National Testing Agency

Question Paper Name :	B Tech 27 Jun 2022 Shift 2
Subject Name :	B. Tech
Duration :	180
Total Marks :	300
Display Marks:	Yes

B. Tech

Group Number :	1
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300

Mathematics Section A

Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 1 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The number of points of intersection of

$$|z-(4+3i)|=2$$

and

$$|z|+|z-4|=6$$

, $z \in C$, is :

Options :

A. 0

B. 1

C. 2

D. 3

Question Number : 2 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If a_1, a_2, a_3 ..... and b_1, b_2, b_3 ..... are A.P., and $a_1 = 2$, $a_{10} = 3$, $a_1b_1 = 1 = a_{10}b_{10}$, then $a_4\, b_4$ is equal to -

Options :

A. $\frac{35}{27}$

B. 1

C. $\frac{27}{28}$

D. $\frac{28}{27}$

Question Number : 3 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If m and n respectively are the number of local maximum and local minimum points of the function

$$f(x) = \int_0^{x^2} \frac{t^2 - 5t + 4}{2 + e^t} dt$$

, then the ordered pair (m, n) is equal to

Options :

A. (3, 2)

B. (2, 3)

C. (2, 2)

D. (3, 4)

Question Number : 4 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let f be a differentiable function in

$$\left(0, \frac{\pi}{2}\right)$$

. If

$$\int_{\cos x}^{1} t^2 f(t)dt = \sin^3 x + \cos x$$

, then

$$\frac{1}{\sqrt{3}} f'\left(\frac{1}{\sqrt{3}}\right)$$

is equal to

Options :

A. $6 - 9\sqrt{2}$

B. $6 - \frac{9}{\sqrt{2}}$

C. $\frac{9}{2} - 6\sqrt{2}$

D. $\frac{9}{\sqrt{2}} - 6$

Question Number : 5 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The integral

$$\int_{0}^{1} \frac{1}{7^{\left[\frac{1}{x}\right]}} dx$$

, where [.] denotes the greatest integer function, is equal to

Options :

A. $1 + 6\log_e\left(\frac{6}{7}\right)$

B. $1 - 6\log_e\left(\frac{6}{7}\right)$

C. $\log_e\left(\frac{7}{6}\right)$

D. $1 - 7\log_e\left(\frac{6}{7}\right)$

Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If the solution curve of the differential equation

$$((\tan^{-1}y) - x)dy = (1 + y^2)dx$$

passes through the point (1, 0), then the abscissa of the point on the curve whose ordinate is tan(1), is

Options :

A. 2e

B. $\frac{2}{e}$

C. 2

D. $\frac{1}{e}$

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If the equation of the parabola, whose vertex is at (5, 4) and the directrix is $3x + y - 29 = 0$, is

$$x^2 + ay^2 + bxy + cx + dy + k = 0$$

, then $a + b + c + d + k$ is equal to :

Options :

A. 575

B. -575

C. 576

D. -576

Question Number : 8 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The set of values of k, for which the circle

$$C : 4x^2 + 4y^2 - 12x + 8y + k = 0$$

lies inside the fourth quadrant and the point

$$\left(1, -\frac{1}{3}\right)$$

lies on or inside the circle C, is :

Options :

A. an empty set

B. $\left(6, \frac{65}{9}\right]$

C. $\left[\frac{80}{9}, 10\right)$

D. $\left(9, \frac{92}{9}\right]$

Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The shortest distance between the lines

$$\frac{x-3}{2} = \frac{y-2}{3} = \frac{z-1}{-1}$$

and

$$\frac{x+3}{2} = \frac{y-6}{1} = \frac{z-5}{3}$$

, is :

Options :

A. $\frac{18}{\sqrt{5}}$

B. $\frac{22}{3\sqrt{5}}$

C. $\frac{46}{3\sqrt{5}}$

D. $6\sqrt{3}$

Question Number : 10 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let $\vec{a}$ and $\vec{b}$ be the vectors along the diagonals of a parallelogram having area $2\sqrt{2}$. Let the angle between $\vec{a}$ and $\vec{b}$ be acute,

$$|\vec{a}| = 1$$

, and

$$|\vec{a} \cdot \vec{b}| = |\vec{a} \times \vec{b}|$$

. If

$$\vec{c} = 2\sqrt{2}\left(\vec{a} \times \vec{b}\right) - 2\vec{b}$$

, then an angle between $\vec{b}$ and $\vec{c}$ is :

Options :

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

B. $-\frac{\pi}{4}$

C. $\frac{5\pi}{6}$

D. $\frac{3\pi}{4}$

Question Number : 11 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The mean and variance of the data 4, 5, 6, 6, 7, 8, x, y, where x < y, are 6 and $\frac{9}{4}$ respectively. Then $x^4 + y^2$ is equal to :

Options :

A. 162

B. 320

C. 674

D. 420

Question Number : 12 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If a point A(x, y) lies in the region bounded by the y-axis, straight lines 2y + x = 6 and 5x − 6y = 30, then the probability that y < 1 is :

Options :

A. $\frac{1}{6}$

B. $\frac{5}{6}$

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

D. $\frac{6}{7}$

Question Number : 13 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The value of

$$\cot\left(\sum_{n=1}^{50}\tan^{-1}\left(\frac{1}{1+n+n^2}\right)\right)$$

is :

Options :

A. $\frac{26}{25}$

B. $\frac{25}{26}$

C. $\frac{50}{51}$

D. $\frac{52}{51}$

Question Number : 14 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

$$\alpha = \sin 36^\circ$$

is a root of which of the following equation?

Options :

A. $16x^4 - 10x^2 - 5 = 0$

B. $16x^4 + 20x^2 - 5 = 0$

C. $16x^4 - 20x^2 + 5 = 0$

D. $4x^4 - 10x^2 + 5 = 0$

Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let

$$f(x) = \begin{vmatrix} a & -1 & 0 \\ ax & a & -1 \\ ax^2 & ax & a \end{vmatrix}, a \in R$$

. Then the sum of the squares of all the values of a, for which

$$2f'(10) - f'(5) + 100 = 0$$

, is

Options :

A. 117

B. 106

C. 125

D. 136

Question Number : 16 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let for some real numbers α and β, $a = \alpha - i\beta$. If the system of equations

$$4ix + (1+i)y = 0$$

and

$$8\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)x + ay = 0$$

has more than one solution, then $\frac{\alpha}{\beta}$ is equal to

Options :

A. $-2\sqrt{3}$

B. $2 - \sqrt{3}$

C. $2 + \sqrt{3}$

D. $-2 - \sqrt{3}$

Question Number : 17 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let A and B be two 3×3 matrices such that $AB = I$ and

$$|A| = \frac{1}{8}$$

. Then $|adj\,(B\,adj(2A))|$ is equal to

Options :

A. 16

B. 32

C. 64

D. 128

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let

$$S = 2 + \frac{6}{7} + \frac{12}{7^2} + \frac{20}{7^3} + \frac{30}{7^4} + \ldots..$$

. Then 4S is equal to

Options :

A. $\left(\frac{7}{3}\right)^2$

B. $\frac{7^3}{3^2}$

C. $\left(\frac{7}{3}\right)^3$

D. $\frac{7^2}{3^3}$

Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let the foot of the perpendicular from the point (1, 2, 4) on the line

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

be P. Then the distance of P from the plane

$$3x + 4y + 12z + 23 = 0$$

is :

Options :

A. 5

B. $\frac{50}{13}$

C. 4

D. $\frac{63}{13}$

Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Which of the following statement is a tautology?

Options :

A. $((\sim q) \wedge p) \wedge q$

B. $((\sim q) \wedge p) \wedge (p \wedge (\sim p))$

C. $((\sim q) \wedge p) \vee (p \vee (\sim p))$

D. $(p \wedge q) \wedge (\sim p \wedge q))$

Mathematics Section B

Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 21 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let S = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}. Define f : S → S as

$$f(n) = \begin{cases} 2n & , \quad if\ n = 1,2,3,4,5 \\ 2n - 11 & , \quad if\ n = 6,7,8,9,10 \end{cases}$$

.

Let g : S → S be a function such that

$$fog(n) = \begin{cases} n+1 & , \quad if\ n\ is\ odd \\ n-1 & , \quad if\ n\ is\ even \end{cases}$$

.

Then $g(10)g(1) + g(2) + g(3) + g(4) + g(5))$ is equal to _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 22 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let α, β be the roots of the equation

$$x^2 - 4\lambda x + 5 = 0$$

and α, γ be the roots of the equation

$$x^2 - \left(3\sqrt{2} + 2\sqrt{3}\right)x + 7 + 3\lambda\sqrt{3} = 0$$

, $\lambda > 0$. If

$$\beta + \gamma = 3\sqrt{2}$$

, then $(\alpha + 2\beta + \gamma)^2$ is equal to _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 23 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let A be a matrix of order 2 × 2, whose entries are from the set {0, 1, 2, 3, 4, 5}. If the sum of all the entries of A is a prime number p, 2 < p < 8, then the number of such matrices A is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 24 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let [t] denote the greatest integer $\leq$ t and {t} denote the fractional part of t. The integral value of α for which the left hand limit of the function

$$f(x) = [1 + x] + \frac{\alpha^{2[x] + \{x\}} + [x] - 1}{2[x] + \{x\}}$$

at x = 0 is equal to

$$\alpha - \frac{4}{3}$$

, is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 25 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

If

$$y(x) = (x^x)^x,\ x > 0$$

, then

$$\frac{d^2x}{dy^2} + 20$$

at x = 1 is equal to _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 26 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

If the area of the region

$$\left\{(x, y) : x^{\frac{2}{3}} + y^{\frac{2}{3}} \leq 1,\ x + y \geq 0,\ y \geq 0\right\}$$

is A, then $\frac{256A}{\pi}$ is equal to _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 27 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let

$$y = y(x)$$

be the solution of the differential equation

$$(1-x^2)dy = \left(xy + (x^3+2)\sqrt{1-x^2}\ \right)dx, -1 < x < 1$$

, and

$$y(0) = 0$$

. If

$$\int_{\frac{-1}{2}}^{\frac{1}{2}} \sqrt{1-x^2}\ y(x)dx = k$$

, then k^{-1} is equal to _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 28 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let S = $\{E_1, E_2, ..., E_8\}$ be a sample space of a random experiment such that

$$P(E_n) = \frac{n}{36}$$

for every n = 1, 2, ..., 8. Then the number of elements in the set

$$\left\{A \subseteq S : P(A) \geq \frac{4}{5}\right\}$$

is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 29 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

If the sum of the coefficients of all the positive powers of x, in the Binomial expansion of

$$\left(x^n + \frac{2}{x^5}\right)^7$$

is 939, then the sum of all the possible integral values of n is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 30 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Let a circle C of radius 5 lie below the x-axis. The line $L_1 : 4x + 3y + 2 = 0$ passes through the centre P of the circle C and intersects the line $L_2 = 3x - 4y - 11 = 0$ at Q. The line L_2 touches C at the point Q. Then the distance of P from the line $5x - 12y + 51 = 0$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Physics Section A

Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The SI unit of a physical quantity is pascal-second. The dimensional formula of this quantity will be :

Options :

A. $[ML^{-1}T^{-1}]$

B. $[ML^{-1}T^{-2}]$

C. $[ML^{2}T^{-1}]$

D. $[M^{-1}L^{3}T^{0}]$

Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The distance of the Sun from earth is 1.5×10^{11} m and its angular diameter is (2000) s when observed from the earth. The diameter of the Sun will be :

Options :

A. 2.45×10^{10} m

B. 1.45×10^{10} m

C. 1.45×10^{9} m

D. 0.14×10^{9} m

Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

When a ball is dropped into a lake from a height 4.9 m above the water level, it hits the water with a velocity v and then sinks to the bottom with the constant velocity v. It reaches the bottom of the lake 4.0 s after it is dropped. The approximate depth of the lake is :

Options :

A. 19.6 m

B. 29.4 m

C. 39.2 m

D. 73.5 m

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

One end of a massless spring of spring constant k and natural length l_0 is fixed while the other end is connected to a small object of mass m lying on a frictionless table. The spring remains horizontal on the table. If the object is made to rotate at an angular velocity ω about an axis passing through fixed end, then the elongation of the spring will be :

Options :

A. $\frac{k - m\omega^2 l_0}{m\omega^2}$

B. $\frac{m\omega^2 l_0}{k + m\omega^2}$

C. $\frac{m\omega^2 l_0}{k - m\omega^2}$

D. $\frac{k + m\omega^2 l_0}{m\omega^2}$

Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A stone tide to a spring of length L is whirled in a vertical circle with the other end of the spring at the centre. At a certain instant of time, the stone is at its lowest position and has a speed u. The magnitude of change in its velocity, as it reaches a position where the string is horizontal, is $\sqrt{x(u^2 - gL)}$. The value of x is -

Options :

A. 3

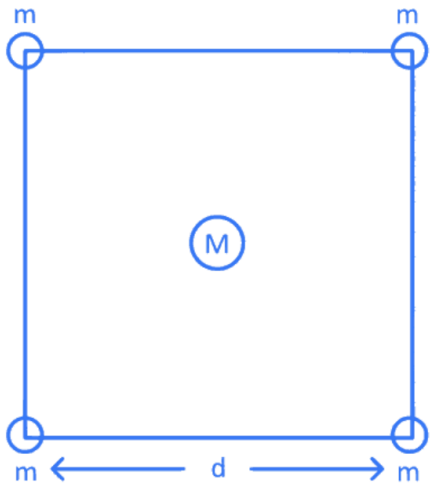
B. 2

C. 1

D. 5

Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Four spheres each of mass m from a square of side d (as shown in figure). A fifth sphere of mass M is situated at the centre of square. The total gravitational potential energy of the system is :



Options :

A. $-\frac{Gm}{d}\left[(4+\sqrt{2}\ )m+4\sqrt{2}\ M\right]$

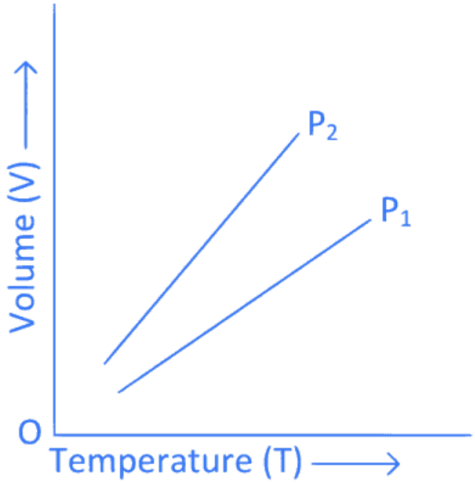
B. $-\frac{Gm}{d}\left[(4+\sqrt{2}\ )M+4\sqrt{2}\ m\right]$

C. $-\frac{Gm}{d}\left[3m^2+4\sqrt{2}\ M\right]$

D. $-\frac{Gm}{d}\left[6m^2+4\sqrt{2}\ M\right]$

Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

For a perfect gas, two pressures P_1 and P_2 are shown in figure. The graph shows :



Options :

A. $P_1 > P_2$

B. $P_1 < P_2$

C. $P_1 = P_2$

D. Insufficient data to draw any conclusion

Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

According to kinetic theory of gases,

A. The motion of the gas molecules freezes at 0°C.

B. The mean free path of gas molecules decreases if the density of molecules is increased.

C. The mean free path of gas molecules increases if temperature is increased keeping pressure constant.

D. Average kinetic energy per molecule per degree of freedom is $\frac{3}{2}k_BT$ (for monoatomic gases).

Choose the most appropriate answer from the options given below :

Options :

A. A and C only

B. B and C only

C. A and B only

D. C and D only

Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A lead bullet penetrates into a solid object and melts. Assuming that 40% of its kinetic energy is used to heat it, the initial speed of bullet is :

(Given : initial temperature of the bullet = 127°C, Melting point of the bullet = 327°C, Latent heat of fusion of lead = 2.5×10^4 J kg^{-1}, Specific heat capacity of lead = 125 J/kg K)

Options :

A. $125\ ms^{-1}$

B. $500\ ms^{-1}$

C. $250\ ms^{-1}$

D. $600\ ms^{-1}$

Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The equation of a particle executing simple harmonic motion is given by

$$x = \sin \pi\left(t + \frac{1}{3}\right)m$$

. At t = 1s, the speed of particle will be

(Given :

$$\pi$$

= 3.14)

Options :

A. $0\ cm\ s^{-1}$

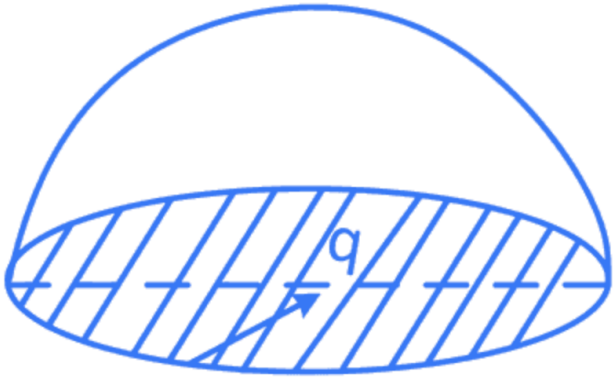
B. $157\ cm\ s^{-1}$

C. $272\ cm\ s^{-1}$

D. $314\ cm\ s^{-1}$

Question Number : 41 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If a charge q is placed at the centre of a closed hemispherical non-conducting surface, the total flux passing through the flat surface would be :



Options :

A. $\frac{q}{\epsilon_0}$

B. $\frac{q}{2\,\epsilon_0}$

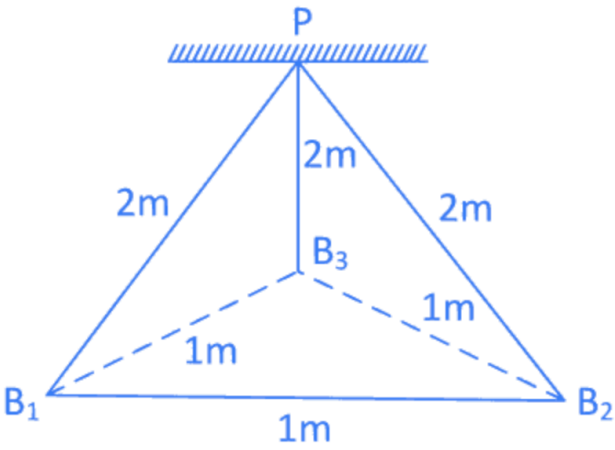
C. $\frac{q}{4\,\epsilon_0}$

D. $\frac{q}{2\pi\,\epsilon_0}$

Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Three identical charged balls each of charge 2 C are suspended from a common point P by silk threads of 2 m each (as shown in figure). They form an equilateral triangle of side 1m.

The ratio of net force on a charged ball to the force between any two charged balls will be :



Options :

A. 1 : 1

B. $1:4$

C. $\sqrt{3}:2$

D. $\sqrt{3}:1$

Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

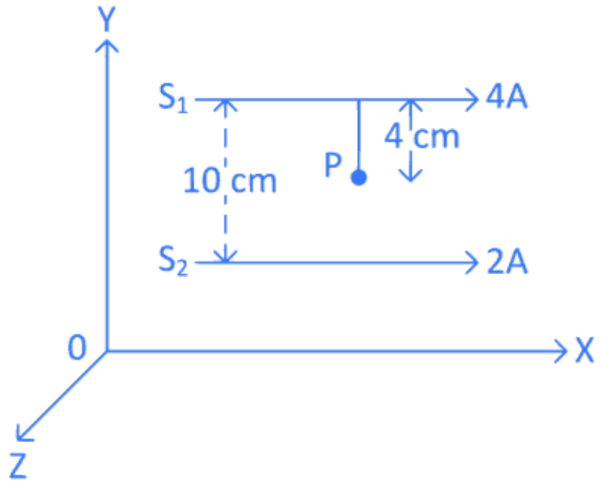
Two long parallel conductors S_1 and S_2 are separated by a distance 10 cm and carrying currents of 4A and 2A respectively. The conductors are placed along x-axis in X-Y plane. There is a point P located between the conductors (as shown in figure).

A charge particle of 3π coulomb is passing through the point P with velocity

$$\vec{v} = (2\hat{i} + 3\hat{j})$$

m/s; where $\hat{i}$ and $\hat{j}$ represents unit vector along x & y axis respectively.

The force acting on the charge particle is $4\pi \times 10^{-5}(-x\hat{i} + 2\hat{j})$ N. The value of x is :



Options :

A. 2

B. 1

C. 3

D. -3

Question Number : 44 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If L, C and R are the self inductance, capacitance and resistance respectively, which of the following does not have the dimension of time?

Options :

A. RC

B. $\frac{L}{R}$

C. $\sqrt{LC}$

D. $\frac{L}{C}$

Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Given below are two statements :

Statement I : A time varying electric field is a source of changing magnetic field and vice-versa. Thus a disturbance in electric or magnetic field creates EM waves.

Statement II : In a material medium, the EM wave travels with speed

$$v = \frac{1}{\sqrt{\mu_0 \in_0}}$$

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

Options :

A. Both Statement I and Statement II are true

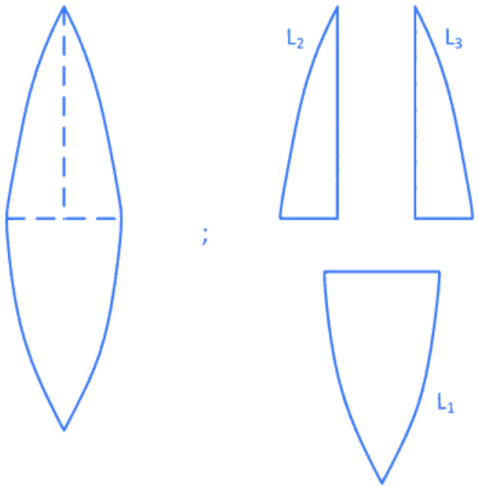
B. Both Statement I and Statement II are false

C. Statement I is correct but Statement II is false

D. Statement I is incorrect but Statement II is true

Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A convex lens has power P. It is cut into two halves along its principal axis. Further one piece (out of the two halves) is cut into two halves perpendicular to the principal axis (as shown in figures). Choose the incorrect option for the reported pieces.



Options :

A. Power of $L_1 = \frac{P}{2}$

B. Power of $L_2 = \frac{P}{2}$

C. Power of $L_3 = \frac{P}{2}$

D. Power of $L_1 = P$

Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If a wave gets refracted into a denser medium, then which of the following is true?

Options :

A. wavelength, speed and frequency decreases.

B. wavelength increases, sped decreases and frequency remains constant.

C. wavelength and speed decreases but frequency remains constant.

D. wavelength, speed and frequency increases.

Question Number : 48 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Given below are two statements :

Statement I : In hydrogen atom, the frequency of radiation emitted when an electron jumps from lower energy orbit (E_1) to higher energy orbit (E_2), is given as $hf = E_1 - E_2$

Statement II : The jumping of electron from higher energy orbit (E_2) to lower energy orbit (E_1) is associated with frequency of radiation given as $f = (E_2 - E_1)/h$

This condition is Bohr's frequency condition.

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

Options :

A. Both Statement I and Statement II are true.

B. Both Statement I and Statement II are false.

C. Statement I is correct but Statement II is false.

D. Statement I is incorrect but Statement II is true.

Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

For a transistor to act as a switch, it must be operated in

Options :

A. Active region.

B. Saturation state only.

C. Cut-off state only.

D. Saturation and cut-off state.

Question Number : 50 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

We do not transmit low frequency signal to long distances because-

(a) The size of the antenna should be comparable to signal wavelength which is unreal solution for a signal of longer wavelength.

(b) Effective power radiated by a long wavelength baseband signal would be high.

(c) We want to avoid mixing up signals transmitted by different transmitter simultaneously.

(d) Low frequency signal can be sent to long distances by superimposing with a high frequency wave as well.

Therefore, the most suitable option will be :

Options :

A. All statements are true

B. (a), (b) and (c) are true only

C. (a), (c) and (d) are true only

D. (b), (c) and (d) are true only

Physics Section B

Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 51 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A mass of 10 kg is suspended vertically by a rope of length 5 m from the roof. A force of 30 N is applied at the middle point of rope in horizontal direction. The angle made by upper half of the rope with vertical is $\theta = \tan^{-1}(x \times 10^{-1})$. The value of x is _____.

(Given, g = 10 m/s^2)

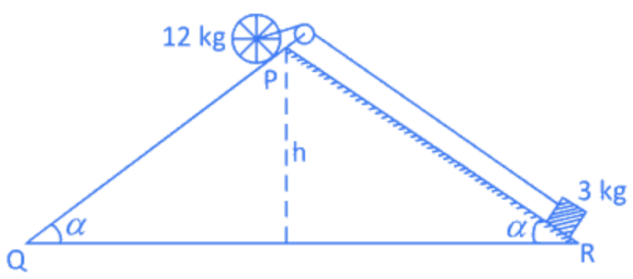
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 52 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A rolling wheel of 12 kg is on an inclined plane at position P and connected to a mass of 3 kg through a string of fixed length and pulley as shown in figure. Consider PR as friction free surface. The velocity of centre of mass of the wheel when it reaches at the bottom Q of the inclined plane PQ will be

$$\frac{1}{2}\sqrt{xgh}$$

m/s. The value of x is _____.



Response Type : Numeric

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 53 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A diatomic gas ($\gamma = 1.4$) does 400J of work when it is expanded isobarically. The heat given to the gas in the process is _____ J.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 54 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A particle executes simple harmonic motion. Its amplitude is 8 cm and time period is 6 s. The time it will take to travel from its position of maximum displacement to the point corresponding to half of its amplitude, is _____ s.

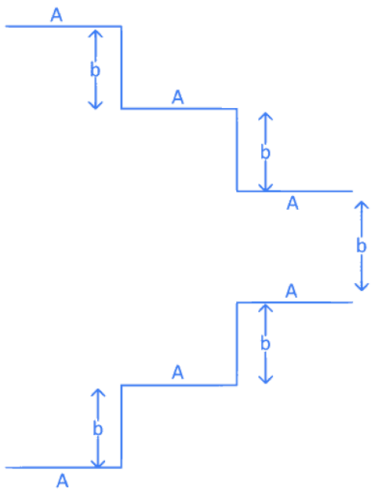
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 55 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A parallel plate capacitor is made up of stair like structure with a plate area A of each stair and that is connected with a wire of length b, as shown in the figure. The capacitance of the arrangement is

$$\frac{x}{15}\frac{\epsilon_0 A}{b}$$

. The value of x is _____.



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 56 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

The current density in a cylindrical wire of radius r = 4.0 mm is 1.0×10^6 A/m^2. The current through the outer portion of the wire between radial distances $\frac{r}{2}$ and r is xπ A; where x is _____.

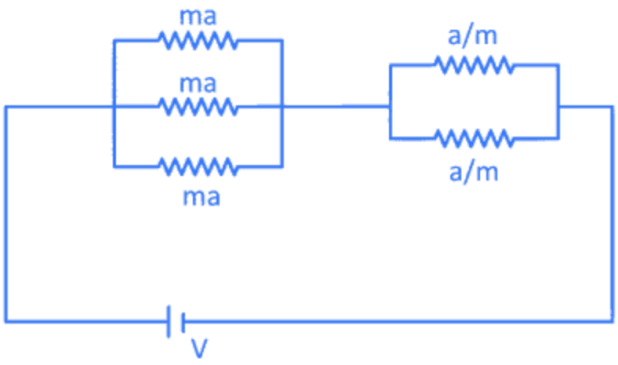
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 57 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

In the given circuit 'a' is an arbitrary constant. The value of m for which the equivalent circuit resistance is minimum, will be

$$\sqrt{\frac{x}{2}}$$

. The value of x is _____.



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 58 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A deuteron and a proton moving with equal kinetic energy enter into a uniform magnetic field at right angle to the field. If r_d and r_p are the radii of their circular paths respectively, then the ratio $\frac{r_d}{r_p}$ will be $\sqrt{x}$: 1 where x is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

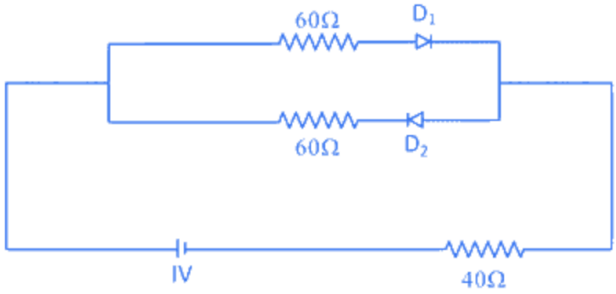
Question Number : 59 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A metallic rod of length 20 cm is placed in North-South direction and is moved at a constant speed of 20 m/s towards East. The horizontal component of the Earth's magnetic field at that place is 4×10^{-3} T and the angle of dip is 45°. The emf induced in the rod is _____ mV.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 60 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

The cut-off voltage of the diodes (shown in figure) in forward bias is 0.6 V. The current through the resister of 40 Ω is _____ mA.



Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Chemistry Section A

Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 61 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Identify the incorrect statement for PCl_5 from the following.

Options :

A. In this molecule, orbitals of phosphorous are assumed to undergo sp^3d hybridization.

B. The geometry of PCl_5 is trigonal bipyramidal.

C. PCl_5 has two axial bonds stronger than three equatorial bonds.

D. The three equatorial bonds of PCl_5 lie in a plane.

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The correct order of increasing intermolecular hydrogen bond strength is :

Options :

A. $HCN < H_2O < NH_3$

B. $HCN < CH_4 < NH_3$

C. $CH_4 < HCN < NH_3$

D. $CH_4 < NH_3 < HCN$

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The correct order of increasing ionic radii is

Options :

A. $Mg^{2+} < Na^{+} < F^{-} < O^{2-} < N^{3-}$

B. $N^{3-} < O^{2-} < F^{-} < Na^{+} < Mg^{2+}$

C. $F^{-} < Na^{+} < O^{2-} < Mg^{2+} < N^{3-}$

D. $Na^{+} < F^{-} < Mg^{2+} < O^{2-} < N^{3-}$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Fluorine forms one oxoacid.

Reason R : Fluorine has smallest size amongst all halogens and is highly electronegative.

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

Options :

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is NOT the correct explanation of A.

C. A is correct but R is not correct.

D. A is not correct but R is correct.

Question Number : 65 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In 3d series, the metal having the highest M^{2+}/M standard electrode potential is :

Options :

A. Cr

B. Fe

C. Cu

D. Zn

Question Number : 66 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The 'f' orbitals are half and completely filled, respectively in lanthanide ions :

[Given : Atomic no. Eu, 63; Sm, 62; Tm, 69; Tb, 65; Yb, 70; Dy, 66]

Options :

A. Eu^{2+} and Tm^{2+}

B. Sm^{2+} and Tm^{3+}

C. Tb^{4+} and Yb^{2+}

D. Dy^{3+} and Yb^{3+}

Question Number : 67 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Arrange the following coordination compounds in the increasing order of magnetic moments. (Atomic numbers : Mn = 25; Fe = 26)

A. $[FeF_6]^{3-}$

B. $[Fe(CN)_6]^{3-}$

C. $[MnCl_6]^{3-}$ (high spin)

D. $[Mn(CN)_6]^{3-}$

Choose the correct answer from the options given below :

Options :

A. A < B < D < C

B. B < D < C < A

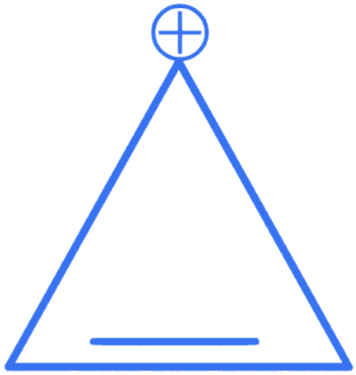
C. A < C < D < B

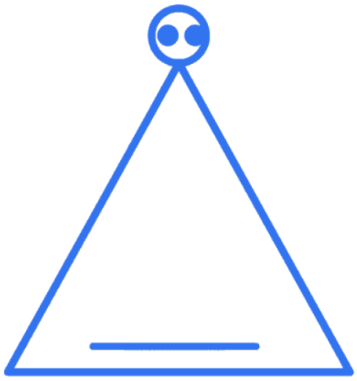
D. B < D < A < C

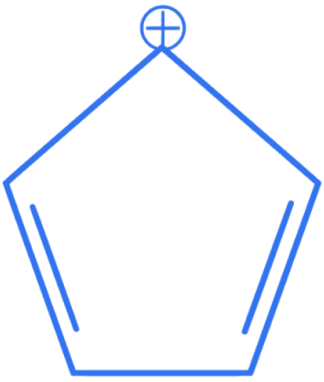
Question Number : 68 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

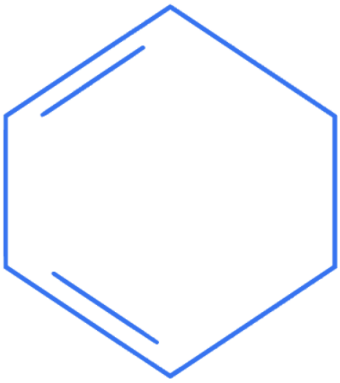
Which of the following is most stable?

Options :

A. 

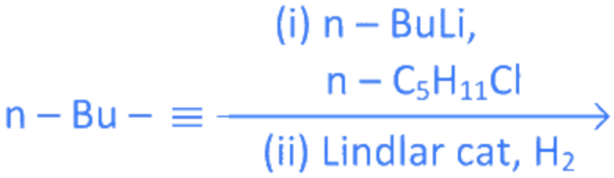
B. 

C. 

D. 

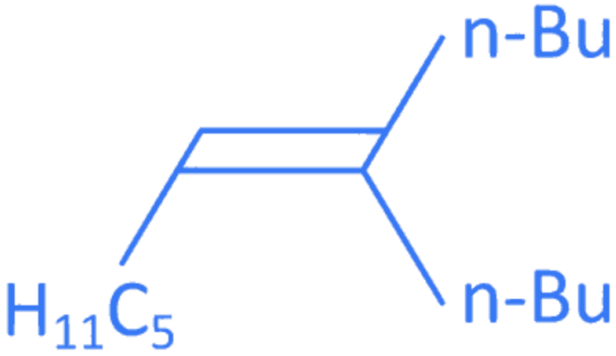
Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

What will be the major product of following sequence of reactions?

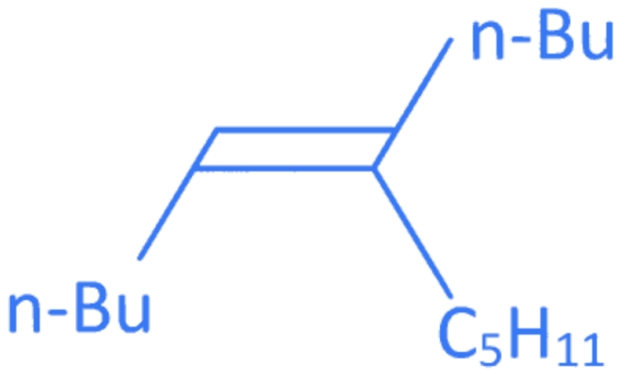


Options :

A.



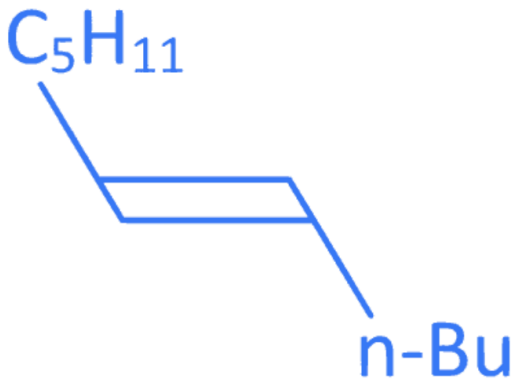
B.



C.

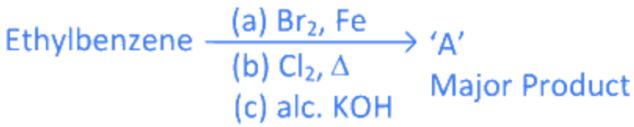


D.



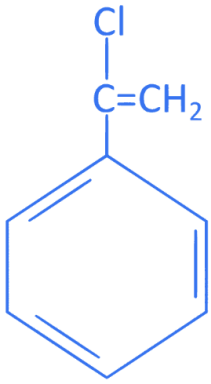
Question Number : 70 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Product 'A' of following sequence of reactions is

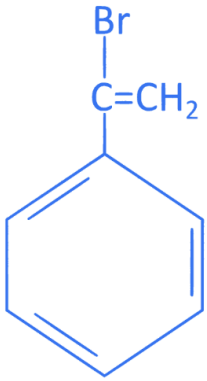


Options :

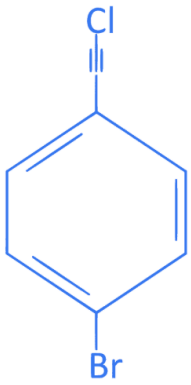
A.



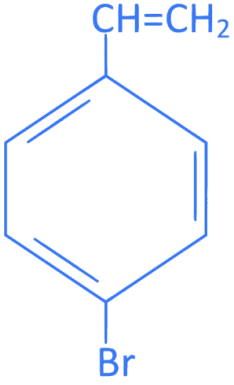
B.



C.

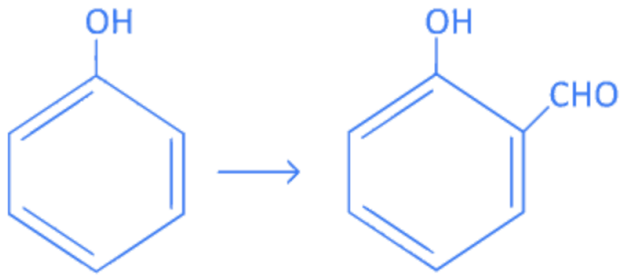
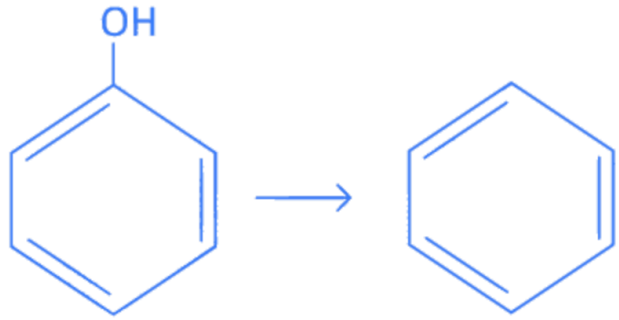
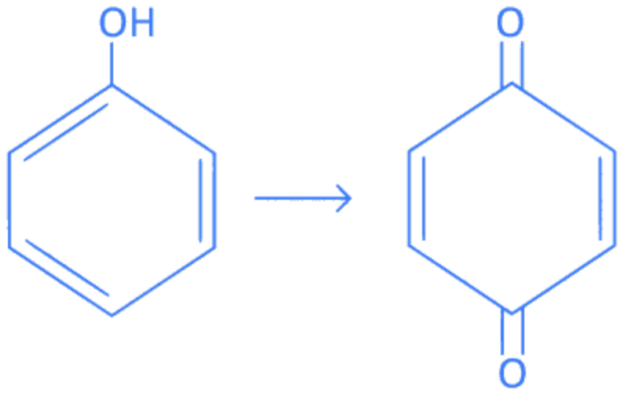
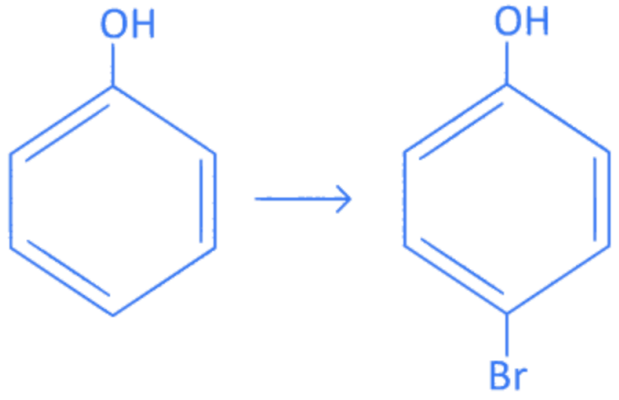


D.



Question Number : 71 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Match List-I with List-II.

	List-I		**List-II**
(A)		I.	Br_2 in CS_2
(B)		II.	$Na_2Cr_2O_7/H_2SO_4$
(C)		III.	Zn
(D)		IV.	$CHCl_3/NaOH$

Choose the correct answer from the options given below :

Options :

A. A-IV, B-III, C-II, D-I

B. A-IV, B-III, C-I, D-II

C. A-II, B-III, C-I, D-IV

D. A-IV, B-II, C-III, D-I

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Decarboxylation of all six possible forms of diaminobenzoic acids $C_6H_3(NH_2)_2COOH$ yields three products A, B and C. Three acids give a product 'A', two acids gives a product 'B' and one acid give a product 'C'. The melting point of product 'C' is

Options :

A. 63°C

B. 90°C

C. 104°C

D. 142°C

Question Number : 73 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Given below are two statements.

Statement I : Maltose has two α-D-glucose units linked at C_1 and C_4 and is a reducing sugar.

Statement II : Maltose has two monosaccharides : α-D-glucose and β-D-glucose linked at C_1 and C_6 and it is a non-reducing sugar.

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

Options :

A. Both Statement I and Statement II are true.

B. Both Statement I and Statement II are false.

C. Statement I is true but Statement II is false.

D. Statement I is false but Statement II is true.

Question Number : 74 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Match List I with List II.

	List-I (Anion)		**List-II (gas evolved on reaction with dil.H_2SO_2)**
(A)	CO_3^{2-}	I.	Colourless gas which turns lead acetate paper black.
(B)	S^{2-}	II.	Colourless gas which turns acidified potassium dichromate solution green.
(C)	SO_3^{2-}	III.	Brown fumes which turns acidified KI solution containing starch blue.
(D)	NO_2^-	IV.	Colourless gas evolved with brisk effervescence, which turns lime water milky.

Choose the correct answer from the options given below :

Options :

A. A-III, B-I, C-II, D-IV

B. A-II, B-I, C-IV, D-III

C. A-IV, B-I, C-III, D-II

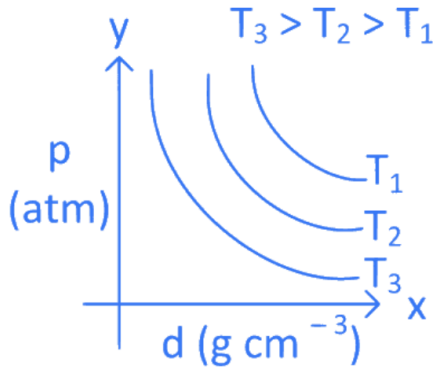
D. A-IV, B-I, C-II, D-III

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

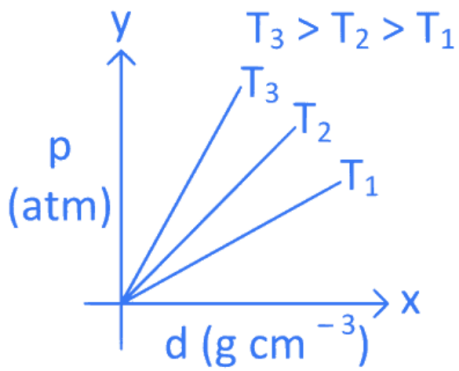
Which amongst the given plots is the correct plot for pressure (p) vs density (d) for an ideal gas?

Options :

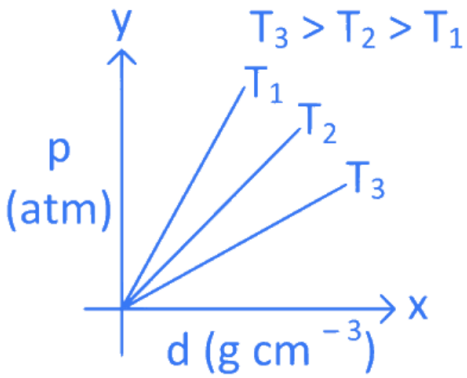
A.



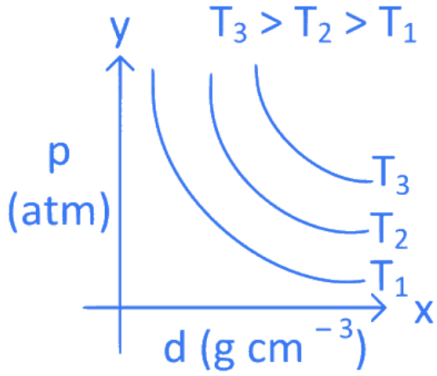
B.



C.



D.



Question Number : 76 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Statement I : Leaching of gold with cyanide ion in absence of air / O_2 leads to cyano complex of Au(III).

Statement II : Zinc is oxidized during the displacement reaction carried out for gold extraction.

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

Options :

A. Both Statement I and Statement II are correct.

B. Both Statement I and Statement II are incorrect.

C. Statement I is correct but Statement II is incorrect.

D. Statement I is incorrect but Statement II is correct.

Question Number : 77 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The gas produced by treating an aqueous solution of ammonium chloride with sodium nitrite is :

Options :

A. NH_3

B. N_2

C. N_2O

D. Cl_2

Question Number : 78 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

On the surface of polar stratospheric clouds, hydrolysis of chlorine nitrite gives A and B while its reaction with its reaction with HCl produces B and C. A, B and C are, respectively :

Options :

A. $HOCl, HNO_3, Cl_2$

B. $Cl_2, HNO_3, HOCl$

C. $HClO_2, HNO_2, HOCl$

D. $HOCl, HNO_2, Cl_2O$

Question Number : 79 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Which is true about Buna-N?

Options :

A. It is a linear polymer of 1, 3-butadiene.

B. It is obtained by copolymerization of 1, 3-butadiene and styrene.

C. It is obtained by copolymerization of 1, 3-butadiene and acrylonitrile.

D. The suffix N in Buna-N stands for its natural occurrence.

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Match List-I with List-II

	List-I		**List-II**
(A)	Antipyretic	I.	Reduces pain
(B)	Analgesic	II.	Reduces stress
(C)	Tranquilizer	III.	Reduces fever
(D)	Antacid	IV.	Reduces acidity (stomach)

Choose the correct answer from the options given below :

Options :

A. A-III, B-I, C-II, D-IV

B. A-III, B-I, C-IV, D-II

C. A-I, B-IV, C-II, D-III

D. A-I, B-III, C-II, D-IV

Chemistry Section B

Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Maximum Instruction Time :	0
Sub-Section Number :	1
Question Shuffling Allowed :	Yes
Is Section Default? :	No

Question Number : 81 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

116 g of a substance upon dissociation reaction, yields 7.5 g of hydrogen, 60 g of oxygen and 48.5 g of carbon. Given that the atomic masses of H, O and C are 1, 16 and 12, respectively. The data agrees with how many formulae of the following?

A. CH_3COOH, B. HCHO, C. CH_3OOCH_3, D. CH_3CHO

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 82 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

Consider the following set of quantum numbers.

	n	**1**	$\mathbf{m_1}$
A.	3	3	−3
B.	3	2	−2
C.	2	1	+1
D.	2	2	+2

The number of correct sets of quantum numbers is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 83 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

When 5 moles of He gas expand isothermally and reversibly at 300 K from 10 litre to 20 litre, the magnitude of the maximum work obtained is _____ J. [nearest integer] (Given : R = 8.3 J K^{-1} mol^{-1} and log 2 = 0.3010)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 84 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

A solution containing 2.5×10^{-3} kg of a solute dissolved in 75×10^{-3} kg of water boils at 373.535 K. The molar mass of the solute is _____ g mol^{-1}. [nearest integer] (Given : $K_b(H_2O)$ = 0.52 K kg mol^{-1} and boiling point of water = 373.15 K)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 85 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

pH value of 0.001 M NaOH solution is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 86 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

For the reaction taking place in the cell :

Pt (s)| H_2 (g)|H^+(aq) || Ag^+(aq) |Ag (s)

E^o_{cell} = + 0.5332 V.

The value of $\Delta_f G°$ is _____ kJ mol^{-1}. (in nearest integer)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 87 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

It has been found that for a chemical reaction with rise in temperature by 9 K the rate constant gets doubled. Assuming a reaction to be occurring at 300 K, the value of activation energy is found to be _____ kJ mol^{-1}. [nearest integer]

(Given ln10 = 2.3, R = 8.3 J K^{-1} mol^{-1}, log 2 = 0.30)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal

Text Areas : PlainText

Question Number : 88 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

0.25 g of an organic compound containing chlorine gave 0.40 g of silver chloride in Carius estimation. The percentage of chlorine present in the compound is _____. [in nearest integer]

(Given : Molar mass of Ag is 108 g mol^{-1} and that of Cl is 35.5 g mol^{-1})

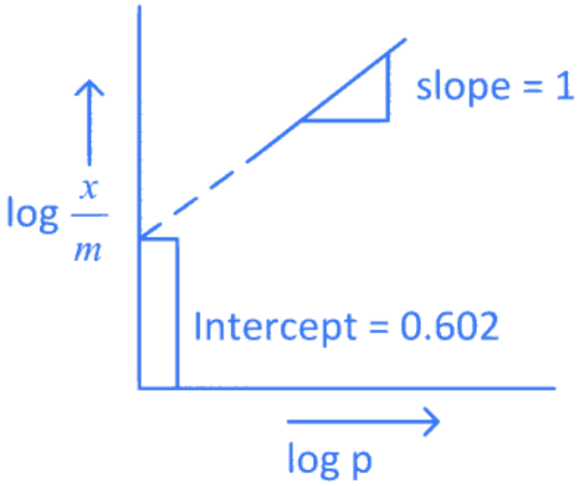
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 89 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript

BeO reacts with HF in presence of ammonia to give [A] which on thermal decomposition produces [B] and ammonium fluoride. Oxidation state of Be in [A] is _____.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText

Question Number : 90 Question Type : SA Display Question Number : Yes Keyboard Layout : Inscript



If the initial pressure of a gas is 0.03 atm, the mass of the gas adsorbed per gram of the adsorbent is _____ $\times 10^{-2}$ g.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText