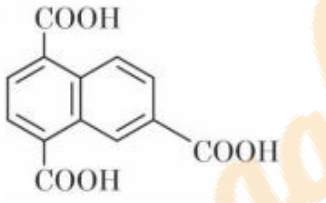



**Options**

1. 


2. 


3. 


4. 


Question Type : **MCQ**
Question ID : **3666943184**
Option 1 ID : **3666949935**
Option 2 ID : **3666949934**
Option 3 ID : **3666949933**
Option 4 ID : **3666949936**
Status : **Not Answered**
Chosen Option : **--**

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**Q.63** The one that does not stabilize 2° and 3° structures of proteins is

**Options**

1. H-bonding
2. van der Waals forces
3. – O – O – linkage
4. – S – S – linkage

Question Type : **MCQ**
Question ID : **3666943188**
Option 1 ID : **3666949949**
Option 2 ID : **3666949952**
Option 3 ID : **3666949950**
Option 4 ID : **3666949951**
Status : **Answered**
Chosen Option : **4**

**Q.64** Suitable reaction condition for preparation of Methyl phenyl ether is

**Options**

1. $PhO^{\ominus}Na^{\oplus}$, MeOH
2. Ph – Br, $MeO^{\ominus}Na^{\oplus}$
3. Benzene, MeBr
4. $PhO^{\ominus}Na^{\oplus}$, MeBr

Question Type : **MCQ**
Question ID : **3666943185**
Option 1 ID : **3666949938**
Option 2 ID : **3666949939**
Option 3 ID : **3666949940**
Option 4 ID : **3666949937**
Status : **Answered**
Chosen Option : **4**

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**Q.65**

Isomeric amines with molecular formula $C_8H_{11}N$ give the following tests

Isomer (P) $\Rightarrow$ Can be prepared by Gabriel phthalimide synthesis

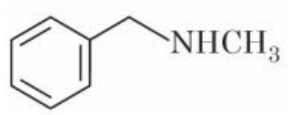
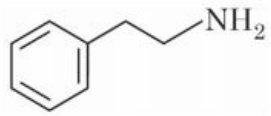
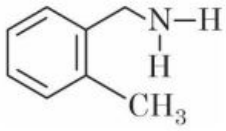
Isomer (Q) $\Rightarrow$ Reacts with Hinsberg's reagent to give solid insoluble in NaOH

Isomer (R) $\Rightarrow$ Reacts with HONO followed by $\beta$ – naphthol in NaOH to give red dye.

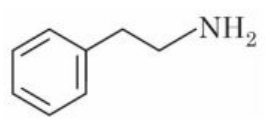
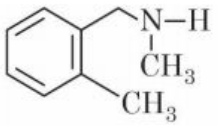
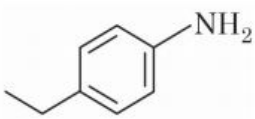
Isomers (P), (Q) and (R) respectively are

P Q R

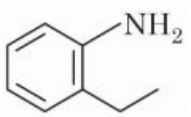
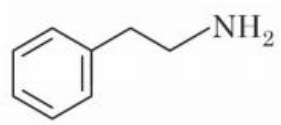
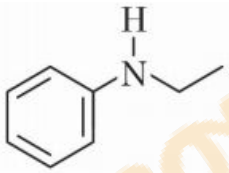
**Options** 1.

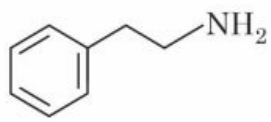
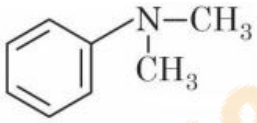
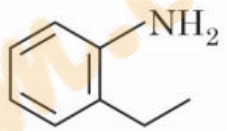
2.

3.

4.

Question Type : **MCQ**
Question ID : **3666943186**
Option 1 ID : **3666949941**
Option 2 ID : **3666949942**
Option 3 ID : **3666949943**
Option 4 ID : **3666949944**
Status : **Answered**
Chosen Option : **2**

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**Q.66** Which of the following is used as a stabilizer during the concentration of sulphide ores?

**Options**

1. Xanthates
2. Fatty acids
3. Pine oils
4. Cresols

Question Type : **MCQ**
Question ID : **3666943174**
Option 1 ID : **3666949893**
Option 2 ID : **3666949896**
Option 3 ID : **3666949894**
Option 4 ID : **3666949895**
Status : **Answered**
Chosen Option : **1**

**Q.67** Prolonged heating is avoided during the preparation of ferrous ammonium sulphate to

**Options**

1. prevent reduction
2. prevent breaking
3. prevent hydrolysis
4. prevent oxidation

Question Type : **MCQ**
Question ID : **3666943190**
Option 1 ID : **3666949959**
Option 2 ID : **3666949958**
Option 3 ID : **3666949957**
Option 4 ID : **3666949960**
Status : **Not Answered**
Chosen Option : **--**

**Q.68** The number of molecules and moles in 2.8375 litres of $O_2$ at STP are respectively

**Options**

1. $1.505 \times 10^{23}$ and 0.250 mol
2. $7.527 \times 10^{22}$ and 0.250 mol
3. $7.527 \times 10^{23}$ and 0.125 mol
4. $7.527 \times 10^{22}$ and 0.125 mol

Question Type : **MCQ**
Question ID : **3666943171**
Option 1 ID : **3666949881**
Option 2 ID : **3666949884**
Option 3 ID : **3666949882**
Option 4 ID : **3666949883**
Status : **Answered**
Chosen Option : **4**

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**Q.69**

Given

(A) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$ $\quad \Delta H_1^{\theta} = -x \text{ kJ mol}^{-1}$

(B) $C \text{ (graphite)} + O_2(g) \rightarrow CO_2(g)$ $\quad \Delta H_2^{\theta} = -y \text{ kJ mol}^{-1}$

The $\Delta H^{\theta}$ for the reaction

$C(\text{graphite}) + \frac{1}{2}O_2(g) \rightarrow CO(g)$ is

**Options**

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

Question Type : **MCQ**
Question ID : **3666943172**
Option 1 ID : **3666949887**
Option 2 ID : **3666949885**
Option 3 ID : **3666949888**
Option 4 ID : **3666949886**
Status : **Answered**
Chosen Option : **3**

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**Q.70**

Match List I with List II

| List I<br>Polymer | | List II<br>Type / Class | |
|---|---|---|---|
| (A) | Nylon-2-Nylon-6 | (I) | Thermosetting polymer |
| (B) | Buna-N | (II) | Biodegradable polymer |
| (C) | Urea-formaldehyde resin | (III) | Synthetic rubber |
| (D) | Dacron | (IV) | Polyester |

Choose the correct answer from the options given below:

**Options**

1. (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
2. (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
3. (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
4. (A)-(II), (B)-(I), (C)-(IV), (D)-(III)

Question Type : **MCQ**
Question ID : **3666943187**
Option 1 ID : **3666949948**
Option 2 ID : **3666949947**
Option 3 ID : **3666949946**
Option 4 ID : **3666949945**
Status : **Answered**
Chosen Option : **3**

**Q.71**

Match List I with List II

| List I<br>Industry | | List II<br>Waste Generated | |
|---|---|---|---|
| (A) | Steel plants | (I) | Gypsum |
| (B) | Thermal power plants | (II) | Fly ash |
| (C) | Fertilizer industries | (III) | Slag |
| (D) | Paper mills | (IV) | Bio-degradable wastes |

Choose the correct answer from the options given below:

**Options**

1. (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
2. (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
3. (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
4. (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Question Type : **MCQ**
Question ID : **3666943180**
Option 1 ID : **3666949917**
Option 2 ID : **3666949920**
Option 3 ID : **3666949919**
Option 4 ID : **3666949918**
Status : **Answered**
Chosen Option : **1**

**Q.72** Lime reacts exothermally with water to give 'A' which has low solubility in water. Aqueous solution of 'A' is often used for the test of $CO_2$, a test in which insoluble B is formed. If B is further reacted with $CO_2$ then soluble compound is formed. 'A' is

**Options**

1. Lime water
2. Slaked lime
3. Quick lime
4. White lime

Question Type : **MCQ**
Question ID : **3666943176**
Option 1 ID : **3666949902**
Option 2 ID : **3666949903**
Option 3 ID : **3666949901**
Option 4 ID : **3666949904**
Status : **Answered**
Chosen Option : **1**

**Q.73** The enthalpy change for the adsorption process and micelle formation respectively are

**Options**

1. $\Delta H_{ads} > 0$ and $\Delta H_{mic} < 0$
2. $\Delta H_{ads} < 0$ and $\Delta H_{mic} < 0$
3. $\Delta H_{ads} < 0$ and $\Delta H_{mic} > 0$
4. $\Delta H_{ads} > 0$ and $\Delta H_{mic} > 0$

Question Type : **MCQ**
Question ID : **3666943173**
Option 1 ID : **3666949891**
Option 2 ID : **3666949889**
Option 3 ID : **3666949892**
Option 4 ID : **3666949890**
Status : **Not Answered**
Chosen Option : **--**

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**Q.74** The pair from the following pairs having both compounds with net non-zero dipole moment is

**Options**

1. $CH_2Cl_2$, $CHCl_3$
2. 1,4-Dichlorobenzene, 1,3-Dichlorobenzene
3. cis-butene, trans-butene
4. Benzene, anisidine

Question Type : **MCQ**
Question ID : **3666943182**
Option 1 ID : **3666949926**
Option 2 ID : **3666949927**
Option 3 ID : **3666949925**
Option 4 ID : **3666949928**
Status : **Answered**
Chosen Option : **1**

**Q.75** Which of the following statements are correct?

(A) The $M^{3+}/M^{2+}$ reduction potential for iron is greater than manganese.
(B) The higher oxidation states of first row d-block elements get stabilized by oxide ion.
(C) Aqueous solution of $Cr^{2+}$ can liberate hydrogen from dilute acid.
(D) Magnetic moment of $V^{2+}$ is observed between 4.4 – 5.2 BM.

Choose the correct answer from the options given below:

**Options**

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

Question Type : **MCQ**
Question ID : **3666943178**
Option 1 ID : **3666949910**
Option 2 ID : **3666949912**
Option 3 ID : **3666949909**
Option 4 ID : **3666949911**
Status : **Answered**
Chosen Option : **1**

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**Q.76** Using column chromatography, mixture of two compounds 'A' and 'B' was separated. 'A' eluted first, this indicates 'B' has

**Options**

1. low $R_f$, stronger adsorption
2. high $R_f$, stronger adsorption
3. low $R_f$, weaker adsorption
4. high $R_f$, weaker adsorption

Question Type : **MCQ**
Question ID : **3666943181**
Option 1 ID : **3666949924**
Option 2 ID : **3666949922**
Option 3 ID : **3666949923**
Option 4 ID : **3666949921**
Status : **Not Answered**
Chosen Option : **--**

**Q.77** Given below are two reactions, involved in the commercial production of dihydrogen ($H_2$).
The two reactions are carried out at temperature "$T_1$" and "$T_2$", respectively

$$C(s) + H_2O(g) \xrightarrow{T_1} CO(g) + H_2(g)$$

$$CO(g) + H_2O(g) \xrightarrow[\text{Catalyst}]{T_2} CO_2(g) + H_2(g)$$

The temperatures $T_1$ and $T_2$ are correctly related as

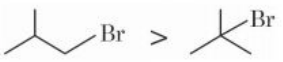
**Options**

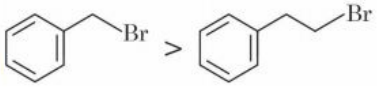
1. $T_1 > T_2$
2. $T_1 = T_2$
3. $T_1 = 100\ K,\ T_2 = 1270\ K$
4. $T_1 < T_2$

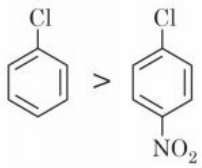
Question Type : **MCQ**
Question ID : **3666943175**
Option 1 ID : **3666949897**
Option 2 ID : **3666949899**
Option 3 ID : **3666949900**
Option 4 ID : **3666949898**
Status : **Answered**
Chosen Option : **4**

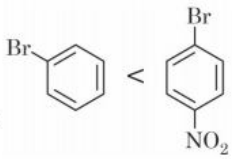
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**Q.78** Identify the correct order of reactivity for the following pairs towards the respective mechanism

(A) $S_N2$ 

(B) $S_N1$ 

(C) Electrophilic substitution 

(D) Nucleophilic substitution 

Choose the correct answer from the options given below:

**Options**

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

Question Type : **MCQ**
Question ID : **3666943183**
Option 1 ID : **3666949930**
Option 2 ID : **3666949932**
Option 3 ID : **3666949931**
Option 4 ID : **3666949929**
Status : **Answered**
Chosen Option : **1**

**Q.79** The octahedral diamagnetic low spin complex among the following is

**Options**

1. $[Co(NH_3)_6]^{3+}$
2. $[NiCl_4]^{2-}$
3. $[CoCl_6]^{3-}$
4. $[CoF_6]^{3-}$

Question Type : **MCQ**
Question ID : **3666943179**
Option 1 ID : **3666949915**
Option 2 ID : **3666949914**
Option 3 ID : **3666949916**
Option 4 ID : **3666949913**
Status : **Answered**
Chosen Option : **1**

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**Q.80** Given below are two statements:

Statement I : Aqueous solution of $K_2Cr_2O_7$ is preferred as a primary standard in volumetric analysis over $Na_2Cr_2O_7$ aqueous solution.

Statement II : $K_2Cr_2O_7$ has a higher solubility in water than $Na_2Cr_2O_7$.

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

**Options**

1. Statement I is false but Statement II is true
2. Statement I is true but Statement II is false
3. Both Statement I and Statement II are true
4. Both Statement I and Statement II are false

Question Type : **MCQ**
Question ID : **3666943189**
Option 1 ID : **3666949956**
Option 2 ID : **3666949955**
Option 3 ID : **3666949953**
Option 4 ID : **3666949954**
Status : **Not Answered**
Chosen Option : **--**

Section : **Chemistry Section B**

**Q.81** At constant temperature, a gas is at a pressure of 940.3 mm Hg. The pressure at which its volume decreases by 40% is ———— mm Hg. (Nearest integer)

Given Answer : **--**

Question Type : **SA**
Question ID : **3666943191**
Status : **Not Answered**

**Q.82** If the degree of dissociation of aqueous solution of weak monobasic acid is determined to be 0.3, then the observed freezing point will be ————% higher than the expected/theoretical freezing point. (Nearest integer)

Given Answer : **--**

Question Type : **SA**
Question ID : **3666943194**
Status : **Not Answered**

**Q.83**

The number of bent-shaped molecule/s from the following is _____

$N_3^-$, $NO_2^-$, $I_3^-$, $O_3$, $SO_2$

Given --
Answer :

Question Type : **SA**
Question ID : **3666943193**
Status : **Not Answered**

**Q.84**

$$FeO_4^{2-} \xrightarrow{+2.2V} Fe^{3+} \xrightarrow{+0.70V} Fe^{2+} \xrightarrow{-0.45V} Fe^{0}$$

$E^{\theta}_{FeO_4^{2-}/Fe^{2+}}$ is $x \times 10^{-3}$ V. The value of $x$ is _____

Given --
Answer :

Question Type : **SA**
Question ID : **3666943196**
Status : **Not Answered**

**Q.85**

In potassium ferrocyanide, there are ———— pairs of electrons in the $t_{2g}$ set of orbitals.

Given **5**
Answer :

Question Type : **SA**
Question ID : **3666943200**
Status : **Answered**

**Q.86**

In the following reactions, the total number of oxygen atoms in X and Y is _____

$Na_2O + H_2O \rightarrow 2X$

$Cl_2O_7 + H_2O \rightarrow 2Y$

Given **2**
Answer :

Question Type : **SA**
Question ID : **3666943198**
Status : **Answered**

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**Q.87** The number of incorrect statement/s about the black body from the following is _____

(A) Emit or absorb energy in the form of electromagnetic radiation.

(B) Frequency distribution of the emitted radiation depends on temperature.

(C) At a given temperature, intensity vs frequency curve passes through a maximum value.

(D) The maximum of the intensity vs frequency curve is at a higher frequency at higher temperature compared to that at lower temperature.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943192**
Status : **Not Answered**

**Q.88** The sum of lone pairs present on the central atom of the interhalogen $IF_5$ and $IF_7$ is _____

Given **1**
Answer :

Question Type : **SA**
Question ID : **3666943199**
Status : **Answered**

**Q.89** The number of correct statement/s involving equilibria in physical processes from the following is _____

(A) Equilibrium is possible only in a closed system at a given temperature.

(B) Both the opposing processes occur at the same rate.

(C) When equilibrium is attained at a given temperature, the value of all its parameters became equal.

(D) For dissolution of solids in liquids, the solubility is constant at a given temperature.

Given --
Answer :

Question Type : **SA**
Question ID : **3666943195**
Status : **Not Answered**

**Q.90** A molecule undergoes two independent first order reactions whose respective half lives are 12 min and 3 min. If both the reactions are occurring then the time taken for the 50% consumption of the reactant is ———— min. (Nearest integer)

Given **2**
Answer :

Question Type : **SA**
Question ID : **3666943197**
Status : **Answered**