



CHEMISTRY CLASS - XII

Date 09-05-2010

Duration : 1 Hours

Max. Marks : 80

UNIQUE TEST - 1

INSTRUCTIONS

Do not break the seal of the question paper booklet before instructed to do so by the invigilator

Section A contains 15 question and Section-C contains 5 questions and total number of pages are 8. Please ensure that the Questions paper you have received contains ALL THE QUESTIONS in each section and PAGES.

SECTION - A

- Question 1 to Question 8 has four choices (A), (B), (C), (D) out of which **only one is correct** & carry **4 marks** each. 1 mark will be deducted for each wrong answer.
- Question 9 to Question 11 has four choices (A), (B), (C), (D) Out of which **one or more than one is/are correct** and carry **5 marks** each. 2 mark will be deducted for each wrong answer.
- Question 12** is Reasoning type question, contains Statement-1 (Assertion) & Statement-2 (Reason) Questions has 4 choices (A), (B), (C), (D) out of which **only one is correct** & carry **4 marks**, 1 mark will be deducted for wrong answer.
- Question 13 to Question 15 are based upon a **paragraph**. Each Question has 4 choices (A), (B), (C), (D) out of which **only one is correct** & carry **3 marks** each. 1 mark will be deducted for each wrong answer.

SECTION - C

- Questions 1 to Questions 5 are **subjective question** (whose answer are upto 4 digits) & carry **4 marks** each. No negative marking for this section.

NOTE : GENERAL INSTRUCTION FOR FILLING THE OMR ARE GIVEN BELOW.

- Use only **HB pencil** or **blue/black pen** (avoid gel pen) for darkening the bubble.
- Indicate the correct answer for each question by filling appropriate bubble in your OMR answer sheet.
- The Answer sheet will be checked through computer hence, the answer of the question must be marked by shading the circles against the question by dark **HB pencil** or **blue/black pen**.
- While filling the bubbles please be careful about **SECTIONS** [i.e. Section-A include single correct answers, multi correct answers, reasoning type, paragraph type), Section-B (include match the column), Section-C (include subjective answers)].

SECTION-A	SECTION-B	SECTION-C																														
<p>For example if only 'A' choice is correct then, the correct method for filling the bubble is</p> <p>A B C D E ● ○ ○ ○ ○</p> <p>For example if only 'A & C' choices are correct then, the correct method for filling the bubble is</p> <p>A B C D E ● ○ ● ○ ○</p> <p>the wrong method for filling the bubble are</p> <p>⊗ ⊗ ⊗ ⊗ ⊗</p> <p>The answer of the questions in wrong or any other manner will be treated as wrong.</p>	<p>For example If Correct match for (A) is P; for (B) is R, S; for (C) is Q; for (D) is P, Q, S then the correct method for filling the bubble is</p> <table border="0"> <tr><td>A</td><td>●</td><td>○</td><td>○</td><td>○</td><td>○</td></tr> <tr><td>B</td><td>○</td><td>○</td><td>●</td><td>○</td><td>○</td></tr> <tr><td>C</td><td>○</td><td>●</td><td>○</td><td>○</td><td>○</td></tr> <tr><td>D</td><td>●</td><td>●</td><td>○</td><td>●</td><td>○</td></tr> </table>	A	●	○	○	○	○	B	○	○	●	○	○	C	○	●	○	○	○	D	●	●	○	●	○	<p>Ensure that all columns are filled. Answers, having blank column will be treated as incorrect. Insert leading zero(s) if required :</p> <table border="0"> <tr> <td>'6' should be filled as 0006</td> <td>'86' should be filled as 0086</td> <td>'1857' should be filled as 1857</td> </tr> <tr> <td>●●●●○ ①①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥⑥ ⑦⑦⑦⑦ ⑧⑧⑧⑧ ⑨⑨⑨⑨</td> <td>●●●○ ①①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥● ⑦⑦⑦⑦ ⑧⑧●⑧ ⑨⑨⑨⑨</td> <td>○●○●○ ●①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥⑥ ⑦⑦⑦● ⑧●⑧⑧ ⑨⑨⑨⑨</td> </tr> </table>	'6' should be filled as 0006	'86' should be filled as 0086	'1857' should be filled as 1857	●●●●○ ①①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥⑥ ⑦⑦⑦⑦ ⑧⑧⑧⑧ ⑨⑨⑨⑨	●●●○ ①①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥● ⑦⑦⑦⑦ ⑧⑧●⑧ ⑨⑨⑨⑨	○●○●○ ●①①① ②②②② ③③③③ ④④④④ ⑤⑤⑤⑤ ⑥⑥⑥⑥ ⑦⑦⑦● ⑧●⑧⑧ ⑨⑨⑨⑨
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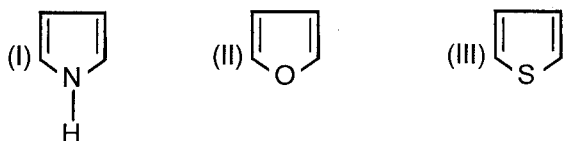
SECTION – A

[STRAIGHT OBJECTIVE TYPE]

Q.1 to 8 has four choices (A), (B), (C), (D) out of which ONLY ONE is correct

1. The lattice energy of KCl is 202 k cal/mole. When KCl is dissolved in water 2 k cal/mole is absorbed. If the solution energies of K^+ & Cl^- are in the ratio of 2 : 3, the enthalpy of hydration of K^+ is :
 (A) -80 kJ/mole (B) -120 kJ/mole (C) -150 kJ/mole (D) 133.3 kJ/mole

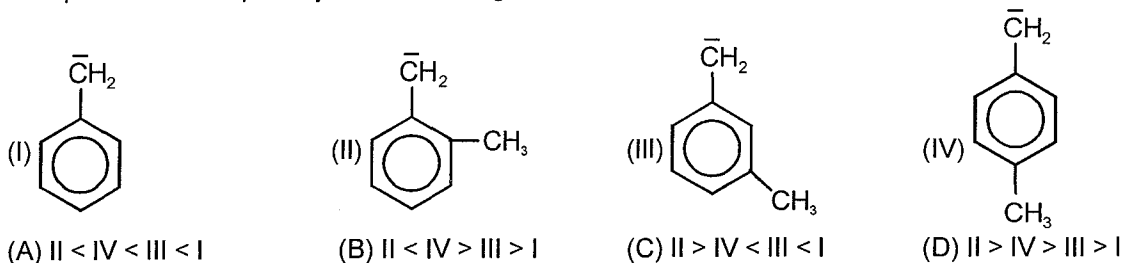
2. Compare the resonance energy in given compound.



- (A) I > II > III (B) I > III > II (C) III > I > II (D) I < II < III

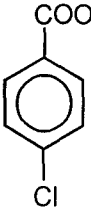
3. XY, X_2 & Y_2 are diatomic molecules. If bond enthalpies of X_2 , Y_2 & XY are in ratio 1 : 5 : 1 & ΔH_f of XY = 200 kJ/mole. What is the bond energy of X_2 .
 (A) 800 kJ (B) 400 kJ (C) 200 kJ (D) 100 kJ

4. Compare the nucleophilicity of the following

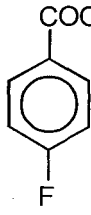


(SPACE FOR ROUGHWORK)




5. Bond energies of $N \equiv N$ bond, $H-H$ bond $N-H$ bond are respectively x_1 , x_2 and x_3 kJ mol^{-1} . Hence, $\Delta H_f^\circ(\text{NH}_3)$ is
 (A) $x_1 + 3x_2 - x_3$ (B) $x_1 + x_2 - x_3$ (C) $(x_1/2) + (3/2)x_2 - 3x_3$ (D) $x_1 + 3x_2 - 6x_3$
6. Arrange the reactivity of the following compounds with AgNO_3 solution in increasing order.
 PhCH_2Cl (a) PhCl (b) $\text{CH}_2 = \text{CHCl}$ (c) $\text{CH} \equiv \text{CCl}$ (d)
 (A) a, c, b, d (B) a, c, d, b (C) a, b, c, d (D) d, b, c, a
7. Compare the magnitude of enthalpy of neutralisation of the following acids ?
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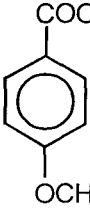
(I)



(II)

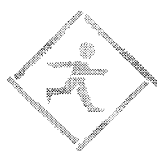


(III)



(IV)
- (A) $\text{IV} < \text{III} < \text{I} < \text{II}$ (B) $\text{IV} > \text{III} > \text{I} > \text{II}$
 (C) $\text{II} > \text{IV} < \text{III} < \text{I}$ (D) $\text{I} > \text{II} > \text{IV} > \text{III}$
8. Consider following chemical change:
- I: $2 \text{Na(s)} + 2\text{H}_2\text{O(l)} \rightarrow 2\text{NaOH(aq)} + \text{H}_2\text{(g)}$ $\Delta H/\text{kcal} = -88$
 $\text{H}_2\text{(g)} + 1/2 \text{O}_2\text{(g)} \rightarrow \text{H}_2\text{O(l)}$ $\Delta H/\text{kcal} = -68$
- II: $2 \text{Na(s)} + 1/2 \text{O}_2\text{(g)} \rightarrow \text{Na}_2\text{O(s)}$ $\Delta H/\text{kcal} = -100$
 $\text{Na}_2\text{O(s)} + \text{H}_2\text{O(l)} \rightarrow 2\text{NaOH(aq)}$ $\Delta H/\text{kcal} = x$
- value of x is
 (A) -68 kcal (B) -88 kcal (C) -100 kcal (D) -56 kcal

(SPACE FOR ROUGH WORK)



MOTION IIT-JEE
 (Where Faith Counts the Success)



[MULTIPLE OBJECTIVE TYPE]

Q.9 to 11 has four choices (A), (B), (C), (D) out of which **one or more than one** is/are correct.

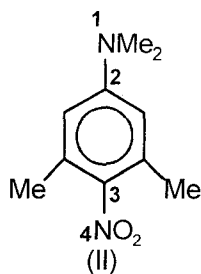
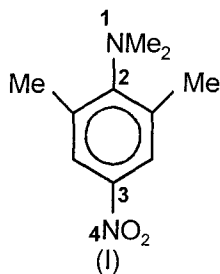
9. When 1.0 g equivalent of each acid HA and HB are neutralised separately by NaOH, the amount of heat released are 43 kJ and 27 kJ, respectively. Which of the following can be concluded accurately?
- (A) Both HA and HB are weak acids.
(B) Ionization constant of HA is greater than that of HB
(C) Enthalpy of ionization of HB is greater than that of HA.
(D) Enthalpy of hydration of HA is greater than that of HB.
10. When the following redox reaction is balanced in basic medium
- $$\text{MnO}_4^- + \text{C}_2\text{O}_4^{2-} \rightarrow \text{MnO}_2 + \text{CO}_3^{2-}$$
- Which of the following statements applies appropriately to the balanced reaction?
- (A) 1.50 moles of oxalate would be oxidized per mol of permanganate
(B) Oxidation number of carbon is changing from +2 to +4.
(C) The equivalent weight of KMnO_4 in the above redox reaction is one-third of its molar mass.
(D) In the balanced reaction, 4OH^- appears on the reactants side

(SPACE FOR ROUGH WORK)



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(Where Faith Counts the Success)

11. Which of the following is correct about these structures.



(A) Basic strength I < II

(B) Bond length between $\overset{1}{\text{N}} - \overset{2}{\text{C}}$ I < II

(C) Bond length between $\overset{3}{\text{C}} - \overset{4}{\text{N}}$ I < II

(D) Bond energy between $\overset{3}{\text{C}} - \overset{4}{\text{N}}$ I < II

(SPACE FOR ROUGH WORK)



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[REASONING TYPE]

Q.12 is Reasoning type question, contains Statement-1 (Assertion) and Statement-2 (Reason) Each questions has four choices (A), (B), (C), (D) out of which **only one** is correct.

12. Statement-1 : Heat evolved in hydrogenation of 1.0 mol of isobutene is less than that for 1.0 mol of trans-2-butene.

Statement-2 : Isobutene has more stable hyperconjugating structure.

- (A) Statement (1) is True, statement (2) is True and statement (2) is correct explanation for Statement (1)
 (B) Statement (1) is True, statement (2) is True and statement (2) is NOT the correct explanation for Statement (1)
 (C) Statement (1) is true, statement (2) is false
 (D) Statement (1) is false, statement (2) is true

[COMPREHENSION TYPE]

Q.13 to Q.15 are based upon a paragraph. Each questions has four choices (A), (B), (C), (D) out of which **only one** is correct.

A steel sample is being analyzed for its iron content. For analysis, a 250 mL stock solution of KMnO_4 was prepared in acidic medium. A 20 mL of the above prepared permanganate solution required 15 mL of a sodium oxalate solution. In a separate titration, 20 mL of the same sodium oxalate solution required 30 mL of a 0.3 M hydrogen peroxide solution.

Finally, 1.0 g of the steel sample was dissolved in dilute sulphuric acid where all iron got converted into ferrous ion, and the volume made to 100 mL by adding distilled water. A 25 mL of the test solution required 6.0 mL of the above mentioned permanganate solution to oxidize ferrous ions into ferric ions.

- 13.** What was the molarity of oxalate solution?
 (A) 0.45 (B) 0.90 (C) 1.8 (D) 0.6
- 14.** What was the molarity of permanganate solution?
 (A) 0.675 (B) 0.135 (C) 0.27 (D) 0.405
- 15.** How many ferrous ions were present in 25 mL of its solution?
 (A) 4.88×10^{20} (B) 2.44×10^{23} (C) 2.44×10^{21} (D) 9.76×10^{21}

(SPACE FOR ROUGH WORK)



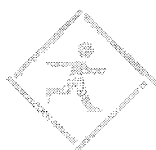
SECTION C

[SUBJECTIVE]

Q.1 to 5 are subjective type questions

1. $\text{Mn} + \text{HNO}_3 \rightarrow \text{Mn}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$
 (n factor of HNO_3 is x_1)
 $\text{P}_4 \rightarrow \text{H}_3\text{PO}_3 + \text{PH}_3$
 (n factor of P_4 is x_2)
 The value of $(x_1 + x_2) \times 4$ is:
2. To 50 litre of 0.2 N NaOH, 5 litre of 1 N HCl and 15 litre of 0.1 N FeCl_3 solution are added. What weight of Fe_2O_3 can be obtained from the ignition of precipitate of ferric hydroxide?
3. Consider the following reaction:
 $\text{C}_2\text{H}_4(\text{g}) + \text{H}_2(\text{g}) \rightarrow \text{C}_2\text{H}_6(\text{g}); \quad \Delta H = -132 \text{ kJ}$
 Also, given are standard molar enthalpies of formation of 1,3-butadiene(g) and butane gas as 115 kJ and -140 kJ per mol, respectively. Hence, the resonance energy of 1,3-butadiene (in kJ unit) is
4. A sample of $\text{Fe}_2(\text{SO}_4)_3$ and FeC_2O_4 was dissolved in H_2O . The complete oxidation of reaction mixture required 40 ml of $\frac{M}{10}$ KMnO_4 in neutral medium. After the oxidation mixture was reduced by Zn and dil. H_2SO_4 . On again oxidation by same KMnO_4 in basic medium, 60 ml were required. Calculate the sum of millimoles of $\text{Fe}_2(\text{SO}_4)_3$ and FeC_2O_4 .
5. 200 ml of 0.25 M H_2A (strong acid) is neutralized by 300 ml of 0.2 M BOH(weak base) in a adiabatic container which results in temperature rise of 1.5°C . If heat capacity of the adiabatic system is $2 \text{ kJ}/^\circ\text{C}$. Then find the sum of enthalpy of neutralisation of HNO_3 Vs BOH and enthalpy of dissociation of CH_3COOH .
Given:
 $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O} + 57 \text{ kJ}$
 $\text{CH}_3\text{COOH} + \text{BOH} \rightarrow \text{CH}_3\text{COOB} + \text{H}_2\text{O} + 48 \text{ kJ}$

(SPACE FOR ROUGH WORK)



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Rough Space



MOTION IIT-JEE

(Where Faith Counts the Success)



MOTION IIT-JEE
(Where Faith Counts the Success)

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