



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
END OF SEMESTER TWO EXAMINATIONS – MAY 2005
PHYSICAL CHEMISTRY II – SCH 2204
TIME: 3 HOURS

INSTRUCTION TO CANDIDATES

Answer **ANY FOUR** questions. Each question carries 25 marks.
Total Marks – 100

1. The following table gives molar conductance data at infinite dilution at 25°C.

<u>ELECTOLYTE</u>	<u>Ohm⁻¹CM²</u>
Sodiumbutyrate	82,6
Hydrochloric Acid	426,2
Sodium Chloride	126,5

Calculate the molar conductance of butyric acid at infinite dilution at 25°C.

2. For the reaction $\text{Cu}_{(s)} + \text{Cu}^{2+} \rightleftharpoons 2\text{Cu}^+$ when equilibrium is established at 20°C, $[\text{Cu}^{2+}]/[\text{Cu}^+]^2 = 2,02 \times 10^4$. Given that Cu/Cu^{2+} is 0,33V. What is standard potential of the Cu/Cu^+ electrode?
3. The following results were obtained for the decomposition of NH_3 on a tungsten wire at 856°C.

Total Pressure (μm)	228	250	273	318
Time (s)	200	400	600	1 000

Calculate the reaction constant of the reaction.

4. Briefly describe Collision Theory.
5. The following values were obtained for the 2nd order rate constant of a bimolecular reaction.

<u>Temperature/K</u>	<u>Rate Constant/dm³mol⁻¹s⁻¹</u>
285	$1,07 \times 10^{-2}$
290	$2,82 \times 10^{-2}$
298	0,126
306	0,525

- (a) Calculate the energy of activation of the reaction.
(b) What are the limitations of chemical kinetics?

End of question Paper!!!