**GATITU MIXED SECONDARY SCHOOL**

**END OF TERM ONE EXAM CAT 1**

**CHEMISTRY**

**FORM IV 2015**

INSTRUCTIONS:

*Answer all questions in the space provided.*

*Remember to write your* ***registration*** *number.*

1. (a) Differentiate between lattice and hydration energy. (2 marks)

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(b) Use the information below to answer the questions that follow:- (3 marks)

Ca(s) + ½ O2(g) CaO(s) ΔH =-635KJ/mol

C(s) + O2(g) CO2(g) ΔH= -394KJ/mol

Ca(s) + C(s) + 3/2O2(g) CaCO3 ΔH = -1207KJ/mol

Calculate the enthalpy change for the reaction:

Ca(s) + CO2(g) CaCO3(s)

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1. 0.92g of ethanol was found to burn in excess air producing a temperature rise of 32.50C in 200cm3 of water. (C=12.0 H=1.0 O=16.0) (Density of water 1g/cm3, Specific heat capacity of water 4.2kj kg-1k-1)

a) Write the equation for combustion of ethanol. (1 mark)

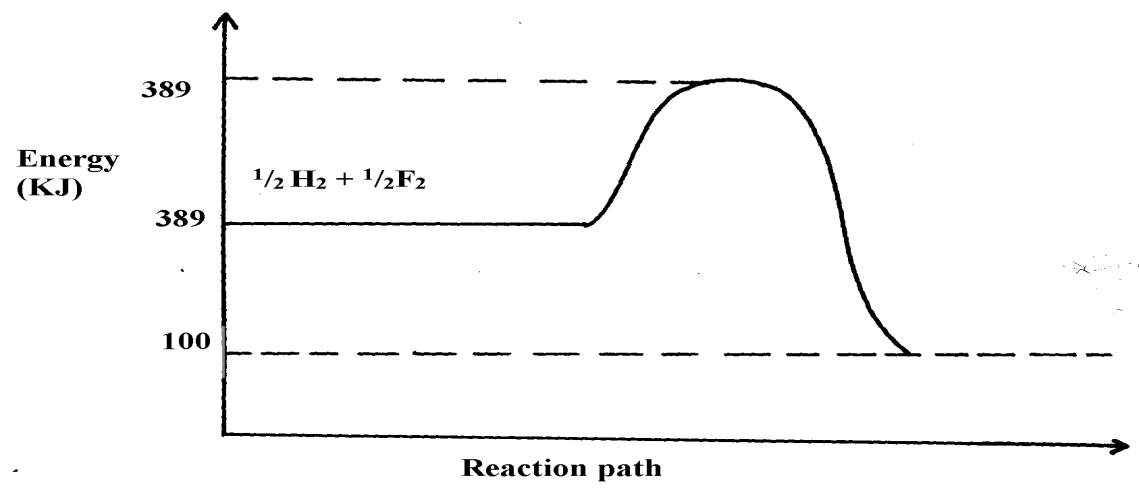
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b) Determine the molar heat of combustion of ethanol. (3 marks)

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1. The diagram below shows energy levels for the reaction

½ H2(g) + ½ F2(g) HF(g)



(a) Work out the activation energy for the reaction (2 marks)

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(b) Calculate the heat of formation of HF (2 marks)

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(c) Is the reaction endothermic or exothermic? (1 mark)

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1. Study the standard electrode potentials for the elements given below and answer the questions that follow. The letters do not represent the actual symbols of the elements

Eθ

Q + 2e- 2Q- (aq) +2.87

2(g)

R2(g) + 2e- 2R-(aq) +1.36

S2+ (aq) + 2e- S (s) + 1.23

2T+(aq) + 2e- T2(g) 0.00

U2+(aq) + 2e- U(s) -0.13

V2+(aq) + 2e-  V(s) -0.76

1. Define the following; (2 marks)
2. Reduction

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1. Oxidation

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1. What is the Eθ value of the weakest reducing agent? (1 mark)

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1. Which element is likely to be hydrogen? Give a reason for your answer (2 marks)

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1. Draw a labeled diagram for the cell that would be obtained when the half cell of elements S and V are combined. (2 marks)

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1. Calculate the e.m.f of the electrochemical cell in a (iii) above (2 marks)

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1. When magnesium reacts with hydrochloric acid, a salt is formed and hydrogen gas.
2. Define an acid. (2 marks)

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1. Write the chemical formulae of the salt formed. (1/2 mark)

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1. The compound was dissolved in water to form an aqueous solution. The solution was then electrolyzed using graphite electrodes containing planitised platinum. Write the half equation that occurred at the;
2. Anode (2 marks)

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1. Cathode

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1. State one observation made at the cathode. (1/2 mark)

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1. Name three amphoteric oxides (1⅟2 marks)

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1. What is a strong acid? (1/2 mark)

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