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SSLC MODEL EXAMINATION—FEBRUARY 2013

CHEMISTRY (ENGLISH)

Time: 1½ Hours   Total Score: 40

Instructions:

1. Answer all questions.
2. First 15 minutes are given as "cool off time" in addition to 1½ hours. Use this time to read and understand the questions.
3. Answer the questions only after reading and understanding the questions thoroughly.
4. Manage the time to answser the questions.
5. Score for each question is given against each question.
6. Questions with choice are included. For such questions, answer only one question.
7. Write the question numbers for main and subquestions correctly.

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1. Predict the nature of Chemical bond between the elements in the following compounds

   Score

   (i) $BeCl_2$ [1]

   (ii) MgO [1]

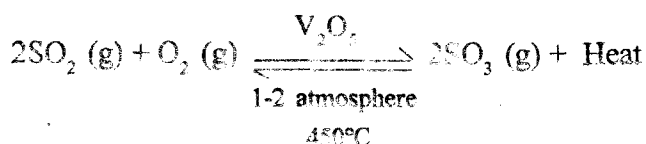   (iii) CCl_2 [1]

   [Hint: Electronegativity values of Be-1.5, Cl-3.0, Mg-1.2, O-3.5, C-2.5]

2. Analyse the flow chart and answer the questions.

   Bauxite —A→ Na_3AlO_3 —Al(OH)→ $Al(OH)_3$ Precipitate —△→ Al_2O_3 —B→ Al
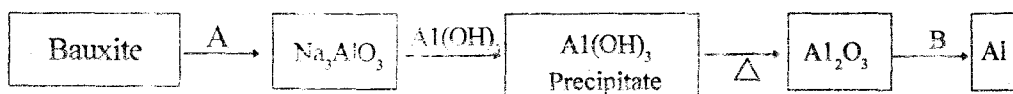
   (i)   Give the Chemical formulae of 'A'.   [1]

   (ii) 'B' is a process. Name the process.   [1]

   (iii) During the process 'B', Al_2O_3 is dissolved in........ ....   [1]

3. Given below is a reversible reaction at equilibrium.

$$2SO_2 \,(g) + O_2 \,(g) \underset{\text{450°C}}{\overset{V_2O_5}{\underset{\text{1-2 atmosphere}}{\rightleftharpoons}}} 2SO_3 \,(g) + \text{Heat}$$

   What will happen to the amount of product in the following situations?

   (i)   Temperature is increased.   [1]

   (ii) Concentration of Sulphur dioxide is decreased.   [1]

   (iii) Pressure is increased.   [1]

4. Metal rods dipped in some solutions in test tubes A, B, C, D and E are given below:

→Cu	→Cu	→Fe	→Fe	→Zn
$FeSO_4$	$CuSO_4$	$CuSO_4$	$FeSO_4$	$FeSO_4$
A	B	C	D	E
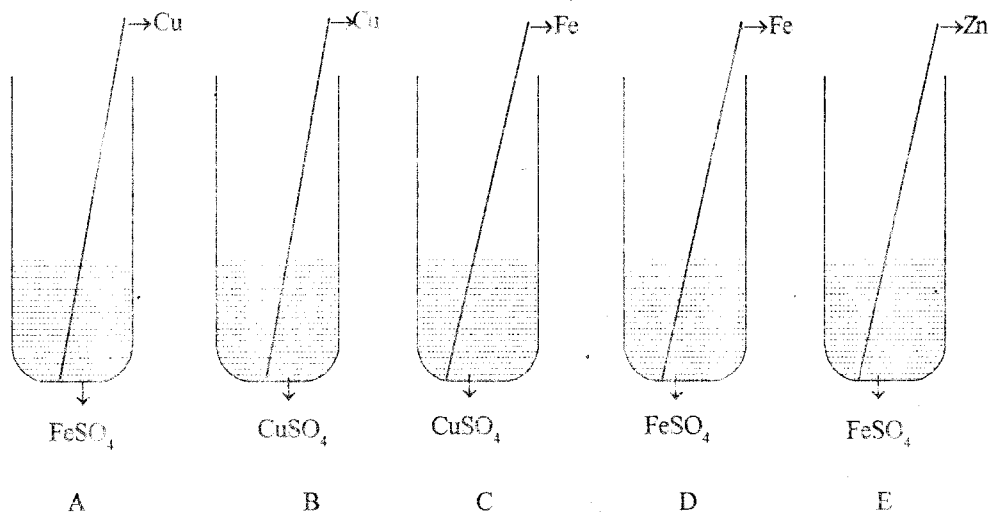
[Hint: Metals in the order of reactivity is

K>Na> Ca> ·Mg> Al> Zn> Fe> Pb>Cu>Ag>Au]

(i) In which of the given test tubes, displacement of metals will take place? [1]

(ii) Write the anode and cathode of a cell formed from B and D.
Write the Chemical equation of the reaction taking place in this cell. [2]

5. Subshell electronic configuration of certain elements are given below:

A—$1s^2 2s^2 2p^6 3s^1$

B—$1s^2 2s^2 2p^4$

C—$1s^2 2s^2 2p^6 3s^2 3p^6$

D—$1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$
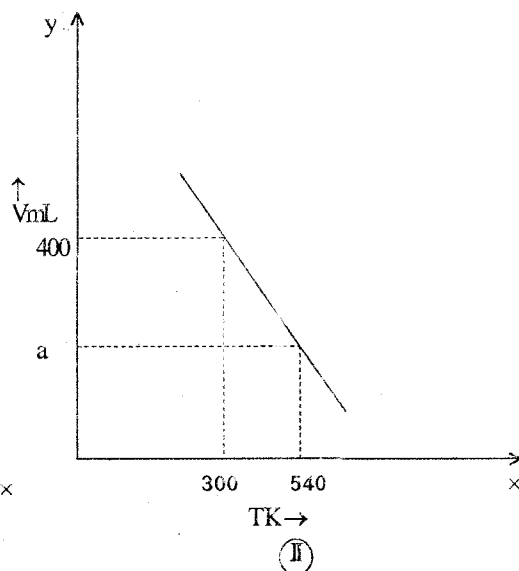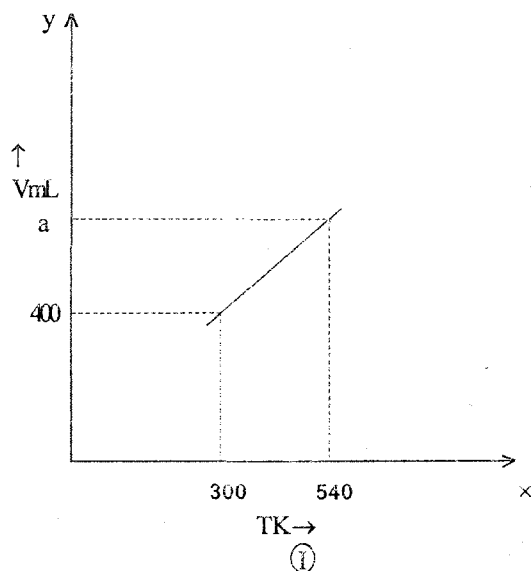
(i) Write the atomic number of the element 'A'. [1]

(ii) Which is the inert gas among them? [1]

(iii) The element 'D' can form coloured compunds.
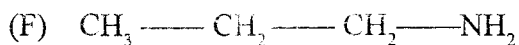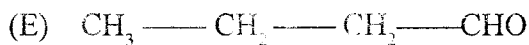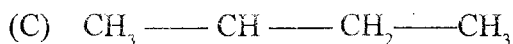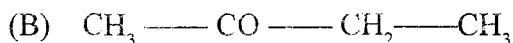
Explain the reason. [1]

(iv) Write the chemical formulae of the compound formed by the elements A and B. [1]

6. Graphs showing the relation between volume and temperature at constant pressure of a gas are given below:

(i) Find out the graph representing Charle's law. [1]

(ii) From the graph representing Charle's law, find out the volume 'a' of the gas if temperature is raised from 300K to 540K. [2]

7. Structural formulae of some organic compounds are given below:

(A) CH_3 —— CH_2 —— CH_2 —— CH_2 —— OH

(B) CH_3 —— CO —— CH_2 —— CH_3

(C) CH_3 —— CH —— CH_2 —— CH_3
　　　　　　|
　　　　　OH

(D) CH_3 —— CH_2 —— CH_2 —— CH_2 — CH_2 —— CH_3

(E) CH_3 —— CH_2 —— CH_2 —— CHO

(F) CH_3 —— CH_2 —— CH_2 —— NH_2

(i) Identify the position isomers from among them. [1]

(ii) Write the structural formulae of two chain isomers of 'D' and IUPAC name of one of these isomers. [3]

(iii) Write the name of the functional group in 'F'. [1]

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8. Ethane on combustion in oxygen gives Carbon dioxide and water.

    (i) Write down the balanced chemical equation for the complete combustion of 2 moles of ethane in oxygen. [2]

    (ii) How many grams of oxygen will be required to burn 60g of ethane completely? [2]

9. Some chemicals are given below:

    [$Fe(NO_3)_3$, NH_4Cl, CaO, dil. HCl, $CaCO_3$, $Ca(OH)_2$, Conc. H_2SO_4]

    (i) Select the chemicals required for the laboratory preparation of ammonia from those given in bracket. [1]

    (ii) Concentrated H_2SO_4 is a drying agent. Can we use concentrated H_2SO_4 for drying ammonia? Why? [1]

10. The reaction between marble and hydrochloric acid is given below:

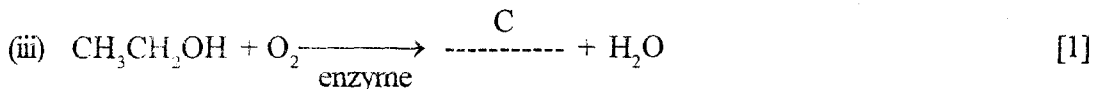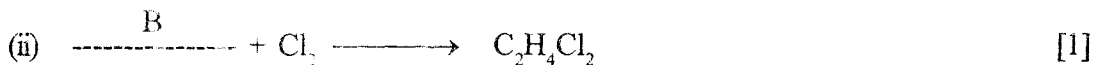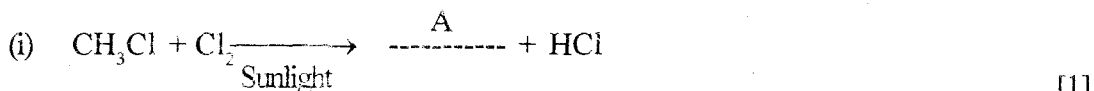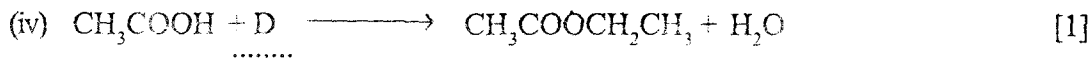$$CaCO_3 + 2HCl \longrightarrow CaCl_2 + CO_2 + H_2O$$

    (i) What will happen to the speed of this reaction when the concentration of HCl is increased ? [1]

    (ii) What will happen to the speed of this reaction when powdered marble is used? Justify your answer. [2]

11. [This question has choice, Answer any one of them]

    (a) Some reactions involving organic compounds are given below. Write the name of the compounds A, B, C and D.

        (i) $CH_3Cl + Cl_2 \xrightarrow{\text{Sunlight}}$ ----A---- $+ HCl$ [1]

        (ii) ----B---- $+ Cl_2 \longrightarrow C_2H_4Cl_2$ [1]

        (iii) $CH_3CH_2OH + O_2 \xrightarrow{\text{enzyme}}$ ----C---- $+ H_2O$ [1]

(iv) $CH_3COOH + D \longrightarrow CH_3COOCH_2CH_3 + H_2O$ [1]
......

OR

(b) Examine the reactions given below:

(I) $CH_4 - Cl_2 \longrightarrow CH_3Cl - HCl$

(II) $_nCH2 = CH_2 \longrightarrow -(CH_2-CH_2)_n$

(III) $C_6H_{14} \longrightarrow C_2H_6 + C_4H_8$

(IV) $CH_3OH + CH_3COOH \longrightarrow CH_3COOCH_3 + H_2O$

Identify the following types of reactions from among the above reactions

(i) Esterification reaction [1]

(ii) Thermal cracking [1]

(iii) Polymerisation [1]

(iv) Substitution reaction [1]

12. Suppose you are invited to speak in a seminar on " Harmful effects of medicine". [3]
Suggest any three unhealthy practices you would like to highlight in your speech.