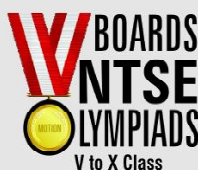


हमारा विश्वास... हर एक विद्यार्थी है खास

**JEE
MAIN
Sept.
2020**

QUESTION PAPER WITH SOLUTION

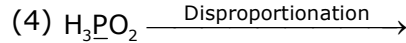
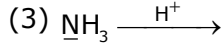
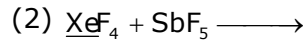
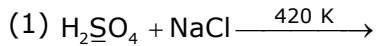
CHEMISTRY _ 4 Sep. _ SHIFT - 2



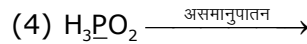
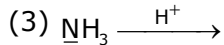
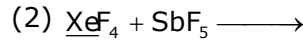
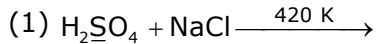
MOTION™

H.O. : 394, Rajeev Gandhi Nagar, Kota
www.motion.ac.in | ✉: info@motion.ac.in

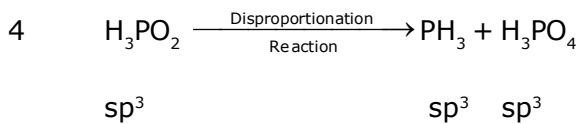
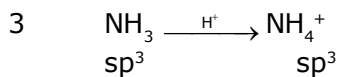
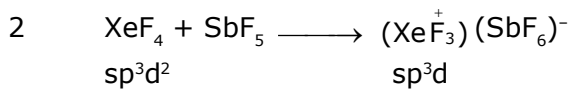
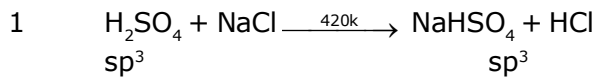
1. The reaction in which the hybridisation of the underlined atom is affected is :



अभिक्रिया जिसमें रेखांकित परमाणु का संकरण प्रभावित होता है, है :

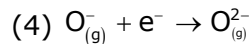
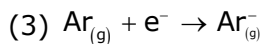
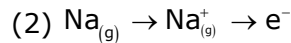
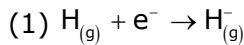


Sol. 2

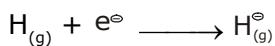


2. The process that is NOT endothermic in nature is :

प्रक्रम जो स्वभावतः ऊष्मा शोषी नहीं है:



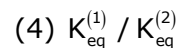
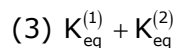
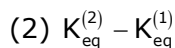
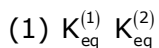
Sol. 1



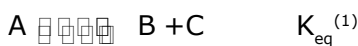
is an exothermic Rxn. Ans (1)

3. If the equilibrium constant for $\text{A} \rightleftharpoons \text{B} + \text{C}$ is $K_{\text{eq}}^{(1)}$ and that of $\text{B} + \text{C} \rightleftharpoons \text{P}$ is $K_{\text{eq}}^{(2)}$, the equilibrium constant for $\text{A} \rightleftharpoons \text{P}$ is :

यदि $\text{A} \rightleftharpoons \text{B} + \text{C}$ के लिए साम्य स्थिरांक $K_{\text{eq}}^{(1)}$ तथा $\text{B} + \text{C} \rightleftharpoons \text{P}$ के लिए वह $K_{\text{eq}}^{(2)}$ है, $\text{A} \rightleftharpoons \text{P}$ के लिए साम्य स्थिरांक है :



Sol. 1



$K_{\text{eq}} = K_{\text{eq}}^{(1)} \times K_{\text{eq}}^{(2)}$ Ans.(1)

CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

◆ Doubt Support ◆ Advanced Level Test Access
 ◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

4. A sample of red ink (a colloidal suspension) is prepared by mixing eosin dye, egg white, HCHO and water. The component which ensures stability of the ink sample is :

- (1) HCHO (2) Water (3) Eosin dye (4) Egg white

लाल स्याही (एक कोलाइडी निलंबन) के एक प्रतिदर्श को इओसिन रंजक, अंडे का सफेद भाग, HCHO तथा जल को मिश्रित करके बनाया जाता है। स्याही प्रतिदर्श के स्थायित्व को सुनिश्चित करने वाला जो घटक है, वह है :

- (1) HCHO (2) जल (3) इओसिन रंजक (4) अंडे का सफेद भाग

Sol. 4

Surface theoretical eggwhite

5. The one that can exhibit highest paramagnetic behaviour among the following is :

gly = glycinato; bpy = 2, 2'-bipyridine

निम्नलिखित में से वह जो सबसे अधिक अनुचुंबकीय व्यवहार प्रदर्शित करता है, है :

gly = ग्लाइसिनेटो ; bpy = 2, 2'-बाईपिरिडीन

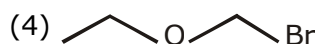
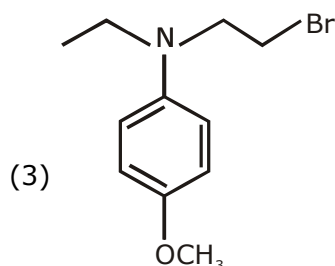
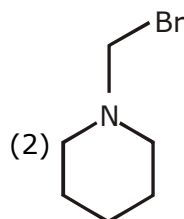
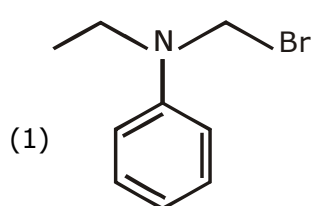
- (1) $[\text{Ti}(\text{NH}_3)_6]^{3+}$ (2) $[\text{Co}(\text{OX})_2(\text{OH})_2]^-$
 (3) $[\text{Pd}(\text{gly})_2]$ (4) $[\text{Fe}(\text{en})(\text{bpy})(\text{NH}_3)_2]^{2+}$

Sol. 2

- $[\text{Ti}(\text{NH}_3)_6]^{3+} \Rightarrow \text{Ti}^{3+} (3d^1) \Rightarrow \mu = \sqrt{3}$
- $[\text{Co}(\text{OX})_2(\text{OH})_2]^- (\Delta_0 > P) \Rightarrow \text{Co}^{+5} (3d^4) \Rightarrow t_2g^4 e_g^0$
 $n = 2, \mu = \sqrt{8}$
- $[\text{Pd}(\text{gly})_2] \Rightarrow \text{Pd}^{2+} (4d^8) \rightarrow \text{Square planar}$
 $n = 0, \mu = 0$ diamagnetic
- $[\text{Fe}(\text{en})(\text{bpy})(\text{NH}_3)_2]^{2+}$
 $\text{Fe}^{2+} \Rightarrow 3d^6 (t_2g^6 e_g^0) \Rightarrow n = 0, \mu = 0$

6. Which of the following compounds will form the precipitate with aq. AgNO_3 solution most readily?

निम्नलिखित यौगिकों में से कौन जलीय AgNO_3 विलयन के साथ सबसे शीघ्रतापूर्वक अवक्षेप देगा ?



CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

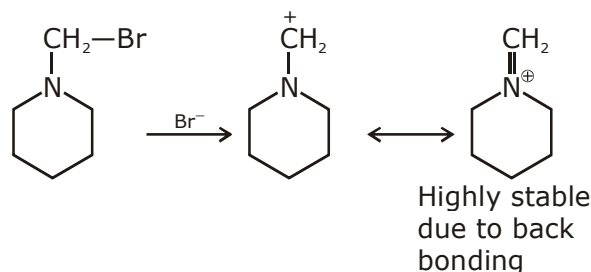
Go Premium at ₹ 1100

- ◆ Doubt Support ◆ Advanced Level Test Access
- ◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

Sol. 2

Rate of reaction \propto stability of carbocation.



7. Five moles of an ideal gas at 1 bar and 298 K is expanded into vacuum to double the volume. The work done is :

- (1) zero (2) $C_v (T_2 - T_1)$ (3) $-RT(V_2 - V_1)$ (4) $-RT \ln V_2/V_1$

एक आदर्श गैस के पाँच मोल को 1 bar तथा 298 K पर निर्वात में उसके आयतन के दुगुने तक प्रसारित किया गया । किया गया कार्य है :

- (1) शून्य (2) $C_v (T_2 - T_1)$ (3) $-RT(V_2 - V_1)$ (4) $-RT \ln V_2/V_1$

Sol. 1

As it is free expansion against zero ext. pressure

\therefore Work Done = zero Ans. (1)

8. 250 mL of a waste solution obtained from the workshop of a goldsmith contains 0.1 M AgNO_3 and 0.1 M AuCl . The solution was electrolyzed at 2 V by passing a current of 1 A for 15 minutes. The metal/metals electrodeposited will be:

$$(E_{\text{Ag}^+/\text{Ag}}^0 = 0.80 \text{ V}, E_{\text{Au}^+/\text{Au}}^0 = 1.69 \text{ V})$$

- (1) Silver and gold in proportion to their atomic weights
(2) Silver and gold in equal mass proportion
(3) only silver
(4) only gold

एक सुनार की कार्यशाला से प्राप्त एक अपशिष्ट विलयन के 250 mL में 0.1 M AgNO_3 तथा 0.1 M AuCl हैं। इस विलयन को 2 V पर एक 1 A की विद्युत धारा 15 मिनट तक प्रवाहित करके वैद्युत अपघटित किया गया। धातु/धातुएँ जो वैद्युत निक्षेपित होंगी/होंगे, है/हैं :

$$(E_{\text{Ag}^+/\text{Ag}}^0 = 0.80 \text{ V}, E_{\text{Au}^+/\text{Au}}^0 = 1.69 \text{ V})$$

- (1) चांदी तथा सोना, उनके परमाणु भार के समानुपात में
(2) चांदी तथा सोना समान संहति के समानुपात में
(3) मात्र चांदी
(4) मात्र सोना

Sol. 1

Here current is same. Both metals are univalent and of same concentrations. So, Both will be deposited in proportions of their equivalent weight or atomic weight.

CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

- ◆ Doubt Support ◆ Advanced Level Test Access
◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

9. The mechanism of action of "Terfenadine" (Seldane) is :
 (1) Helps in the secretion of histamine (2) Activates the histamine receptor
 (3) Inhibits the secretion of histamine (4) Inhibits the action of histamine receptor

"टरफेनाडीन" (सेल्डेन) के कार्य करने की क्रियाविधि है :

- (1) हिस्टैमिन के स्राव में सहायता करता है। (2) हिस्टैमिन-अभिग्राही को सक्रिय करता है।
 (3) हिस्टैमिन के स्राव को निरोधित करता है। (4) हिस्टैमिन-अभिग्राही की क्रिया को निरोधित करता है।

Sol. 4

The mechanism of action of "Terfenadine" (Seldane) is to inhibit the action of histamine receptor.

10. The shortest wavelength of H atom in the Lyman series is λ_1 . The longest wavelength in the Balmer series of He⁺ is :

H परमाणु का सबसे छोटा तरंगदैर्घ्य लाइमैन श्रेणी में λ_1 है। He⁺ का बामर श्रेणी में सबसे लम्बा तरंगदैर्घ्य है :

- (1) $\frac{9\lambda_1}{5}$ (2) $\frac{27\lambda_1}{5}$ (3) $\frac{36\lambda_1}{5}$ (4) $\frac{5\lambda_1}{9}$

Sol. 1

$$\frac{1}{\lambda_1} = R_4 \times (1)^2 \times \left\{ 1 - \frac{1}{\infty^2} \right\} = R_H$$

$$\frac{1}{\lambda_2} = R_4 \times (2)^2 \times \left\{ \frac{1}{4} - \frac{1}{9} \right\} = R_H \left\{ \frac{5}{9} \right\}$$

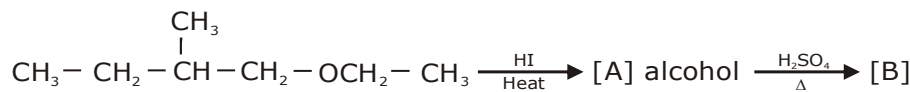
$$\frac{\lambda_2}{\lambda_1} = \frac{9}{5}$$

$$\lambda_2 = \frac{9}{5} \lambda_1$$

Ans. (1)

11. The major product [B] in the following reactions is :

निम्नलिखित अभिक्रियाओं में मुख्य उत्पाद [B] है :



CRASH COURSE
FOR JEE ADVANCED 2020

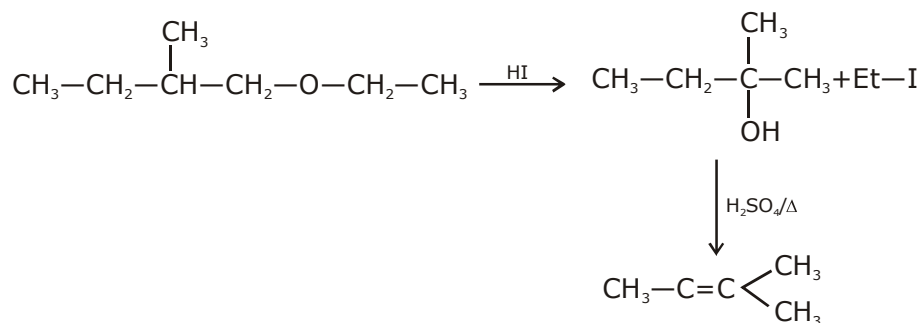
FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

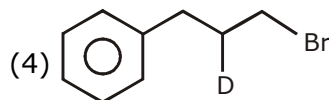
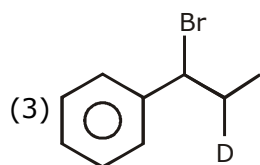
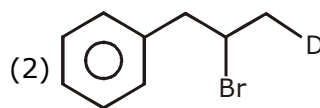
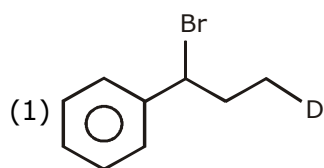
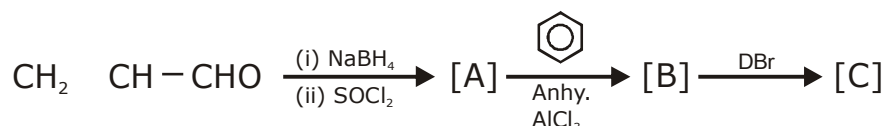
- ◆ Doubt Support ◆ Advanced Level Test Access
- ◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

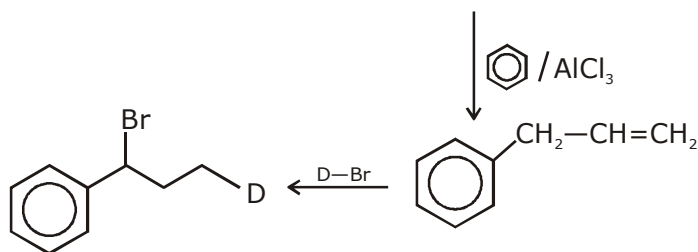
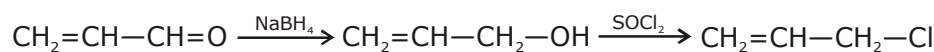
Sol. 3



12. The major product [C] of the following reaction sequence will be :
निम्नलिखित अभिक्रिया-अनुक्रम में मुख्य उत्पाद [C] है:



Sol. 1



CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

◆ Doubt Support ◆ Advanced Level Test Access
◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

13. The Crystal Field Stabilization Energy (CFSE) of $[\text{CoF}_3(\text{H}_2\text{O})_3]$ ($\Delta_0 < P$) is:

$[\text{CoF}_3(\text{H}_2\text{O})_3]$ की क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा (CFSE) ($\Delta_0 < P$) है :

- (1) $-0.8 \Delta_0$ (2) $-0.8 \Delta_0 + 2P$ (3) $-0.4 \Delta_0 + P$ (4) $-0.4 \Delta_0$

Sol. 4

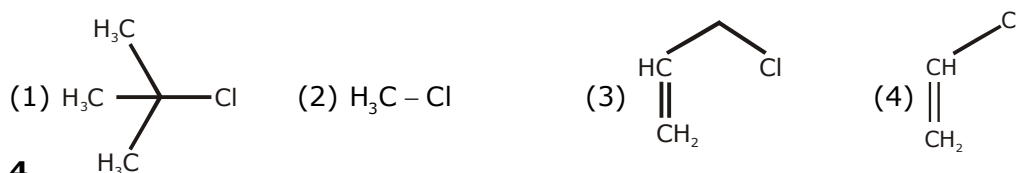
$[\text{CoF}_3(\text{H}_2\text{O})_3]$ ($\Delta_0 < P$)
 $\text{CO}^{3+} (3d^6) = t_2g^4 e_g^2$

$$\text{CFSE} = \left(-\frac{2}{5} \times 4 + \frac{3}{5} \times 2 \right) \Delta_0$$

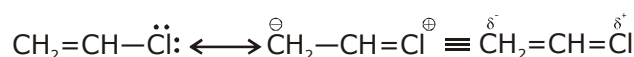
$$= -0.4 \Delta_0$$

14. Among the following compounds, which one has the shortest C - Cl bond?

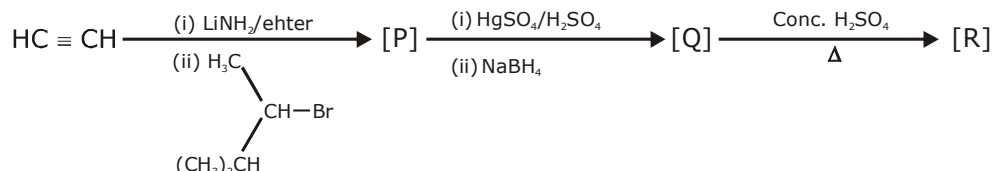
निम्नलिखित यौगिकों में से किसमें C - Cl आबंध सबसे छोटा है?



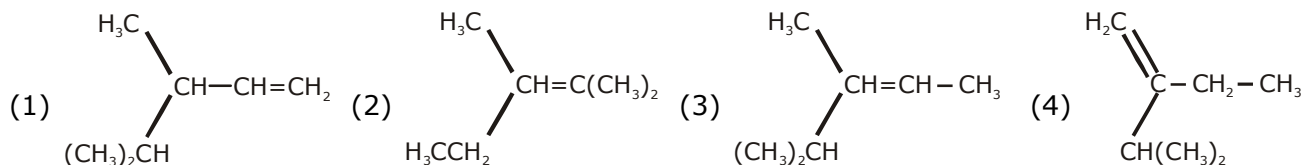
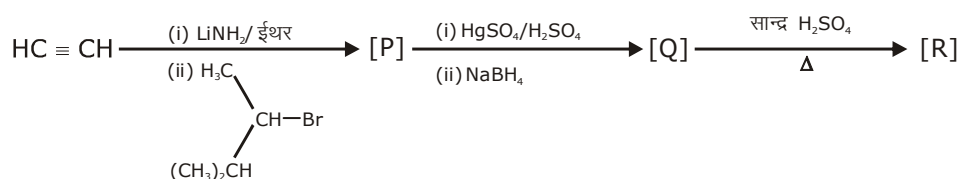
Sol. 4



15. The major product [R] in the following sequence of reactions is :



निम्नलिखित अभिक्रिया-अनुक्रम में मुख्य उत्पाद [R] है :



Sol. 2

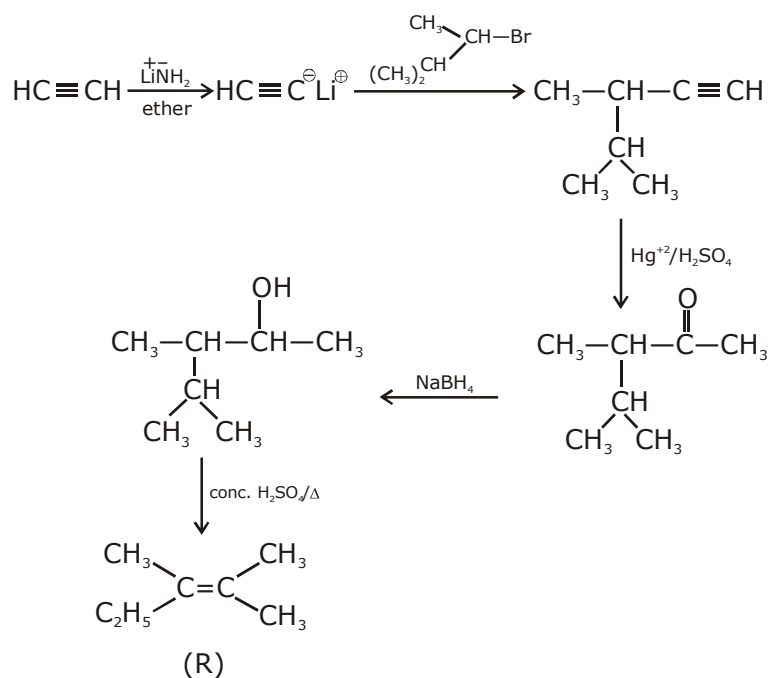
CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on 

Go Premium at ₹ 1100

- ◆ Doubt Support ◆ Advanced Level Test Access
- ◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**



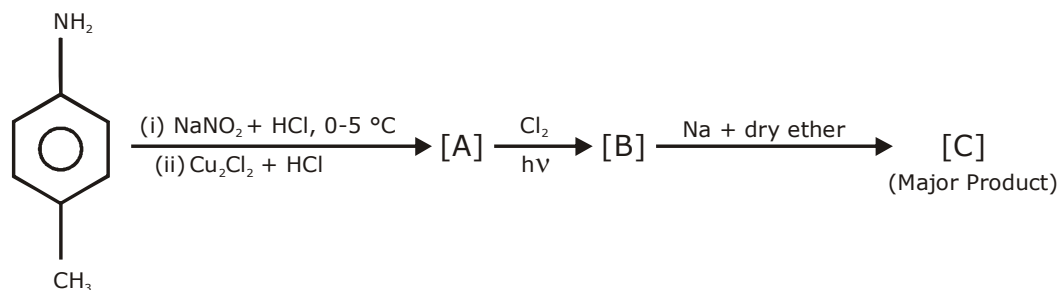
16. The molecule in which hybrid AOs involve only one d-orbital of the central atom is :
अणु, जिसके संकरित MO में केन्द्रीय परमाणु के मात्र एक d-कक्षक सम्मिलित हैं, है:



Sol. 4

- (1) $(\text{CrF}_6)^{3-} - d^2\text{sp}^3$
 (2) $\text{XeF}_4 - \text{sp}^3d^2$
 (3) $\text{BrF}_5 - \text{sp}^3d^2$
 (4) $[\text{Ni}(\text{CN})_4]^{2-} \rightarrow \text{dsp}^2$

17. In the following reaction sequence, [C] is :



CRASH COURSE
FOR JEE ADVANCED 2020

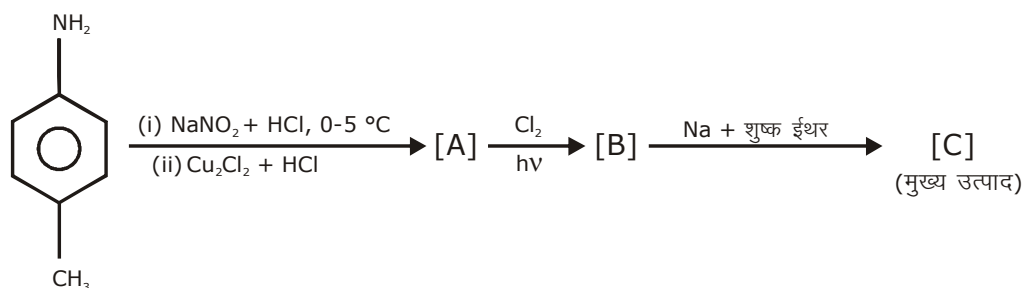
FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

- ◆ Doubt Support ◆ Advanced Level Test Access
- ◆ Live Test Paper Discussion ◆ Final Revision Exercises

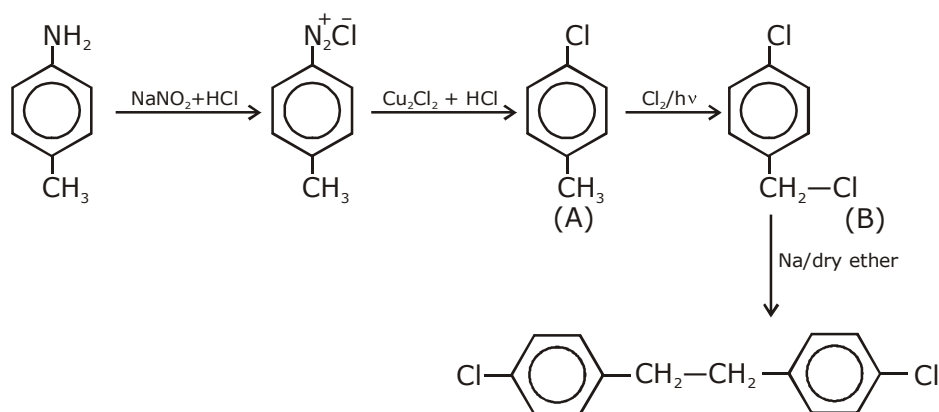
Start Date: **07 Sept. 2020**

निम्नलिखित अभिक्रिया अनुक्रम में, [C] है :



- (1)
- (2)
- (3)
- (4)

Sol. 3



CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

◆ Doubt Support ◆ Advanced Level Test Access
◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: 07 Sept. 2020

- 18.** The processes of calcination and roasting in metallurgical industries, respectively, can lead to :
- (1) Photochemical smog and ozone layer depletion
 - (2) Photochemical smog and global warming
 - (3) Global warming and photochemical smog
 - (4) Global warming and acid rain

धातुकर्मीय उद्योग में, निस्तापन तथा भर्जन के प्रक्रम क्रमशः पैदा करते हैं :

- (1) प्रकाश रासायनिक धूमकुहा तथा ओजोन परत का अवक्षय
- (2) प्रकाश रासायनिक धूमकुहा तथा वैश्विक तापन
- (3) वैश्विक तापन तथा प्रकाश रासायनिक धूमकुहा
- (4) वैश्विक तापन तथा अम्ल वर्षा

Sol. 4

Environmental

Calcination Releases \rightarrow $\text{CO}_2 \rightarrow$ Global warming

Roasting Releases \rightarrow $\text{SO}_2 \rightarrow$ Acid Rain

Ans. (4)

- 19.** The incorrect statement(s) among (a) - (c) is (are) :
- (a) W(VI) is more stable than Cr(VI).
 - (b) in the presence of HCl, permanganate titrations provide satisfactory results.
 - (c) some lanthanoid oxides can be used as phosphors.

- (1) (a) only
- (2) (b) and (c) only
- (3) (a) and (b) only
- (4) (b) only

कथनों (a) - (c) में से गलत कथन है/हैं:

- (a) Cr(VI) की अपेक्षा W(VI) अधिक स्थायी है।
- (b) HCl की उपस्थिति में, परमैंगनेट अनुमापन संतोषप्रद परिणाम देते हैं।
- (c) कुछ लैन्थेनायड आक्साइडों को फॉस्फरों की तरह उपयोग में ला सकते हैं।

- (1) (a) मात्र
- (2) (b) तथा (c) मात्र
- (3) (a) तथा (b) मात्र
- (4) (b) मात्र

Sol. 4

Fact

- 20.** An alkaline earth metal 'M' readily forms water soluble sulphate and water insoluble hydroxide. Its oxide MO is very stable to heat and does not have rock-salt structure. M is :

एक क्षारीय मृदा धातु 'M' शीघ्रतापूर्वक जल-विलेय सल्फेट तथा जल-अविलेय हाइड्राक्साइड बनाती है। इसकी आक्साइड MO ऊष्मा के प्रति अतिस्थायी है तथा खनिज नमक संरचना में नहीं होती है। M है :

- (1) Ca
- (2) Be
- (3) Mg
- (4) Sr

Sol. 2

Fact

CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

- ◆ Doubt Support ◆ Advanced Level Test Access
- ◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

- 21.** The osmotic pressure of a solution of NaCl is 0.10 atm and that of a glucose solution is 0.20 atm. The osmotic pressure of a solution formed by mixing 1 L of the sodium chloride solution with 2 L of the glucose solution is $x \times 10^{-3}$ atm. x is _____. (nearest integer)

NaCl के एक विलयन का परासरण दाब 0.10 atm है तथा ग्लूकोस के एक विलयन का परासरण दाब 0.20 atm है। सोडियम क्लोराइड के विलयन के 1 L को ग्लूकोस के विलयन के 2 L में मिलाकर बनाये गये विलयन का परासरण दाब है $x \times 10^{-3}$ atm. x है _____. (निकटतम पूर्णांक)

Sol. 167

$$\frac{0.1 \times 1 + 0.2 \times 2}{3}$$

$$= \frac{0.5}{3} = \frac{500}{3} \times 10^{-3} = 167 \text{ Ans.}$$

- 22.** The number of molecules with energy greater than the threshold energy for a reaction increases five fold by a rise of temperature from 27 °C to 42 °C. Its energy of activation in J/mol is _____. (Take $\ln 5 = 1.6094$; $R = 8.314 \text{ J mol}^{-1}\text{K}^{-1}$)

एक अभिक्रिया में, अणुओं, जिनकी ऊर्जा, देहली ऊर्जा की अपेक्षा अधिक है, उसकी संख्या ताप के 27 °C से 42 °C तक बढ़ने से पाँच गुना बढ़ जाती है। इसकी सक्रियण ऊर्जा (J/mol में) हैं _____। (मानें, $\ln 5 = 1.6094$; $R = 8.314 \text{ J mol}^{-1}\text{K}^{-1}$)

Sol. 84297.47

$$\frac{1}{5} = \frac{e^{-E_a/300R}}{e^{-E_a/315R}}$$

$$5 = e^{\frac{E_a}{R} \left(\frac{1}{300} - \frac{1}{315} \right)}$$

$$\frac{E_a}{R} \left(\frac{15}{300 \times 315} \right) = \ln(5)$$

$$E_a = 1.6094 \times 315 \times 20 \times 8.314$$

$$E_a = 84297.47 \text{ J/mol Ans.}$$

- 23.** A 100 mL solution was made by adding 1.43 g of $\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$. The normality of the solution is 0.1 N. The value of x is _____. (The atomic mass of Na is 23 g/mol).

$\text{Na}_2\text{CO}_3 \cdot x\text{H}_2\text{O}$ के 1.43 g को मिलाकर 100 mL का एक विलयन बनाया गया। विलयन की नार्मलिटी 0.1 N है। x का मान है _____। (Na की परमाणु संहति 23 g/mol है)

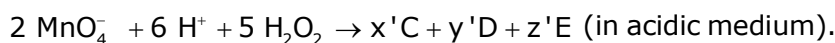
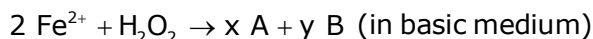
Sol. 10

$$\frac{0.1}{2} \times \frac{100}{1000} = \frac{1.43}{160 + 18x}$$

$$106 + 18x = 286$$

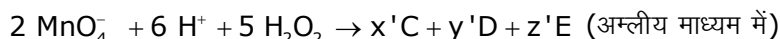
$$18x = 180 \Rightarrow x = 10 \text{ Ans.}$$

24. Consider the following equations :



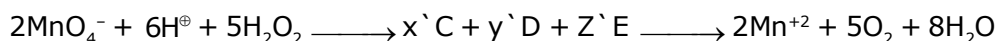
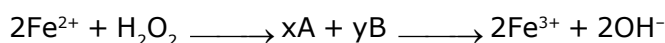
The sum of the stoichiometric coefficients x , y , x' , y' and z' for products A, B, C, D and E, respectively, is _____.

निम्नलिखित समीकरणों पर विचार कीजिए :



A, B, C, D तथा E उत्पादों के लिए क्रमशः स्टाइकियोमित्री गुणांकों x , y , x' , y' तथा z' का योग है _____।

Sol. 19



$$x = 2 ; y = 2 ; x' = 2, y' = 5, z' = 8$$

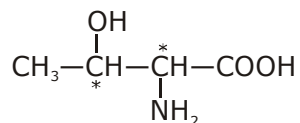
$$2 + 2 + 2 + 5 + 8 = 19$$

Ans. 19

25. The number of chiral centres present in threonine is _____.

थ्रिऑनीन में उपस्थित काइरल केन्द्रों की संख्या है _____।

Sol. 2



CRASH COURSE
FOR JEE ADVANCED 2020

FREE Online Lectures Available on YouTube

Go Premium at ₹ 1100

◆ Doubt Support ◆ Advanced Level Test Access
◆ Live Test Paper Discussion ◆ Final Revision Exercises

Start Date: **07 Sept. 2020**

Admission
OPEN

जब इन्होंने पूरा किया अपना सपना
तो आप भी पा सकते है लक्ष्य अपना

JEE MAIN RESULT 2019



Nitin Gupta

Marks
335
13th (2019)

Marks
149
12th (2018)



Shiv Modi

Marks
318
13th (2019)

Marks
153
12th (2018)



Ritik Bansal

Marks
308
13th (2019)

Marks
218
12th (2018)



Shubham Kumar

Marks
300
13th (2019)

Marks
153
12th (2018)

KOTA'S PIONEER IN DIGITAL EDUCATION

1,95,00,000+ viewers | **72,67,900+** viewing hours | **2,11,000+** Subscribers

SERVICES	SILVER	GOLD	PLATINUM
Classroom Lectures (VOD)			
Live interaction	NA		
Doubt Support	NA		
Academic & Technical Support	NA		
Complete access to all content	NA		
Classroom Study Material	NA		
Exercise Sheets	NA		
Recorded Video Solutions	NA		
Online Test Series	NA		
Revision Material	NA		
Upgrade to Regular Classroom program	Chargeable	Chargeable	Free
Physical Classroom	NA	NA	
Computer Based Test	NA	NA	
Student Performance Report	NA	NA	
Workshop & Camp	NA	NA	
Motion Solution Lab- Supervised learning and instant doubt clearance	NA	NA	
Personalised guidance and mentoring	NA	NA	

FEE STRUCTURE

CLASS	SILVER	GOLD	PLATINUM
7th/8th	FREE	₹ 12,000	₹ 35,000
9th/10th	FREE	₹ 15,000	₹ 40,000
11th	FREE	₹ 29,999	₹ 49,999
12th	FREE	₹ 39,999	₹ 54,999
12th Pass	FREE	₹ 39,999	₹ 59,999

+ Student Kit will be provided at extra cost to Platinum Student.

- * **SILVER (Trial)** Only valid 7 DAYS or First 10 Hour's Lectures.
- ** **GOLD (Online)** can be converted to regular classroom (Any MOTION Center) by paying difference amount after lockdown.
- *** **PLATINUM (Online + Regular)** can be converted to regular classroom (Any MOTION Center) without any cost after lockdown.

New Batch Starting from :
16 & 23 September 2020

Zero Cost EMI Available

MOTION™

H.O. : 394, Rajeev Gandhi Nagar, Kota
www.motion.ac.in | ✉ : info@motion.ac.in