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CHEMISTRY CAT 2016

FORM 1

TIME: 1 HR

TOTAL MARKS 40

ANSWER ALL THE QUESTIONS IN THE SPACES PROVIDED

1 Atmospheric air contains 21% of oxygen by volume. Calculate the amount of atmospheric air that contains 14 cm^3 of oxygen. (2 Mks)

2 In the process of extracting oil from castor oil seeds in the Laboratory, the seeds are first crushed and then propanone is added instead of water.

(a) Explain why the seeds were crushed first. (1 Mk)

(b) Explain why propanone and not water was added. (2 Mks)

(c) Explain how oil can be separated from propanone. (2 Mks)

3 The table below gives some properties of sulphur, iron and iodine in their solid state. Study it and answer the questions that follow:

Solid	Solubility in ethanol	Attraction by magnet
Sulphur	Insoluble	Not attracted
Iron	Insoluble	Attracted
Iodine	Soluble	Not attracted

(a) Describe how a mixture of iron powder and sulphur powder can be separated.

(1 Mk)

(b) Explain how a pure sample of sulphur and iodine can be obtained from a mixture of iodine and sulphur.

(2 Mks)

2

4 The table below shows liquids that are miscible and those that are immiscible.

Liquid	L ₃	L ₄
L ₁	Miscible	Miscible
L ₂	Miscible	Immiscible

(i) Name the method that can be used to separate L₁ and L₃ from the mixture.

(1 Mk)

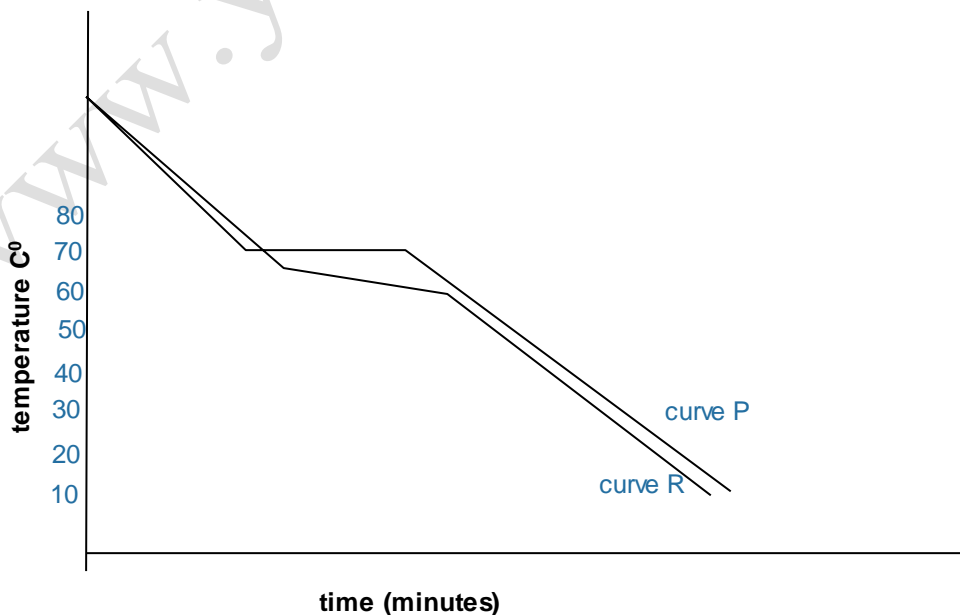
(ii) Describe how a mixture of L₂ and L₄ can be separated. (2 Mks)

5 Name the apparatus you would use to do the following. (8 Mks)

- (a) Measure 50 cm³ of water _____
- (b) Measure exactly 25 cm³ of water _____
- (c) Heating steelwool with a bunsen flame _____
- (d) Burn some sulphur powder on a Bunsen burner flame _____
- (e) Warm 5 cm³ of water in a test tube. _____
- (f) Cool water vapour to liquid during simple distillation. _____
- (g) Evaporate to dryness a salt solution in order to obtain salt. _____
- (h) To dry substances of keep substances free from moisture. _____

3

6 Below is a graphical representation of the cooling curve of pure and impure substance X.



3

(i) What is the boiling point of pure X? (1 Mk)

(ii) which curve represents cooling curve of impure X? Explain. (2marks)

(iii) What is the physical state of X at

(a) 40C^0 (1 Mk)

(b) 75C^0 (1 Mk)

7 Briefly Discuss how Chemistry has helped in improvement of the following areas: **Note:** Give **only** one reason. (5 Mks)

(a) Transport system.

(b) Textile industry

(c) Medicine

(d) Agriculture

(e) Military

8 For each of the following experiments, state the observations and the types of change that occurs i.e. physical or chemical. (10 Mks)

Experiment	Observations	Type of change
Charcoal is burned in air		
Water is cooled in refrigerator to a temperature of -10°C		
Copper (II) carbonate is heated strongly in a test tube.		
Zinc (II) oxide is heated strongly in a test tube.		
A few crystals of ammonium chloride are heated gently in a test tube.		