



UNIVERSITY EXAMINATIONS FOR THE AWARD OF THE DEGREE OF BACHELOR OF
EDUCATION (SCIENCE)

2021/2022 ACADEMIC YEAR

MAY SEMESTER 2022

UNIT CODE: LSCH 2100

UNIT TITLE: CHEMISTRY OF MAIN BLOCK ELEMENTS

DATE: AUGUST 2022

TIME: 2 HOURS

INSTRUCTIONS

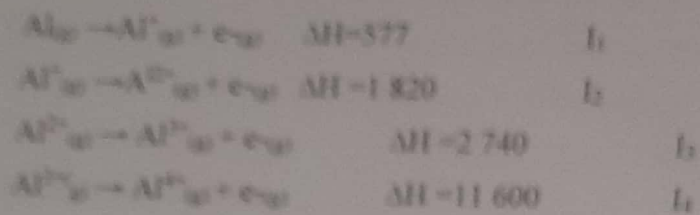
1. Answer question one and any other two questions
2. Do **not** write anything on this question paper
3. Do **not** write in the page margins of the answer booklet
4. Begin each question answer on a new page

QUESTION 1 (COMPULSORY) (30 MARKS)

- (a) Arrange the following in order of increasing acid strength and give reasons for your choice: BBr_3 , BCl_3 , BF_3 . (4marks)
- (b) Explain why beryllium tends to have non-metallic properties even though it is in Group 2 of the periodic table. (4marks)
- (c) Discuss the use of the knowledge of the chemistry of main block elements in the world today. (10marks)
- (d) Explain why the ionic radius of oxygen is 140 pm, 80 pm larger than its atomic radius. (6marks)
- (e) Describe three ways in which nitrogen is made available in soil for plant use even though 75% of air is Nitrogen. (6marks)

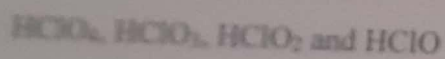
QUESTION 5 (20 MARKS)

(a) Ionization energies (kJ/mol) for various ions of aluminium are given below:-



- (i) Discuss the trend in ionization energies shown (3marks)
- (ii) Explain the reason for the trend. (3marks)
- (iii) Account for the large jump between I_3 and I_4 (4marks)

(b) Given the following oxo-acids:



Predict the trend in their acid strengths

(10 marks)