

# Chemistry

Section Id :	405036422
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	405036811
Question Shuffling Allowed :	Yes

Question Number : 26 Question Id : 40503611556 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical  
Correct Marks : 4 Wrong Marks : 1

Which one of the following statements is not true ?

Options :

40503641881. Lactose ( $C_{11}H_{22}O_{11}$ ) is a disaccharide and it contains 8 hydroxyl groups.

40503641882. On acid hydrolysis, lactose gives one molecule of D(+)-glucose and one molecule of D(+)-galactose.

40503641883. Lactose is a reducing sugar and it gives Fehling's test.

40503641884. Lactose contains  $\alpha$ -glycosidic linkage between  $C_1$  of galactose and  $C_4$  of glucose.

Question Number : 26 Question Id : 40503611556 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन सा एक कथन सही नहीं है?

Options :

40503641881. लैक्टोस ( $C_{11}H_{22}O_{11}$ ) एक डाइसेकैराइड है तथा इसमें 8 हाइड्रॉक्सिल समूह हैं।

40503641882. अम्लीय जल अपघटन करने पर, लैक्टोस D(+)-ग्लूकोस का एक अणु तथा D(+)-गैलैक्टोस का एक अणु देता है।

40503641883. लैक्टोस एक अपचायी शर्करा है तथा यह फेहलिंग परीक्षण देता है।

40503641884. लैक्टोस में गैलैक्टोस के  $C_1$  तथा ग्लूकोस के  $C_4$  के बीच  $\alpha$ -ग्लाइकोसाइडी बंध होता है।

Question Number : 27 Question Id : 40503611557 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct match between Item - I and

Item - II is :

- | Item - I           | Item - II                           |
|--------------------|-------------------------------------|
| (a) Natural rubber | (I) 1, 3-butadiene + styrene        |
| (b) Neoprene       | (II) 1, 3-butadiene + acrylonitrile |
| (c) Buna-N         | (III) Chloroprene                   |
| (d) Buna-S         | (IV) Isoprene                       |

Options :

40503641885. (a) - (III), (b) - (IV), (c) - (I), (d) - (II)

40503641886. (a) - (III), (b) - (IV), (c) - (II), (d) - (I)

40503641887. (a) - (IV), (b) - (III), (c) - (I), (d) - (II)

40503641888. (a) - (IV), (b) - (III), (c) - (II), (d) - (I)

**Question Number : 27 Question Id : 40503611557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

मद - I तथा मद - II के बीच सही सुमेल है :

मद - I	मद - II
(a) प्राकृतिक रबर (I)	1, 3-ब्यूटाडाईन + स्टाइरीन
(b) नियोप्रीन (II)	1, 3-ब्यूटाडाईन + एक्रिलोनाइट्राइल
(c) ब्यूना-N (III)	क्लोरोप्रीन
(d) ब्यूना-S (IV)	आइसोप्रीन

**Options :**

40503641885. (a) - (III), (b) - (IV), (c) - (I), (d) - (II)

40503641886. (a) - (III), (b) - (IV), (c) - (II), (d) - (I)

40503641887. (a) - (IV), (b) - (III), (c) - (I), (d) - (II)

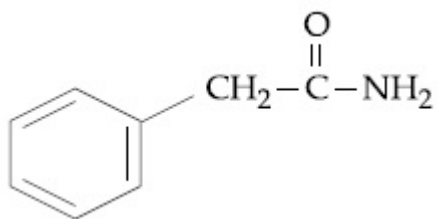
40503641888. (a) - (IV), (b) - (III), (c) - (II), (d) - (I)

**Question Number : 28 Question Id : 40503611558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

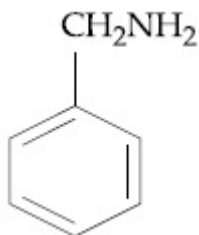
**Correct Marks : 4 Wrong Marks : 1**

Which of the following compounds can be prepared in good yield by Gabriel phthalimide synthesis ?

**Options :**

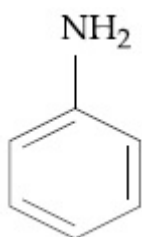


40503641889.



40503641890.

40503641891. CCN(C)C



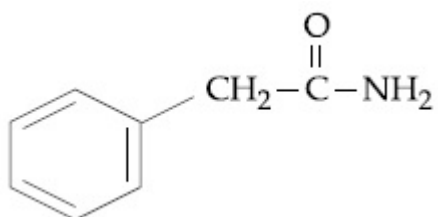
40503641892.

**Question Number : 28 Question Id : 40503611558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

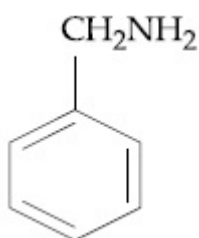
**Correct Marks : 4 Wrong Marks : 1**

निम्नलिखित यौगिकों में से किसे अच्छी मात्रा में गैब्रियल थैलिमाइड संश्लेषण के द्वारा बनाया जा सकता है?

**Options :**

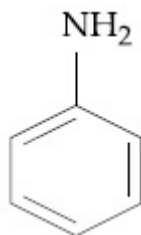


40503641889.



40503641890.

40503641891.  $\text{CH}_3 - \text{CH}_2 - \text{NHCH}_3$



40503641892.

**Question Number : 29 Question Id : 40503611559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The correct match between Item - I (starting material) and Item - II (reagent) for the preparation of benzaldehyde is :

Item - I	Item - II
(I) Benzene	(P) HCl and $\text{SnCl}_2, \text{H}_3\text{O}^+$
(II) Benzonitrile	(Q) $\text{H}_2, \text{Pd}-\text{BaSO}_4, \text{S}$ and quinoline
(III) Benzoyl Chloride	(R) CO, HCl and $\text{AlCl}_3$

**Options :**

40503641893. (I) - (R), (II) - (P) and (III) - (Q)

40503641894. (I) - (R), (II) - (Q) and (III) - (P)

40503641895. (I) - (Q), (II) - (R) and (III) - (P)

40503641896. (I) - (P), (II) - (Q) and (III) - (R)

**Question Number : 29 Question Id : 40503611559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

बेन्ज़ैलिडहाइड को बनाने के लिए, मद - I (आरंभिक द्रव्य) तथा मद - II (अभिकारक) के बीच सही सुमेल है :

मद - I	मद - II
(I) बेन्ज़ीन	(P) HCl तथा SnCl <sub>2</sub> , H <sub>3</sub> O <sup>+</sup>
(II) बेन्ज़ोनाइट्राइल	(Q) H <sub>2</sub> , Pd- BaSO <sub>4</sub> , S तथा क्विनोलीन
(III) बेन्ज़ायल क्लोराइड	(R) CO, HCl तथा AlCl <sub>3</sub>

**Options :**

40503641893. (I) - (R), (II) - (P) तथा (III) - (Q)

40503641894. (I) - (R), (II) - (Q) तथा (III) - (P)

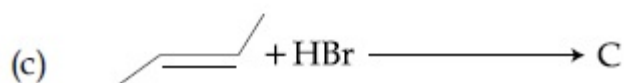
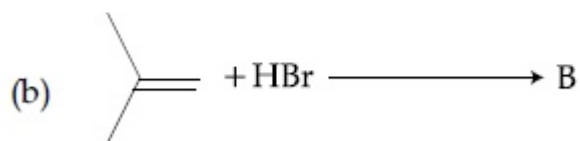
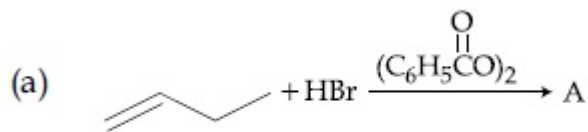
40503641895. (I) - (Q), (II) - (R) तथा (III) - (P)

40503641896. (I) - (P), (II) - (Q) तथा (III) - (R)

**Question Number : 30 Question Id : 40503611560 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The increasing order of the boiling points of the major products A, B and C of the following reactions will be :



Options :

40503641897. A < B < C

40503641898. B < C < A

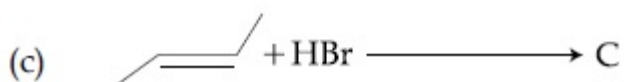
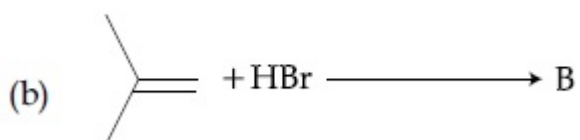
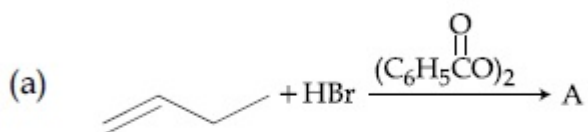
40503641899. C < A < B

40503641900. A < C < B

Question Number : 30 Question Id : 40503611560 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
 Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं में मुख्य उत्पादों A, B तथा C के क्वथनांकों का बढ़ता क्रम होगा :



Options :

40503641897. A < B < C

40503641898.  $B < C < A$

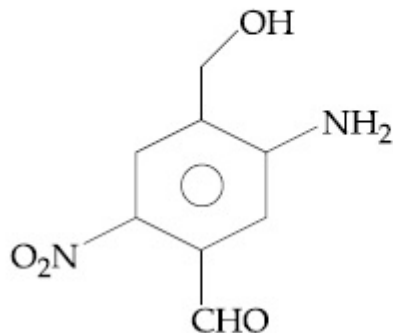
40503641899.  $C < A < B$

40503641900.  $A < C < B$

**Question Number : 31 Question Id : 40503611561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The IUPAC name of the following compound is :



**Options :**

40503641901. 3-amino-4-hydroxymethyl-5-nitrobenzaldehyde

40503641902. 5-amino-4-hydroxymethyl-2-nitrobenzaldehyde

40503641903. 2-nitro-4-hydroxymethyl-5-amino benzaldehyde

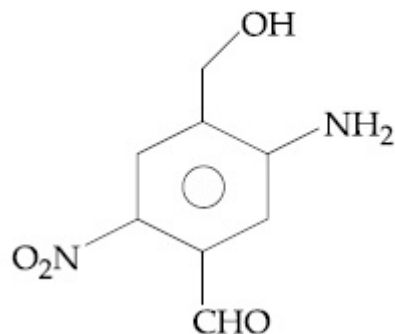
40503641904. 4-amino-2-formyl-5-hydroxymethyl nitrobenzene

**Question Number : 31 Question Id : 40503611561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**



निम्नलिखित यौगिक का IUPAC नाम है :



Options :

40503641901. 3-ऐमीनो-4-हाइड्रॉक्सीमेथिल-5-नाइट्रोबेन्जैल्डहाइड
40503641902. 5-ऐमीनो-4-हाइड्रॉक्सीमेथिल-2-नाइट्रोबेन्जैल्डहाइड
40503641903. 2-नाइट्रो-4-हाइड्रॉक्सीमेथिल-5-ऐमीनो बेन्जैल्डहाइड
40503641904. 4-ऐमीनो-2-फार्मिल-5-हाइड्रॉक्सीमेथिल नाइट्रोबेन्जीन

Question Number : 32 Question Id : 40503611562 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical  
Correct Marks : 4 Wrong Marks : 1

Match the following :

Test / Method	Reagent
(i) Lucas Test	(a) $C_6H_5SO_2Cl$ / aq. KOH
(ii) Dumas method	(b) $HNO_3$ / $AgNO_3$
(iii) Kjeldahl's method	(c) $CuO/CO_2$
(iv) Hinsberg Test	(d) Conc. HCl and $ZnCl_2$
	(e) $H_2SO_4$

Options :

40503641905. (i)-(b), (ii)-(d), (iii)-(e), (iv)-(a)

40503641906. (i)-(d), (ii)-(c), (iii)-(b), (iv)-(e)

40503641907. (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)

40503641908. (i)-(d), (ii)-(c), (iii)-(e), (iv)-(a)

Question Number : 32 Question Id : 40503611562 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित का सुमेल कीजिए :

परीक्षण / विधि	अधिकर्मक
(i) ल्यूकास परीक्षण	(a) $C_6H_5SO_2Cl$ / जलीय KOH
(ii) ड्यूमा विधि	(b) $HNO_3$ / $AgNO_3$
(iii) कैल्डॉल विधि	(c) $CuO/CO_2$
(iv) हिंसबर्ग परीक्षण	(d) सान्द्र HCl & $ZnCl_2$
	(e) $H_2SO_4$

**Options :**

40503641905. (i)-(b), (ii)-(d), (iii)-(e), (iv)-(a)

40503641906. (i)-(d), (ii)-(c), (iii)-(b), (iv)-(e)

40503641907. (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)

40503641908. (i)-(d), (ii)-(c), (iii)-(e), (iv)-(a)

**Question Number : 33 Question Id : 40503611563 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The element that can be refined by  
distillation is :

**Options :**

40503641909. zinc

40503641910. nickel

40503641911. tin

40503641912. gallium

**Question Number : 33 Question Id : 40503611563 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

तत्व जिसका परिष्करण आसवन के द्वारा किया जाता  
है, है :

**Options :**

40503641909. जिंक

40503641910. निकेल

40503641911. टिन

40503641912. गैलियम

**Question Number : 34 Question Id : 40503611564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

Dihydrogen of high purity (> 99.95%) is obtained through :

**Options :**

40503641913. the electrolysis of acidified water using Pt electrodes.
40503641914. the electrolysis of brine solution.
40503641915. the reaction of Zn with dilute HCl.
40503641916. the electrolysis of warm  $\text{Ba}(\text{OH})_2$  solution using Ni electrodes.

**Question Number : 34 Question Id : 40503611564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

अतिशुद्ध डाइहाइड्रोजन (> 99.95%) निम्न में से किसके द्वारा प्राप्त होता है?

**Options :**

40503641913. Pt इलेक्ट्रोड का उपयोग करके अम्लीकृत जल का विद्युत-अपघटन
40503641914. लवण-जल विलयन का विद्युत-अपघटन
40503641915. Zn की तनु HCl के साथ अभिक्रिया
40503641916. Ni इलेक्ट्रोड का उपयोग करके  $\text{Ba}(\text{OH})_2$  विलयन का विद्युत-अपघटन

Question Number : 35 Question Id : 40503611565 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Match the following compounds  
(Column-I) with their uses (Column-II) :

S. No.	Column - I	S. No.	Column - II
(I)	$\text{Ca(OH)}_2$	(A)	casts of statues
(II)	$\text{NaCl}$	(B)	white wash
(III)	$\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$	(C)	antacid
(IV)	$\text{CaCO}_3$	(D)	washing soda preparation

Options :

40503641917. (I)-(D), (II)-(A), (III)-(C), (IV)-(B)

40503641918. (I)-(C), (II)-(D), (III)-(B), (IV)-(A)

40503641919. (I)-(B), (II)-(D), (III)-(A), (IV)-(C)

40503641920. (I)-(B), (II)-(C), (III)-(D), (IV)-(A)

Question Number : 35 Question Id : 40503611565 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों (कालम-I) का उनके उपयोगों  
(कालम-II) के साथ सुमेल कीजिए :

क्रमांक	कालम - I	क्रमांक	कालम - II
(I)	$\text{Ca(OH)}_2$	(A)	मूर्तियों की ढलाई
(II)	$\text{NaCl}$	(B)	सफेदी
(III)	$\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$	(C)	प्रति-अम्ल
(IV)	$\text{CaCO}_3$	(D)	धोने के सोडा का बनाना

Options :

40503641917. (I)-(D), (II)-(A), (III)-(C), (IV)-(B)

40503641918. (I)-(C), (II)-(D), (III)-(B), (IV)-(A)

40503641919. (I)-(B), (II)-(D), (III)-(A), (IV)-(C)

40503641920. (I)-(B), (II)-(C), (III)-(D), (IV)-(A)

**Question Number : 36 Question Id : 40503611566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The reaction of NO with  $N_2O_4$  at 250 K gives :

**Options :**

40503641921.  $NO_2$

40503641922.  $N_2O_3$

40503641923.  $N_2O_5$

40503641924.  $N_2O$

**Question Number : 36 Question Id : 40503611566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

250 K पर NO की  $N_2O_4$  के साथ अभिक्रिया देती है :

**Options :**

40503641921.  $NO_2$

40503641922.  $N_2O_3$

40503641923.  $N_2O_5$

40503641924.  $\text{N}_2\text{O}$

**Question Number : 37 Question Id : 40503611567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

Reaction of an inorganic sulphite X with dilute  $\text{H}_2\text{SO}_4$  generates compound Y. Reaction of Y with NaOH gives X. Further, the reaction of X with Y and water affords compound Z. Y and Z, respectively, are :

**Options :**

40503641925. S and  $\text{Na}_2\text{SO}_3$

40503641926.  $\text{SO}_2$  and  $\text{NaHSO}_3$

40503641927.  $\text{SO}_3$  and  $\text{NaHSO}_3$

40503641928.  $\text{SO}_2$  and  $\text{Na}_2\text{SO}_3$

**Question Number : 37 Question Id : 40503611567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

एक अकार्बनिक सल्फाइड X तनु  $\text{H}_2\text{SO}_4$  के साथ अभिक्रिया करके यौगिक Y बनाता है। Y की NaOH के साथ अभिक्रिया X देती है। पुनः, X की Y तथा जल के साथ अभिक्रिया यौगिक Z देती है। Y तथा Z क्रमशः, हैं :

**Options :**

40503641925. S तथा  $\text{Na}_2\text{SO}_3$

40503641926.  $\text{SO}_2$  तथा  $\text{NaHSO}_3$

40503641927.  $\text{SO}_3$  तथा  $\text{NaHSO}_3$

40503641928.  $\text{SO}_2$  तथा  $\text{Na}_2\text{SO}_3$

**Question Number : 38 Question Id : 40503611568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

Mischmetal is an alloy consisting mainly of :

**Options :**

40503641929. lanthanoid metals

40503641930. actinoid metals

40503641931. lanthanoid and actinoid metals

40503641932. actinoid and transition metals

**Question Number : 38 Question Id : 40503611568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

मिश्र धातु निम्नलिखित में से किसका मिश्रतु है?

**Options :**

40503641929. लैन्थेनायड धातुएँ

40503641930. ऐक्टिनायड धातुएँ

40503641931. लैन्थेनायड तथा ऐक्टिनायड धातुएँ

40503641932. ऐक्टिनायड तथा संक्रमण धातुएँ

**Question Number : 39 Question Id : 40503611569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**



For a  $d^4$  metal ion in an octahedral field,  
the correct electronic configuration is :

Options :

40503641933.  $t_{2g}^3 e_g^1$  when  $\Delta_o > P$

40503641934.  $t_{2g}^3 e_g^1$  when  $\Delta_o < P$

40503641935.  $t_{2g}^4 e_g^0$  when  $\Delta_o < P$

40503641936.  $e_g^2 t_{2g}^2$  when  $\Delta_o < P$

Question Number : 39 Question Id : 40503611569 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अष्टफलकीय क्षेत्र में एक  $d^4$  धातु आयन के लिए सही  
इलेक्ट्रॉनिक विन्यास है :

Options :

40503641933.  $t_{2g}^3 e_g^1$  जब  $\Delta_o > P$

40503641934.  $t_{2g}^3 e_g^1$  जब  $\Delta_o < P$

40503641935.  $t_{2g}^4 e_g^0$  जब  $\Delta_o < P$

40503641936.  $e_g^2 t_{2g}^2$  जब  $\Delta_o < P$

Question Number : 40 Question Id : 40503611570 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The average molar mass of chlorine is  
 $35.5 \text{ g mol}^{-1}$ . The ratio of  $^{35}\text{Cl}$  to  $^{37}\text{Cl}$  in  
naturally occurring chlorine is close to :

Options :

40503641937. 1 : 1

40503641938. 2 : 1

40503641939. 3 : 1

40503641940. 4 : 1

**Question Number : 40 Question Id : 40503611570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

क्लोरीन का औसत मोलर द्रव्यमान  $35.5 \text{ g mol}^{-1}$  है।  
प्राकृतिक क्लोरीन में  $^{35}\text{Cl}$  और  $^{37}\text{Cl}$  का अनुपात लगभग है :

**Options :**

40503641937. 1 : 1

40503641938. 2 : 1

40503641939. 3 : 1

40503641940. 4 : 1

**Question Number : 41 Question Id : 40503611571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

A crystal is made up of metal ions ' $M_1$ ' and ' $M_2$ ' and oxide ions. Oxide ions form a ccp lattice structure. The cation ' $M_1$ ' occupies 50% of octahedral voids and the cation ' $M_2$ ' occupies 12.5% of tetrahedral voids of oxide lattice. The oxidation numbers of ' $M_1$ ' and ' $M_2$ ' are, respectively :

**Options :**

40503641941. +2, +4

40503641942. +4, +2

40503641943. +1, +3

40503641944. +3, +1

**Question Number : 41 Question Id : 40503611571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

धातु आयनों 'M<sub>1</sub>' तथा 'M<sub>2</sub>' तथा ऑक्साइड आयनों का एक क्रिस्टल बनाया जाता है। ऑक्साइड आयन एक ccp जालक संरचना बनाते हैं। धनायन 'M<sub>1</sub>' आक्साइड जालक के 50% अष्टफलकी रिक्तियों को भरता है तथा 'M<sub>2</sub>' 12.5% चतुष्फलकी रिक्तियों को भरता है। 'M<sub>1</sub>' तथा 'M<sub>2</sub>' की ऑक्सीकरण संख्या क्रमशः हैं :

**Options :**

40503641941. +2, +4

40503641942. +4, +2

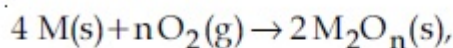
40503641943. +1, +3

40503641944. +3, +1

**Question Number : 42 Question Id : 40503611572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

For a reaction,



the free energy change is plotted as a function of temperature. The temperature below which the oxide is stable could be inferred from the plot as the point at which :

**Options :**

40503641945. the slope changes from negative to positive

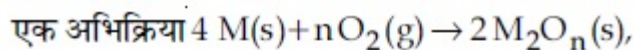
40503641946. the slope changes from positive to negative

40503641947. the free energy change shows a change from negative to positive value

40503641948. the slope changes from positive to zero

**Question Number : 42 Question Id : 40503611572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**



के लिए मुक्त ऊर्जा परिवर्तन को ताप के फलन के रूप में आलेखित किया जाता है। आलेख से ताप, जिसके नीचे ऑक्साइड स्थायी हैं को उस बिन्दु के रूप में अनुमानित किया जाता है जिस पर :

**Options :**

40503641945. स्लोप का परिवर्तन ऋणात्मक से धनात्मक होता है।

40503641946. स्लोप का परिवर्तन धनात्मक से ऋणात्मक होता है।

40503641947. मुक्त ऊर्जा परिवर्तन ऋणात्मक से धनात्मक मान में परिवर्तन दर्शाता है।

40503641948. स्लोप का परिवर्तन धनात्मक से शून्य में होता है।

**Question Number : 43 Question Id : 40503611573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

A set of solutions is prepared using 180 g of water as a solvent and 10 g of different non-volatile solutes A, B and C. The relative lowering of vapour pressure in the presence of these solutes are in the order

[Given, molar mass of A =  $100 \text{ g mol}^{-1}$ ; B =  $200 \text{ g mol}^{-1}$ ; C =  $10,000 \text{ g mol}^{-1}$ ]

**Options :**

40503641949.  $A > B > C$

40503641950.  $B > C > A$

40503641951.  $C > B > A$

40503641952.  $A > C > B$

**Question Number : 43 Question Id : 40503611573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

जल के 180 g को विलायक के रूप में तथा विभिन्न अवाष्पशील विलेयों A, B तथा C के 10 g का उपयोग करके विलयनों का एक समुच्चय बनाया जाता है। इन विलेयों की उपस्थिति में वाष्प दाब के सापेक्ष अवनयन का क्रम है :

[दिया गया है : A का मोलर द्रव्यमान =  $100 \text{ g mol}^{-1}$ ; B =  $200 \text{ g mol}^{-1}$ ; C =  $10,000 \text{ g mol}^{-1}$ ]

**Options :**

40503641949.  $A > B > C$

40503641950.  $B > C > A$

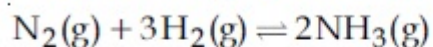
40503641951.  $C > B > A$

40503641952.  $A > C > B$

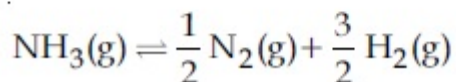
**Question Number : 44 Question Id : 40503611574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

The value of  $K_c$  is 64 at 800 K for the reaction



The value of  $K_c$  for the following reaction is :



**Options :**

40503641953.  $1/64$

40503641954.  $8$

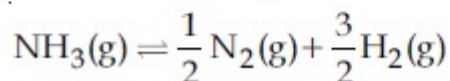
40503641955.  $1/8$

40503641956.  $1/4$

**Question Number : 44 Question Id : 40503611574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

अभिक्रिया,  $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ , के लिए  $K_c$  का मान 800 K पर 64 है। निम्नलिखित अभिक्रिया के लिए  $K_c$  का मान है :



Options :

40503641953.  $1/64$

40503641954. 8

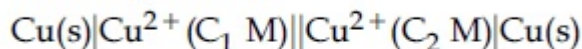
40503641955.  $1/8$

40503641956.  $1/4$

Question Number : 45 Question Id : 40503611575 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For the given cell ;



change in Gibbs energy ( $\Delta G$ ) is negative,

if :

Options :

40503641957.  $C_1 = C_2$

40503641958.  $C_2 = C_1 / \sqrt{2}$

40503641959.  $C_2 = \sqrt{2} C_1$

40503641960.  $C_1 = 2 C_2$

Question Number : 45 Question Id : 40503611575 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option  
Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिये गये सेल

$\text{Cu(s)}|\text{Cu}^{2+}(\text{C}_1 \text{ M})||\text{Cu}^{2+}(\text{C}_2 \text{ M})|\text{Cu(s)}$  के लिए गिब्स ऊर्जा में परिवर्तन ( $\Delta G$ ) ऋणात्मक होगी, यदि :

Options :

40503641957.  $C_1 = C_2$

40503641958.  $C_2 = C_1 / \sqrt{2}$

40503641959.  $C_2 = \sqrt{2} C_1$

40503641960.  $C_1 = 2 C_2$

Sub-Section Number :

2

Sub-Section Id :

405036812

Question Shuffling Allowed :

Yes

Question Number : 46 Question Id : 40503611576 Question Type : SA Display Question Number : Yes  
Correct Marks : 4 Wrong Marks : 0

The atomic number of Unnilunium is

\_\_\_\_\_.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 46 Question Id : 40503611576 Question Type : SA Display Question Number : Yes  
Correct Marks : 4 Wrong Marks : 0

यूनिल्यूनियम (Unnilunium) की परमाणु संख्या है

\_\_\_\_\_।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText



Possible Answers :

5 to 5.002

Question Number : 47 Question Id : 40503611577 Question Type : SA Display Question Number : Yes  
Correct Marks : 4 Wrong Marks : 0

If the solubility product of  $AB_2$  is  $3.20 \times 10^{-11} M^3$ , then the solubility of  $AB_2$  in pure water is \_\_\_\_\_  $\times 10^{-4} mol L^{-1}$ .

[Assuming that neither kind of ion reacts with water]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 47 Question Id : 40503611577 Question Type : SA Display Question Number : Yes  
Correct Marks : 4 Wrong Marks : 0

यदि  $AB_2$  का विलेयता गुणांक  $3.20 \times 10^{-11} M^3$  है, तो शुद्ध जल में  $AB_2$  की विलेयता है \_\_\_\_\_  $\times 10^{-4} mol L^{-1}$ । (यह मान कर कि कोई भी आयन जल से अभिक्रिया नहीं करता है)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.002

Question Number : 48 Question Id : 40503611578 Question Type : SA Display Question Number : Yes  
Correct Marks : 4 Wrong Marks : 0

The rate of a reaction decreased by 3.555 times when the temperature was changed from  $40^\circ C$  to  $30^\circ C$ . The activation energy (in  $kJ mol^{-1}$ ) of the reaction is \_\_\_\_\_.  
Take;  $R = 8.314 J mol^{-1} K^{-1}$   $\ln 3.555 = 1.268$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.002

**Question Number : 48 Question Id : 40503611578 Question Type : SA Display Question Number : Yes**

**Correct Marks : 4 Wrong Marks : 0**

जब ताप को  $40^{\circ}\text{C}$  से  $30^{\circ}\text{C}$  में परिवर्तित करते हैं तो एक अभिक्रिया की दर 3.555 गुना कम हो जाती है। अभिक्रिया की सक्रियण ऊर्जा ( $\text{kJ mol}^{-1}$  में ) है \_\_\_\_\_। माने  $\ln 3.555 = 1.268$ ;  
 $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.002

**Question Number : 49 Question Id : 40503611579 Question Type : SA Display Question Number : Yes**

**Correct Marks : 4 Wrong Marks : 0**

For Freundlich adsorption isotherm, a plot of  $\log (x/m)$  ( $y$ -axis) and  $\log p$  ( $x$ -axis) gives a straight line. The intercept and slope for the line is 0.4771 and 2, respectively. The mass of gas, adsorbed per gram of adsorbent if the initial pressure is 0.04 atm, is \_\_\_\_\_  $\times 10^{-4}\text{g}$ .  
( $\log 3 = 0.4771$ )

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.002

**Question Number : 49 Question Id : 40503611579 Question Type : SA Display Question Number : Yes**  
**Correct Marks : 4 Wrong Marks : 0**

फ्रॉयन्डलिक अधिशोषण समतापी के लिए,  
 $\log(x/m)$  ( $y$ -अक्ष) तथा  $\log p$  ( $x$ -अक्ष) का आलेख  
एक सीधी रेखा देता है। रेखा के लिए अंतः खण्ड  
तथा स्लोप क्रमशः 0.4771 तथा 2 हैं। यदि आरंभिक  
दाब 0.04 atm है, तो प्रति ग्राम अधिशोषक पर  
अधिशोषित गैस की संहति होगी  
\_\_\_\_\_  $\times 10^{-4}g$ । ( $\log 3 = 0.4771$ )

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

5 to 5.002

**Question Number : 50 Question Id : 40503611580 Question Type : SA Display Question Number : Yes**  
**Correct Marks : 4 Wrong Marks : 0**

A solution of phenol in chloroform when  
treated with aqueous NaOH gives  
compound P as a major product. The mass  
percentage of carbon in P is \_\_\_\_\_.  
(to the nearest integer)

(Atomic mass : C = 12; H = 1; O = 16)

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Range**

**Text Areas : PlainText**

**Possible Answers :**

5 to 5.002

**Question Number : 50 Question Id : 40503611580 Question Type : SA Display Question Number : Yes**  
**Correct Marks : 4 Wrong Marks : 0**

क्लोरोफार्म में फीनाल के एक विलयन को जब जलीय NaOH के साथ अभिकृत किया जाता है, तो एक मुख्य उत्पाद P प्राप्त होता है। P में कार्बन की संहति प्रतिशतता है \_\_\_\_\_। (निकटतम पूर्णांक)

(परमाणु द्रव्यमान : C = 12; H = 1; O = 16)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Range

**Text Areas :** PlainText

**Possible Answers :**

5 to 5.002

## Mathematics

<b>Section Id :</b>	405036423
<b>Section Number :</b>	3
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	25
<b>Number of Questions to be attempted :</b>	25
<b>Section Marks :</b>	100
<b>Display Number Panel :</b>	Yes
<b>Group All Questions :</b>	Yes
<b>Mark As Answered Required? :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	405036813
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 51 Question Id : 40503611581 Question Type : MCQ Option Shuffling : Yes**  
**Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option**  
**Orientation : Vertical**

**Correct Marks : 4 Wrong Marks : 1**

For a suitably chosen real constant  $a$ , let a function,  $f : \mathbb{R} - \{-a\} \rightarrow \mathbb{R}$  be defined by

$$f(x) = \frac{a-x}{a+x}. \text{ Further suppose that for any}$$

real number  $x \neq -a$  and  $f(x) \neq -a$ ,

$(f \circ f)(x) = x$ . Then  $f\left(-\frac{1}{2}\right)$  is equal to :