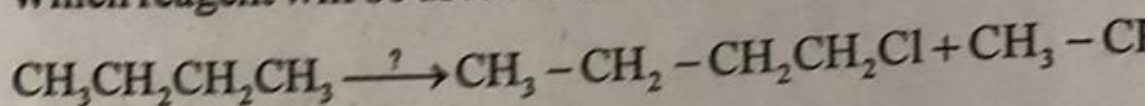


# CHEMISTRY

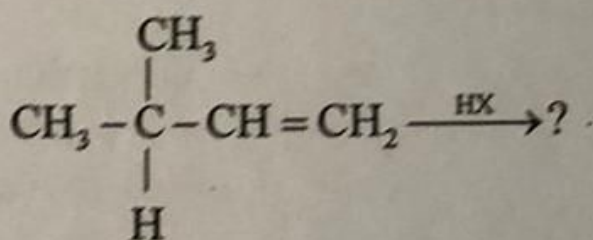
- 41) In the complex  $K[Cr(H_2O)_2(C_2O_4)_2] \cdot 3H_2O$ , oxidation state number of the central metal ion is \_\_\_\_\_ and \_\_\_\_\_.
- (A) +4, 4  
 (B) +3, 4  
 (C) +4, 6  
 (D) +3, 6

- 42) Which reagent will be used for the following reaction?



- (A)  $Cl_2$ , air, Fe/dark  
 (B)  $NaCl + H_2SO_4$   
 (C)  $Cl_2$ /UV light  
 (D)  $Cl_2$ , air/dark

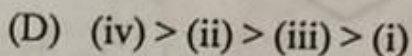
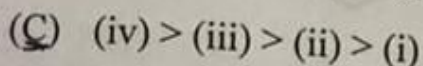
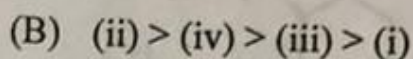
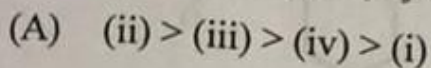
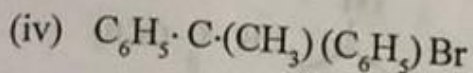
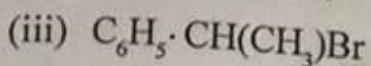
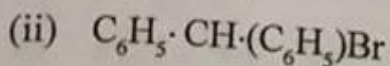
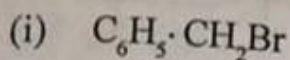
- 43) What is the major product in the following reaction?



- (A)  $CH_2 - \overset{\overset{CH_3}{|}}{C} - CH_2 - CH_3$   
 | |  
 X H
- (B)  $CH_3 - \overset{\overset{CH_3}{|}}{C} - CH_2$   
 |  
 X
- (C)  $CH_3 - \overset{\overset{CH_3}{|}}{C} - CH_2 - CH_2$   
 | |  
 H X
- (D)  $CH_3 - \overset{\overset{CH_3}{|}}{C} - CH -$   
 | |  
 H X

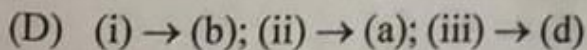
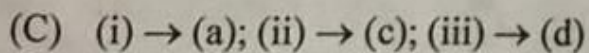
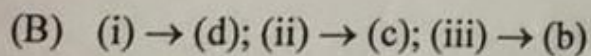
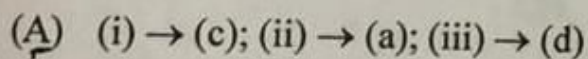
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44) Predict the order of reactivity of the following compounds in  $S_N1$  reaction.



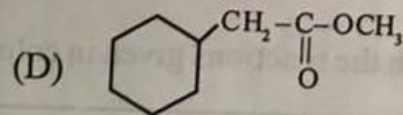
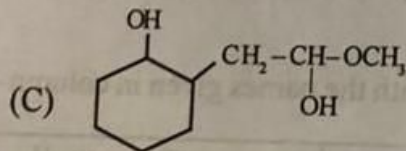
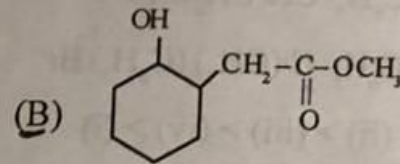
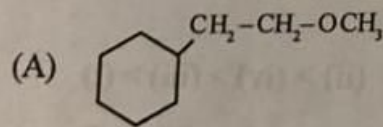
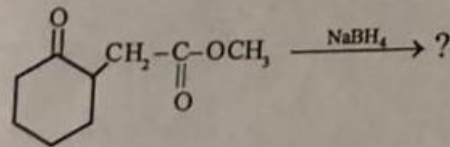
45) Match the reactions given in column - I with the names given in column - II.

Column - I	Column - II
i) $R-Cl + NaI \xrightarrow[\text{acetone}]{\text{dry}} R-I + NaCl$	a) Swarts reaction
ii) $CH_3-Br + AgF \xrightarrow{\Delta} CH_3-F + AgBr$	b) Wurtz reaction
iii) $R-X + Mg \xrightarrow[\text{ether}]{\text{dry}} R-Mg-X$ $\downarrow H_2O$ $RH + Mg(OH)X$	c) Finkelstein reaction d) Grignard reaction

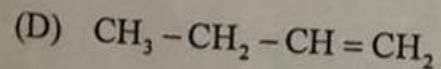
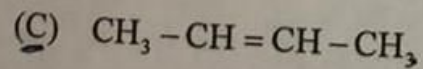
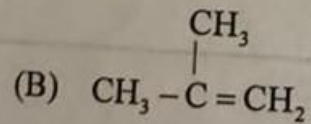
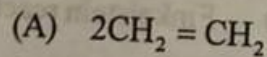


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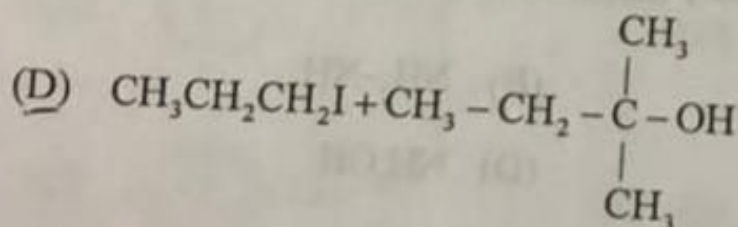
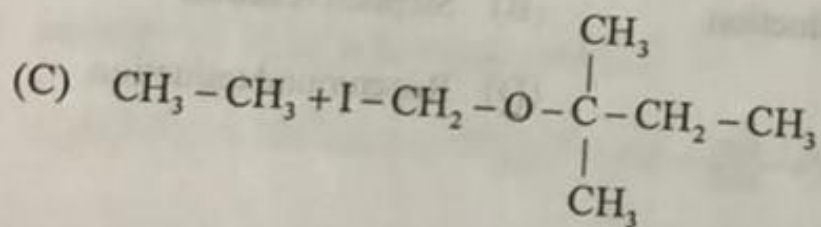
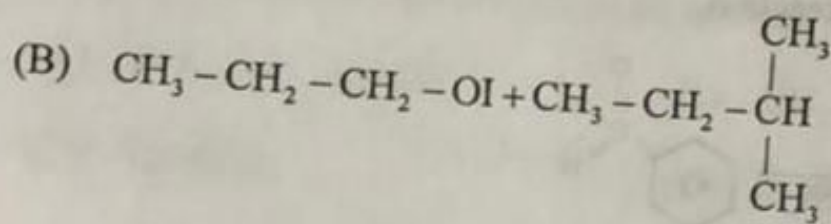
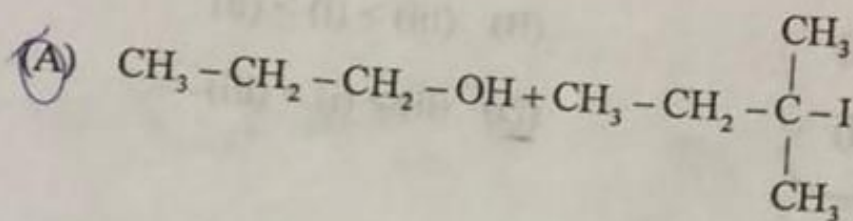
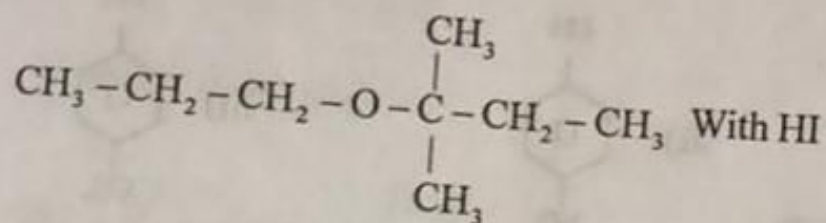
46) Which product will be obtained in the following reaction \_\_\_\_\_.



47) Predict the major product of acid catalysed dehydration of butan-1-ol.

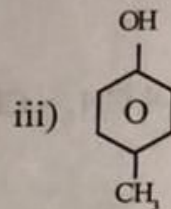
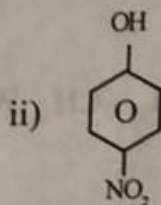
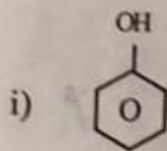


48) Give the major product formed by heating



(Space for Rough Work)

49) Arrange the following compounds in decreasing order of their acidic strength



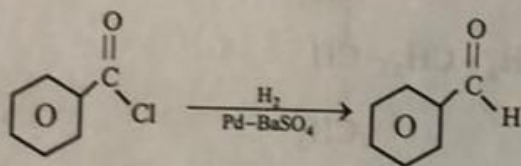
(A) (ii) > (iii) > (i)

(B) (iii) > (i) > (ii)

(C) (i) > (ii) > (iii)

(D) (ii) > (i) > (iii)

50) Name the following reaction.



(A) Clemmensen reduction

(B) Stephen reaction

(C) Etard reaction

(D) Rosenmund reduction

51) 'R' +  $\text{CH}_3 - \text{CO} - \text{CH}_3 \xrightarrow{\text{H}^+}$  Schiff's base what is 'R' in this reaction?

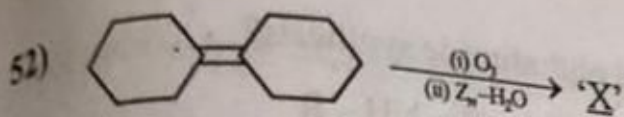
(A)  $\text{C}_6\text{H}_5 - \text{NH} - \text{NH}_2$

(B)  $\text{NH}_2 - \text{NH}_2$

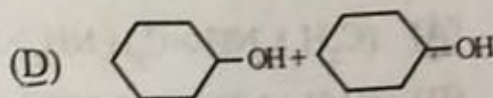
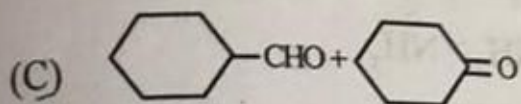
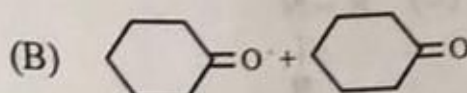
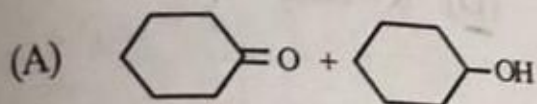
(C)  $\text{CH}_3 - \text{NH}_2$

(D)  $\text{NH}_2\text{OH}$

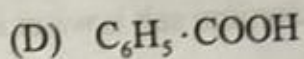
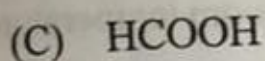
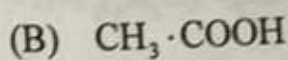
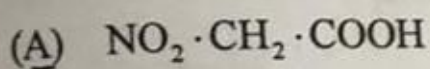
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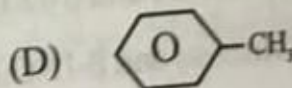
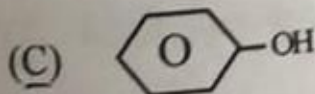
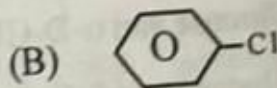
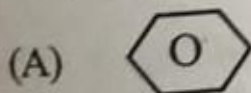
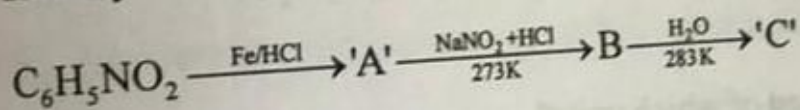
What is X in this reaction?



53) Which of the following carboxylic acid has least pKa value among all?

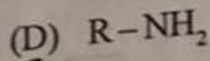
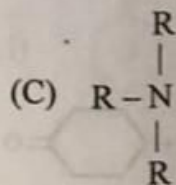
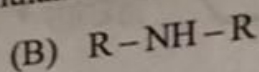
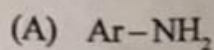


54) Identify 'C' in the following reaction.

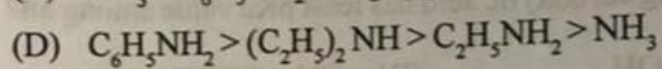
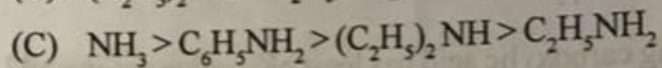
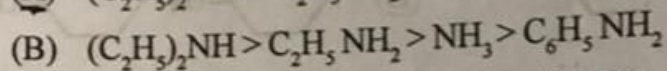
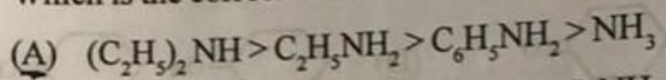


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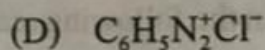
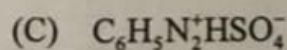
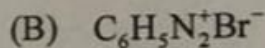
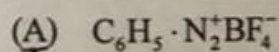
55) Which amine is prepared by Gabriel phthalimide synthesis?



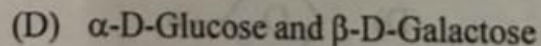
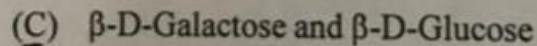
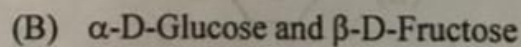
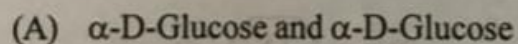
56) Which is the correct order of the basic strength of given amines?



57) Which diazonium salt is water insoluble and stable at room temperature?

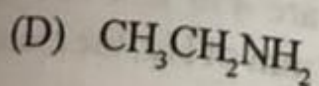
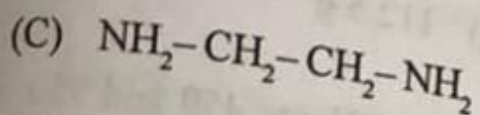
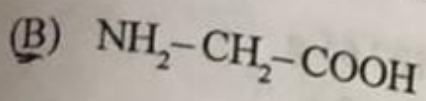
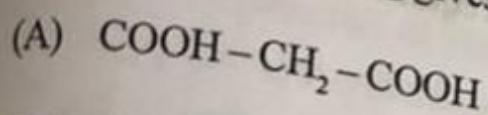


58) Lactose is composed of which units?



(Space for Rough Work)

59) Which of the following gives Zwitter ion in its aqueous solution?



60) Deficiency of which vitamin is responsible for RBC deficient in haemoglobin?

(A) Vitamin B<sub>12</sub>

(B) Vitamin B<sub>6</sub>

(C) Vitamin B<sub>2</sub>

(D) Vitamin B<sub>1</sub>

61) Which of the following statement is incorrect for the structure of Nucleic acids?

(A) Nucleotides are joined together by phosphodiester linkage

(B) In DNA molecule, the sugar moiety is  $\beta$ -D-2-deoxyribose

(C) A unit formed by the attachment of a base 1' position of sugar is known as nucleoside

(D) RNA contains four bases adenine, guanine, cytosine and thymine

(Space for Rough Work)



62) Calculate the mass of Glucose ( $C_6H_{12}O_6$ ) required in making 2.5 kg of 0.25 molal aqueous solution.

[Atomic wt : H = 1, O = 16, C = 12 amu]

- (A) 135.0 g (B) 107.65 g  
(C) 90.0 g (D) 112.5 g

63) The vapour pressure of pure liquids 'P' and 'Q' are 450 and 750 mm of Hg respectively at 350 K. If total vapour pressure is 600 mm of Hg, the mole fractions of 'P' and 'Q' respectively will be \_\_\_\_\_ and \_\_\_\_\_.

- (A) 0.7 and 0.3 (B) 0.4 and 0.6  
(C) 0.6 and 0.4 (D) 0.5 and 0.5

64) The freezing point depression of 645 g of aqueous solution of ethylene glycol ( $C_2H_6O_2$ ) is 2.25 K. Find weight of ethylene glycol in the solution.

[ $K_f = 1.86 \text{ K kg mol}^{-1}$ ; H = 1, C = 12, O = 16 amu]

- (A) 45.0 g (B) 42.50 g  
(C) 48.375 g (D) 50 g

65) Van't Hoff factor (i) for dilute aqueous solution of  $K_4[Fe(CN)_6]$ ,  $Fe_4[Fe(CN)_6]_3$  and  $[CoCl_2(en)_2]Cl_2$  are respectively \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

- (A) 2, 7, 5 (B) 2, 5, 7  
(C) 5, 7, 2 (D) 7, 5, 2

66) Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.

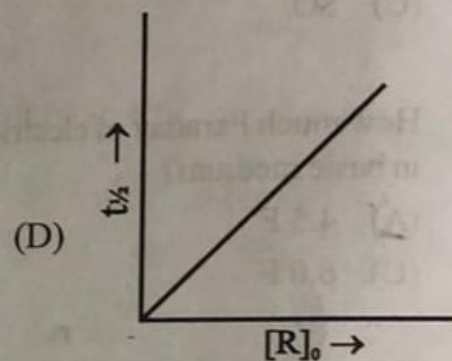
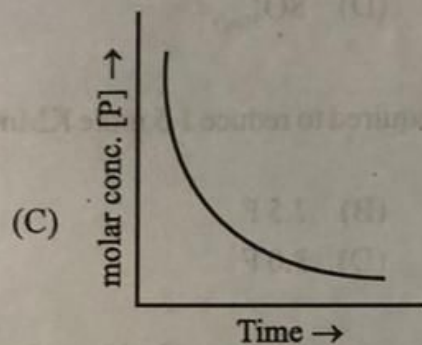
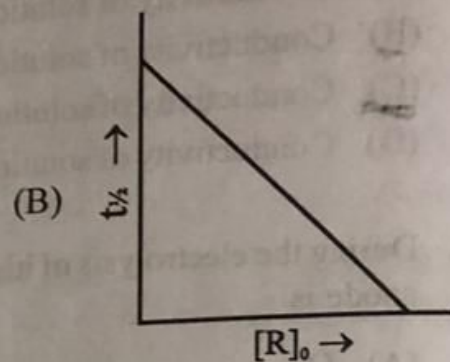
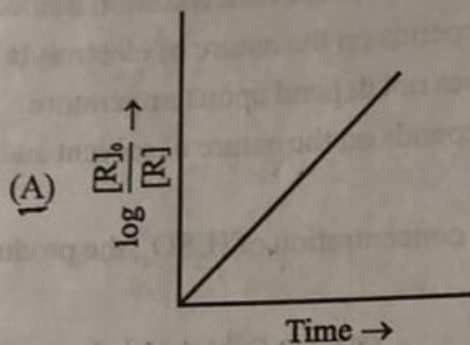
- (A) +0.059 V (B) -0.059 V  
(C) +0.59 V (D) -0.59 V

- 67) Which of the statements for solution of electrolyte is not correct?
- (A) Conductivity of solution depends on the concentration of electrolyte
  - (B) Conductivity of solution depends on the nature of electrolyte
  - (C) Conductivity of solution does not depend upon temperature
  - (D) Conductivity of solution depends on the nature of solvent and its viscosity
- 68) During the electrolysis of higher concentration of  $\text{H}_2\text{SO}_4$ , the product obtained at anode is \_\_\_\_\_.
- (A)  $\text{O}_{2(g)}$
  - (B)  $\text{S}_2\text{O}_8^{2-}(aq)$
  - (C)  $\text{SO}_{2(g)}$
  - (D)  $\text{SO}_3^{2-}(aq)$
- 69) How much Faraday of electricity is required to reduce 1.5 mole  $\text{KMnO}_4$  into  $\text{MnO}_2$  in basic medium?
- (A) 4.5 F
  - (B) 7.5 F
  - (C) 6.0 F
  - (D) 3.0 F
- 70) For any reaction the rate constant  $K = 2.3 \times 10^{-5} \text{ mol}^{-3/2} \text{ L}^{3/2} \text{ S}^{-1}$ ; then the order of reaction will be \_\_\_\_\_.
- (A) 0.0 (zero)
  - (B) 1.5
  - (C) 0.5
  - (D) 2.5
- 71) Which of the following statements is incorrect for a reaction carried out in presence of catalyst?
- (A) Potential energy of reactants and products change
  - (B) Equilibrium constant of the reaction does not change
  - (C) There is no change in Gibbs energy of the reaction
  - (D) The activation energy of the reaction decreases

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(Space for Rough Work)

72) Which of the following graphs is correct for a first order reaction  $R \rightarrow P$ ?



73) Reaction  $2A \rightarrow B + 3C$  is zero order reaction. If  $K = 3.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$ ; What will be the rate of production of 'C'?

- (A)  $1.167 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$       (B)  $10.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$   
 (C)  $3.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$       (D)  $7.0 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$

74)  $\text{KMnO}_4$  acts as an oxidising agent in acidic medium. The number of moles of  $\text{KMnO}_4$  that will be needed to react with one mole of sulphide ion in acidic solution is \_\_\_\_\_.

- (A) 1/5  
 (C) 4/5  
 (B) 3/5  
 (D) 2/5

75) Which one of the following is amphoteric oxide?

- (A)  $\text{V}_2\text{O}_3$   
 (C)  $\text{Cr}_2\text{O}_3$   
 (B)  $\text{CrO}$   
 (D)  $\text{CrO}_3$

76) Which of the following ion show highest spin only magnetic moment value?

- (A)  $\text{Co}^{2+}$   
 (C)  $\text{Ti}^{2+}$   
 (B)  $\text{Mn}^{2+}$   
 (D)  $\text{Fe}^{2+}$

77) Name the member of lanthanide series which is well known to exhibit +4 oxidation state?

- (A) Cerium  
 (C) Gadolinium  
 (B) Thulium  
 (D) Samarium

78) Which one is the correct formula for coordination compound tris [ethane -1, 2- diamine] cobalt (III) sulphate

- (A)  $[\text{Co}(\text{en})_3]_3(\text{SO}_4)_2$   
 (C)  $[\text{Co}(\text{en})_3](\text{SO}_4)_2$   
 (B)  $[\text{Co}(\text{en})_3]_2(\text{SO}_4)_3$   
 (D)  $[\text{Co}(\text{en})_3]\text{SO}_4$

79) Hybridizations in  $[\text{Ni}(\text{CO})_4]$  and  $[\text{Ni}(\text{CN})_4]^{-2}$  are respectively \_\_\_\_\_.

- (A)  $\text{sp}^3$  and  $\text{dsp}^2$   
 (C)  $\text{dsp}^2$  and  $\text{sp}^3$   
 (B)  $\text{sp}^3$  and  $\text{sp}^3$   
 (D)  $\text{dsp}^2$  and  $\text{dsp}^2$

80) Identify the optically active compound from the following.

- (A)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$   
 (C)  $[\text{Co}(\text{en})_3]\text{Cl}_3$   
 (B)  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_2$   
 (D)  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}$

(Space for Rough Work)

