

TORORO GIRLS' SCHOOL
BEGINNING OF TERM THREE CHEMISTRY TEST
PAPER TWO

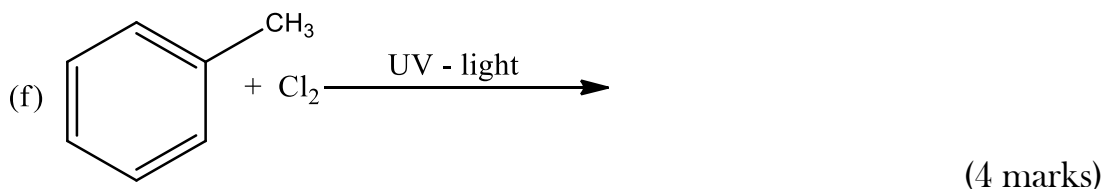
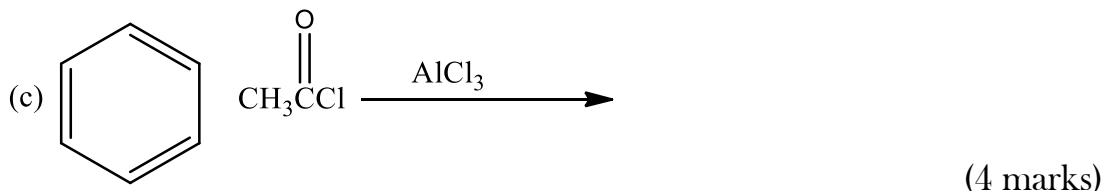
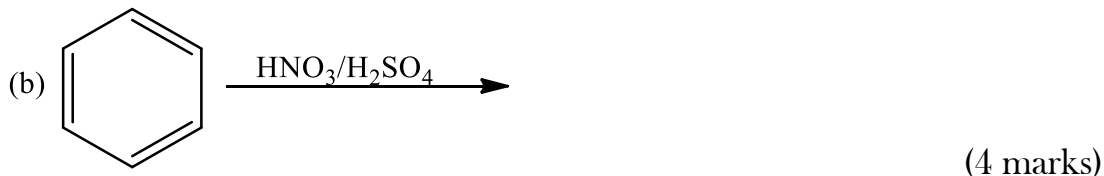
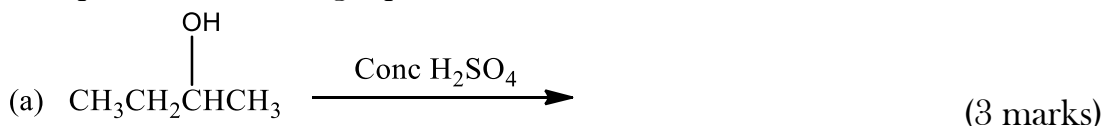
2 Hours

Attempt any five questions

1. Magnesium hydroxide is sparingly soluble in water. The solubility product of magnesium hydroxide is $1.8 \times 10^{-11} \text{ mol}^3 \text{ dm}^{-9}$.
 - (a)
 - (i) Define solubility. (3 marks)
 - (ii) Define solubility product. (3 marks)
 - (b) Describe an experiment which can be used to determine the solubility product of magnesium hydroxide in the laboratory. (5 marks)
 - (c)
 - (i) Write an expression for the solubility product of magnesium hydroxide. (2 marks)
 - (ii) Calculate the molar solubility of magnesium hydroxide in pure water. (3 marks)
 - (iii) Calculate the molar solubility of magnesium hydroxide in 0.0355M potassium hydroxide. (3 marks)

2. Explain the following observations.
 - (a) Propene reacts with bromine in presence of carbon tetrachloride to form 1,2-dibromopropane while in presence of water 1-bromo-propan-2-ol is formed. (6 marks)
 - (b) Tap water should not be used to make standard solutions of sodium hydroxide. (3 marks)
 - (c) Lead (II) chloride is less soluble in water than in concentrated hydrochloric acid. (3 marks)
 - (d) A solution containing 0.2M ethanoic acid and 0.2M sodium ethanoate hardly changes in pH on addition of small amounts of sodium hydroxide or small amounts of hydrochloric acid. (8 marks)

3. Complete the following equations and outline a mechanism for the reaction.



4. The conversion of gaseous nitrogen and hydrogen to ammonia is accompanied by the evolution of 46KJ of heat per mole of ammonia formed.

(a) Write:

- A balanced equation for the reaction that takes place. (1 ½ marks)
- The expression for the equilibrium constant K_p . (1 ½ marks)

(b) If an ammonia plant produces 10^6Kg of ammonia per day by this process, how much heat is liberated? (3 marks)

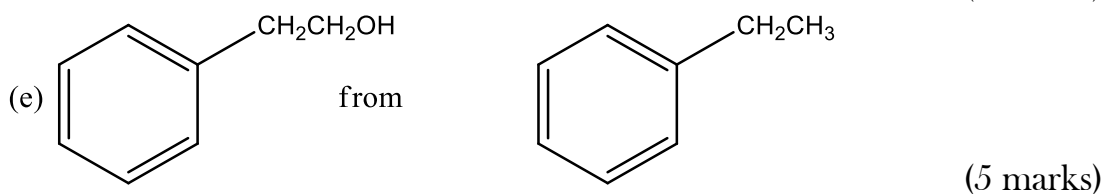
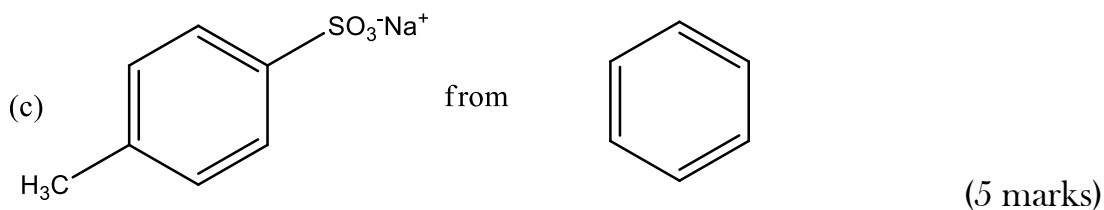
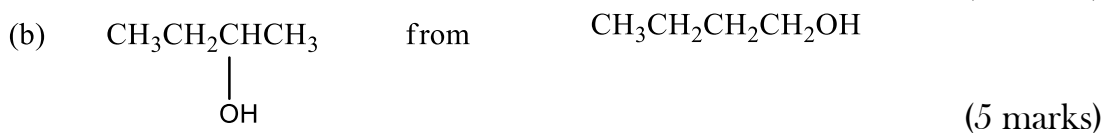
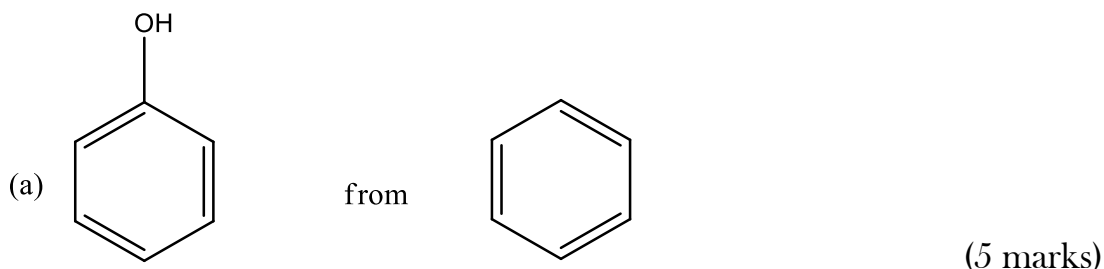
(c) When 3 moles of hydrogen and 1 mole of nitrogen were exploded together at a pressure of 10Pascals and a temperature of 300°C , 50% of nitrogen and hydrogen had become ammonia at equilibrium. Calculate the equilibrium constant K_p . (6 marks)

(d) Describe and explain what would happen to:

- The value of K_p . (3 marks)
- The equilibrium position. (3 marks)
- The rate of attainment of equilibrium. (3 marks)

If the temperature was increased from 300°C to 500°C .

5. Using equations show how the following conversions can be carried out in the laboratory.



6. Fluorine, Chlorine, Bromine and Iodine are members of group (VII) of the periodic table.

(a) The table below shows the first ionization energies of elements of group (VII) of the periodic table.

Element	Fluorine	Chlorine	Bromine	Iodine
Ionization energy/ KJmol^{-1}	1680	1255	1142	1010

State and explain the trend in the ionization energy. (5 marks)

(b) Describe the reaction of the group (VII) elements with sodium hydroxide. (12 marks)

(c) State three properties in which fluorine differs from other members of the group. (3 marks)

END