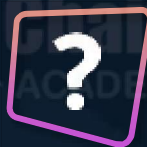


Find the energy to excite electron from first Bohr orbit of hydrogen atom to 2nd Bohr's orbit.(in eV)

?

Arrange the given metal ions in number in increasing order of unpaired electrons in low spin complex formed by Mn^{3+} , Cr^{3+} , Fe^{3+} , Co^{3+}

1. $Co^{3+} < Fe^{3+} < Mn^{3+} < Cr^{3+}$
2. $Co^{3+} < Mn^{3+} < Fe^{3+} < Cr^{3+}$
3. $Cr^{3+} < Mn^{3+} < Co^{3+} < Fe^{3+}$
4. $Cr^{3+} < Mn^{3+} < Fe^{3+} < Co^{3+}$

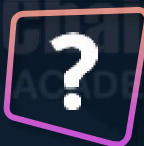


A projectile is thrown upward at an angle 60° with the horizontal. The speed of the projectile is 20 m/s when its direction of motion is 45° with the horizontal. The initial speed of the particle is,

?

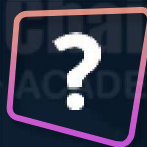
Match the following:-

LIST-1	LIST-2
a) Spring constant	i) $ML^2 T^{-2} K^{-1}$
b) Thermal conductivity	ii) $ML^{\circ}T^{-2}$
c) Boltzmann constant	iii) $ML^2 T^{-2} A^{-2}$
d) Inductance	iv) $MLT^{-3} K^{-1}$

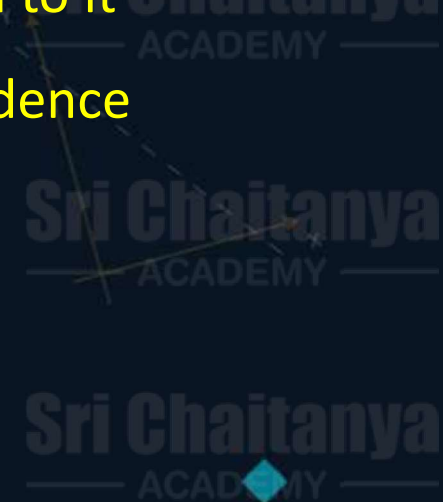


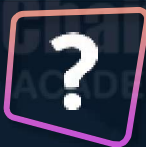
Gravitational force ratio after interchanging masses





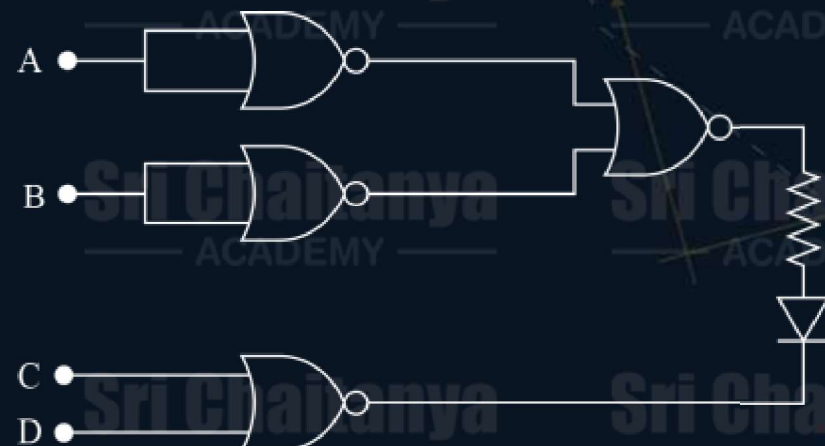
In an equilateral prism the incident ray is projected on to it then find the angle of reflected ray at the point of incidence when the emergent ray it grazed to the Surface

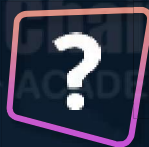




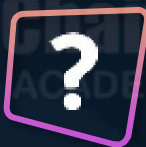
The following which given

- a) 1010
- b) 0010
- c) 1000
- d) 0001





Find the no of real solutions $x|x + 4| + 3|x + 2| + 10 = 0$



If the image of the point $P(1, 2, a)$ in the line $\frac{x-6}{3} = \frac{y-7}{2} = \frac{7-z}{2}$ is $Q(5, b, c)$ then $a^2 + b^2 + c^2 =$

- A) 293
- B) 298
- C) 283
- D) 264

?

$K_2Cr_2O_7$ is heated with KCl in presence of conc. H_2SO_4 . Find the correct match of product with their oxidation State



?

Statement-I: Sucrose is dextrorotatory and upon hydrolysis it becomes levorotatory.

Statement-II: Sucrose on hydrolysis gives glucose and fructose such that the levorotation of glucose is more than the dextrorotation of fructose.

?

Statement I: Gritho & Para nitro phenol can be differentiated by steam distillation.

Statement II: Glycerol is separated from spent lie by distillation under reduced pressure

Statement III: Chromatography separation based on differential affinities of component for a Stationary phase.

Statement IV : Aniline is commonly separated from mixture of water by crystallization

Select correct options

- (A) only I & IV**
- (B) only I, II & III**
- (C) only I, III**
- (D) All of these**

?

Which of the following is the correct order of the reactivity of the given nucleophiles when treated with CHBr_3 in methanol?



?

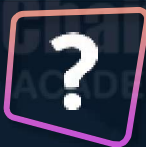
	List-I		List-II
(a)	$[\text{Ag}(\text{NH}_3)_2]^+$	(i)	Fehling's solution
(b)	Zn – Hg/HCl	(ii)	Clemmenson's reduction
(c)	$\text{NH}_2 - \text{NH}_2/\text{KOH}$	(iii)	Tollen's reagent
(d)	$\text{Cu}^{2+}/\text{OH}^-$	(iv)	Wolff-Kishner reduction

1 a(i), b(ii), c(iii), d(iv)

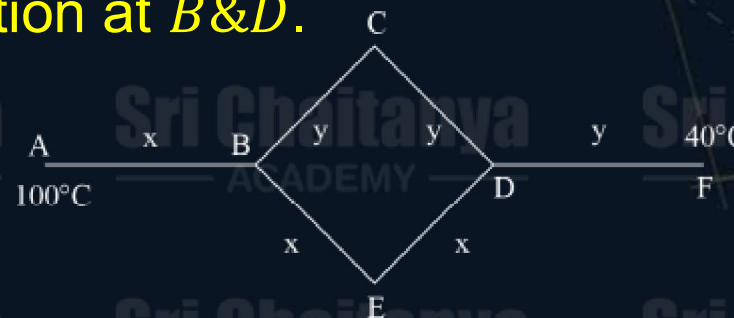
2 a(iv), b(iii), c(ii), d(i)

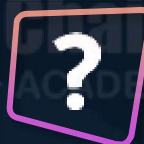
3 a(iii), b(ii), c(iv), d(i)

4 a(i), b(ii), c(iv), d(iii)

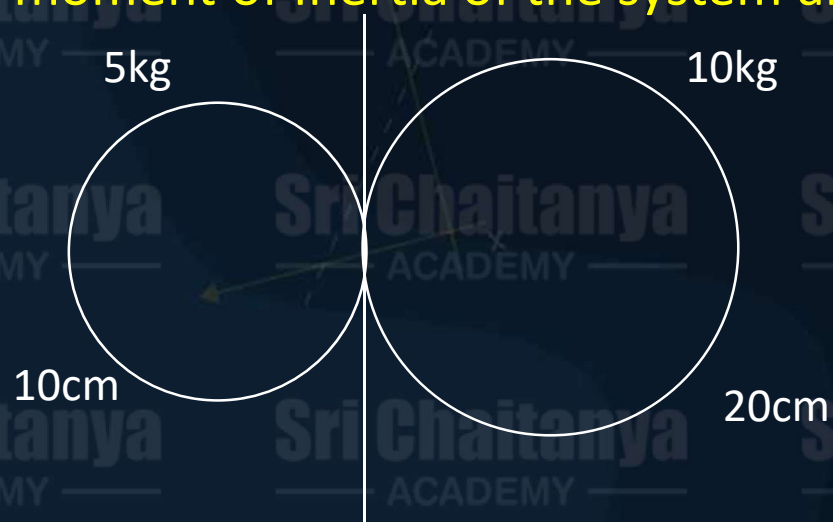


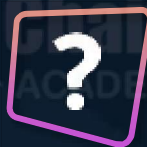
Six identical Metal rods are arranged as shown, find the temperatures at junction at B & D .





Two solid spheres masses 5 kg and 10 kg with radius 10 cm and 20 cm respectively are kept in contact as Shown. Find the moment of Inertia of the system about Common tangent





A simple pendulum has a bob with mass m and charge q . The pendulum string has negligible mass.

when a uniform a horizontal electric field \vec{E} is applied, the tension in the string changes, the final tension in the string, when pendulum attains equilibrium



?

Two distinct numbers a & b are selected at random from $1, 2, 3, \dots, 50$. The probability, that their product ab is divisible by 3 is

A) $\frac{8}{25}$

B) $\frac{660}{1225}$

C) $\frac{561}{1225}$

D) $\frac{272}{1225}$

?

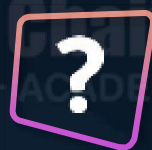
The coefficient of x^{48} in $(1+x) + 2(1+x)^2 + 3(1+x)^3 + \dots + 100(1+x)^{100}$ is equal to.

A) $100 \cdot {}^{101}C_{49} - {}^{101}C_{50}$

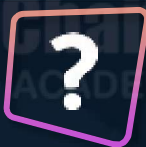
B) ${}^{100}C_{50} + {}^{101}C_{49}$

C) $100 \cdot {}^{100}C_{49} - {}^{100}C_{48}$

D) $100 \cdot {}^{100}C_{49} - {}^{100}C_{50}$



$\frac{\cos^2 48 - \sin^2 12}{\sin^2 24 - \sin^2 6} = \frac{\alpha + \beta\sqrt{5}}{2}$ where $\alpha, \beta \in N$ then $\alpha + \beta$



If $A = \begin{bmatrix} 2 & 3 \\ 3 & 5 \end{bmatrix}$ then the determinant of the matrix $(A^{2025} - 3A^{2024} + A^{2023})$ is

- A. 12
- B. 16
- C. 24
- D. 28

?

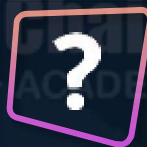
The coefficient of x^{48} in $(1+x) + 2(1+x)^2 + 3(1+x)^3 + \dots + 100(1+x)^{100}$ is equal to.

A) $100 \cdot {}^{101}C_{49} - {}^{101}C_{50}$

B) ${}^{100}C_{50} + {}^{101}C_{49}$

C) $100 \cdot {}^{100}C_{49} - {}^{100}C_{48}$

D) $100 \cdot {}^{100}C_{49} - {}^{100}C_{50}$



The no of solution of $\tan^{-1}4x + \tan^{-1}6x = \frac{\pi}{6}$, where $\frac{-1}{2\sqrt{6}} < x < \frac{1}{2\sqrt{6}}$ is equal to

- A) 0
- B) 2
- C) 1
- D) 3

?

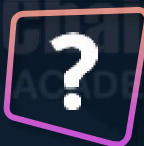
If the sum of first 4 terms of an AP is 6 and the sum of 6 terms is 4 ,
then sum of first 12 terms of an AP is

(1) -22

(2) -21

(3) -23

(4) -24

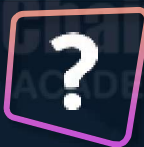


Let $M = \{1, 2, 3, \dots, 16\}$ and R be a Relation on M defined by xRy . If and only if $4y = 5x - 3$
Then, the number of elements required to added in R to make it symmetric is

?

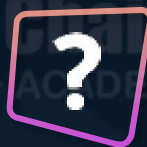
The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{dx}{[x]+4}$ is where $[.]$ denotes greatest integer function

? $x dy - y dx = (\sqrt{x^2 + y^2}) dx, y(1) = 0, y = y(x)$ **find** $y(3) =$



Chord joining at two points (x_1, y_1) (x_2, y_2) on the parabola $y^2 = 12x$. Intersect at right angle at the vertex then $x_1x_2 - y_1y_2 =$





Statement I:

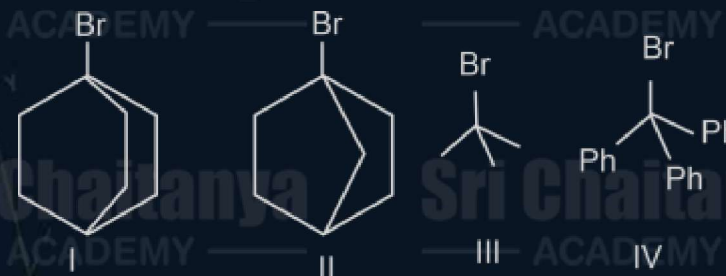


Major product is ortho substituted and minor product is para substituted.

Statement II: Ortho and para can be separated by steam distillation.

?

Reactivity of following on the basis of SN1 mechanism.

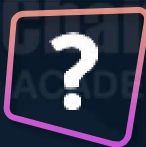


1. IV > III > I > II
2. II > IV > I > I
3. III > IV > I > II
4. IV > III > II > I

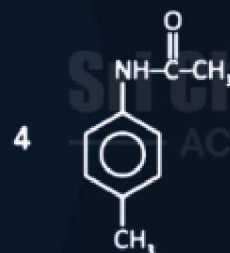
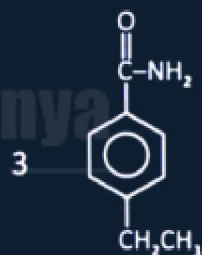
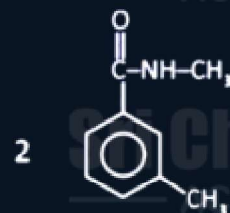
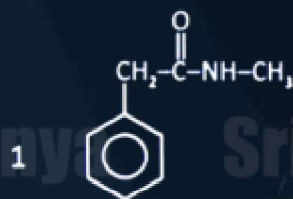
?

When X and Y react with fluorine then it forms EF_3 .
The XF_3 is a Lewis acid and YF_3 is a Lewis base.
Then hybridization of XF_3 and YF_3 is:

- (a) both sp^2
- (b) both sp^3
- (c) sp^2 and sp^3
- (d) sp^3 and sp^2



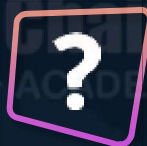
A compound 'A' with molecular formula $C_9H_{11}NO$ reacts with $Br_2/NaOH$ to give (X). (X) on reaction with $NaNO_2$ in dil. HCl gives compound (Y). When (Y) is treated with $CuCN$, followed by hydrolysis gives (Z). The compound (A) on hydrolysis also gives compound (Z). Identify compound (A).



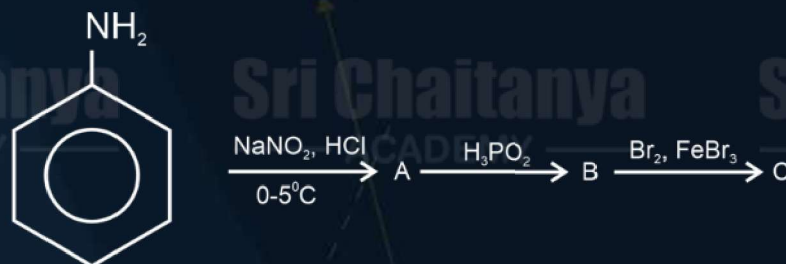
?

Which of the following statement is correct regarding the nature and directive influence of $-\text{NO}_2$ group in nitration of benzene.

- 1 It is an activating group and ortho/para director
- 2 It is a deactivating group and ortho/para director
- 3 It is a deactivating group and meta director
- 4 It is an activating group and meta director



Consider the following sequence of reaction and identify A, B and C respectively.



1. $\text{C}_6\text{H}_5\text{OH}$, C_6H_6 , $\text{C}_6\text{H}_4\text{Br}_2$
2. $\text{C}_6\text{H}_5\text{N}_2^+\text{Cl}^-$, C_6H_6 , $\text{C}_6\text{H}_5\text{Br}$
3. $\text{C}_6\text{H}_5\text{NO}_2$, $\text{C}_6\text{H}_5\text{OH}$, $\text{C}_6\text{H}_5\text{Br}$
4. $\text{C}_6\text{H}_5\text{Cl}$, $\text{C}_6\text{H}_5\text{OH}$, C_6H_6

?

Four elements from Boron to Oxygen have the following IE_1 values (in kJ mol^{-1}):

1086.5, 800.6, 1313.9, 1402.3

The value of IE_1 for "Nitrogen" is _____.

?

An element of p-block forms a hydride EH_4 .
Gas of hydride is passed through a basic solution of $\text{K}_2[\text{HgI}_4]$.
Then a brown ppt. is formed.
Select correct option(s):

1. Element E has maximum covalency equal to 5.
2. Brown ppt. of $\text{HgO} \cdot \text{Hg}(\text{NH}_2)\text{I}$ is formed.
3. Element E has maximum Electron affinity in its group.
4. Gas is phosphine.

?

If for two reactions first reaction have $K_1 = 10^6 e^{\frac{-30000}{T}}$ & for second reaction $K_2 = 10^4 e^{\frac{-24000}{T}}$ then at which temperature both reactions have same value of rate constant. (Report your answer in nearest integer)

?

Given below are two statements

Statement-1 : K_H is constant with change in concentration of gas till solution is dilute at given temperature.

Statement-II : According to Henry's Law, partial pressure of gas in vapour phase is inversely proportional to mole fraction of gas in solution.

- 1. Both Statement-I and Statement-II are correct**
- 2. Both Statement-I and Statement-II are incorrect.**
- 3. Statement-I is correct, Statement-II is incorrect**
- 4. Statement-I is incorrect and Statement-II is correct**

?

Consider a first order reaction:



3 different solutions are taken rate of reaction

Solution 1: 100 mL 10 M 'A' $-r_1$

Solution 2 : 200 mL 10M 'A' $-r_2$

Solution 3: 100 mL 10 M 'A' +100 mL water $-r_3$

The correct order of the rates of reactions is,

1 $r_1 = r_2 = r_3$

2 $r_1 = r_2 < r_3$

3 $r_1 = r_2 > r_3$

4 $r_1 < r_2 = r_3$

?

Bohr's radius of H -atom is 2.12×10^{-10} m. Calculate the energy at this level.

1 - 5.44×10^{-19} J

2 - 2.176×10^{-18} J

3 - 54.4×10^{-19} J

4 - 2.3×10^{-19} J























































