THE UNITED REPUBLIC OF TANZANIA NATIONAL EXAMINATIONS COUNCIL OF TANZANIA DIPLOMA IN SECONDARY EDUCATION EXAMINATION

CHEMISTRY 1

fine: 3 Hours

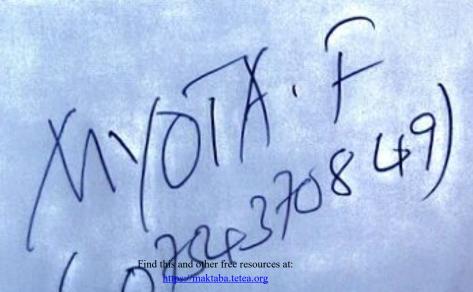
32/1

Tuesday, 15th May 2018 a.m.

Instructions

- This paper consists of sections A, B and C with a total of sixteen (16) questions.
- 2. Answer all questions in section A and two (2) questions from each of sections B and C.
- Section A carries forty (40) marks and sections B and C carry thirty (30) marks each.
- Cellular phones and any unauthorized materials are not allowed in the examination room.
- Mathematical Tables and non-programmable calculators may be used.
- 6. Write your Examination Number on every page of your answer booklet(s).
- The following constants may be used:

l liter = $1 \text{dm}^3 = 1000 \text{cm}^3$; Gas constant, R, = 8.314 J K⁻¹ mol⁻¹.



Suppression A at hit sylmation.

Answer all questions in this section

- As a chemistry teacher, justify the relevance of the chemistry subject in daily life to your 1. Form I students. Give four points.
- (a) What is a transition metal? 2.
 - (b) Briefly explain the observation that copper (I) compounds are coloured whereas copper (II) are not.
- Briefly describe four criteria for choosing a chemistry text book. 3.
- State four amendments on atomic theory against the ones proposed by Dalton. 4.
- (a) List down four gases which cause global warning. 5.
 - (b) Differentiate between greenhouse gases and photochemical smog.
- (a) Define standard solution. 6.
 - (b) With specific example in each case, state four characteristics of primary standard reagents.
- Briefly describe four stages of the lesson development in the chemistry lesson plan. 7.
- 8. Outline four characteristics of a good chemistry test.
- 9. Briefly describe four types of manures.
- 10. (a) Mertion two uses of benzene.
 - (b) (i) Give the meaning of electrophilic substitution.
 - (ii) Using relevant reaction equation; show how aromatic compounds undergo electrophilic substitution.

SECTION B (30 Marks)

Answer two (2) questions from this section.

The experiment to investigate the factors affecting rate of chemical reaction was conducted by reacting 0.02M potassium permanganate solution and 0.05M oxalic acid in dilute sulphuric acid. The experiment was repeated four times using different temperatures and the

Table 1: Experimental results

Temperature		Rostle and the			
Co	K	TK	Time (sec)	1	lea 1
50	323	3.10x10 ⁻³	10 mg	ī	log-t
60	333	3.00x10 ⁻³	50.2	0.019	-1.7212
70	343	2.92 x10 ⁻³	26.00	0.038	-1.4202
80	353	The second secon	12.00	0.083	-1.0809
-	HIVAN SECTION	2.82 x10 ⁻³	5.00	0.200	-0.6989

Ouestions

- What is the role of sulphuric acid in this experiment? (a)
- Of the factors affecting rate of chemical reaction, which one was being investigated? (b) Give a reason.
- Write (c)
 - the half reaction for the oxidized and reduced species.
 - (ii) overall reaction equation.
- Use equation: $\log \frac{1}{c} = \log A \frac{Ea}{2.3R} \frac{1}{T}$ in the form of y = mx + c to calculate the (d) activation energy. Take the value of $m = -9.112 \times 10^3$.
- Compound A, C4H8, and compound B, C5H10, give C4H10 and C5H12 respectively upon 12. hydrogenation. When compound A reacts with water under acidic medium, it gives compound C, a primary alcohol. When C₅H₁₂ reacts with nitric acid under heat, it gives D, C(H11NO2.
 - Write the chemical reactions for the formation of A. B. C and D. (a)
 - Name the structures of A, B, C and D. (b)
 - Give a maximum of five isomers for each of compounds A, B and C. (c)

- 13. (a) Give three differences between strong electrolyte and weak electrolyte.
 - (b) When 25 cm³ of aqueous ammonia is titrated with 0.17 mol/dm³ hydrochloric acid, 20 cm³ of the acid were needed to attain the equivalent point.
 - (i) What is the concentration of the aqueous ammonia?
 - (ii) Given that, pKa for the ammonium ion is 9.3; calculate the pH of the solution equivalence point.

SECTION C (30 Marks)

Answer two (2) questions from this section.

- Chemistry laboratory is a potentially dangerous place where accidents can occur. Descrisive causes of danger in the chemistry laboratory.
- 15. Why is an inquiry the best method of teaching and learning chemistry? Explain by givin four reasons.
- 16. Elaborate five programs in computer, which can be used in teaching and learning chemistry