THE OPEN UNIVERSITY OF SRI LANKA
CERTIFICATE IN LABORATORY TECHNOLOGY 2014/2015
PSC 2322-Advanced Certificate of Laboratory Technology
CONTINUOUS ASSESSMENT TEST II

Registration No : .....

Date: 29th November 2014

Time: 9.30 am-11.00 am

Duration: One and half hours

Question no	Marks
1	
2	

Instructions to Candidates

- **This question paper consists of two structured type questions. Answer all the questions.**

1) (i). Suggest the **most suitable** funnel type for filtration the following.

a). A precipitate with crystalline particles in 100 mL –

b). A precipitate with fine particles in 500 mL of a mixture –

c). A precipitate with fine particles in 50 mL of a mixture –

(06 marks)

(ii). With respect to separation, give **two** advantages and **two** disadvantages of centrifugation compared to filtration. (10 marks)

(iii). Define the boiling point of a liquid. (5 marks)

(iv). In a mixture containing two components A and B , the vapor pressure of pure A is less than the vapour pressure of pure B. Draw the vapor pressure composition curve and boiling point – composition curve and label the diagram. Mark the total vapour pressure of mixture.

(14 marks)

(v). State one difference between simple distillation and fractional distillation with respect to the properties of the mixture to be distilled. (06marks)

(vi) Comment on the situation given below.

"we cannot use fractional distillation for separation of pure components always. " (9 marks)

2) (i). In which situations the following heating devices are used?

1. Sand bath –
2. Air bath –
3. Oil bath –
4. Heating mantle –
5. Water bath –

(10 marks)

(ii). State two ways of maintaining even and gentle heating when a solution is directly boiled using the Bunsen burner. (06 marks)

(iii). a)Write down two properties of a suitable solvent for recrystallization.

(10 marks)

b) State the three possible ways of inducing crystallization. (06 marks)

(iv). Complete the following table on chromatographic methods. (12marks)

Chromatography method	Mobile phase	Stationary phase	Basis/ Principle behind separation
Gas-liquid chromatography			
Thin layer chromatography			
Paper chromatography			

(v). Give three methods that can be used to visualize components in a mixture after separation using Thin layer chromatography. (06 marks)

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Answer guide for PSC 2322 CAT II- 2014/2015

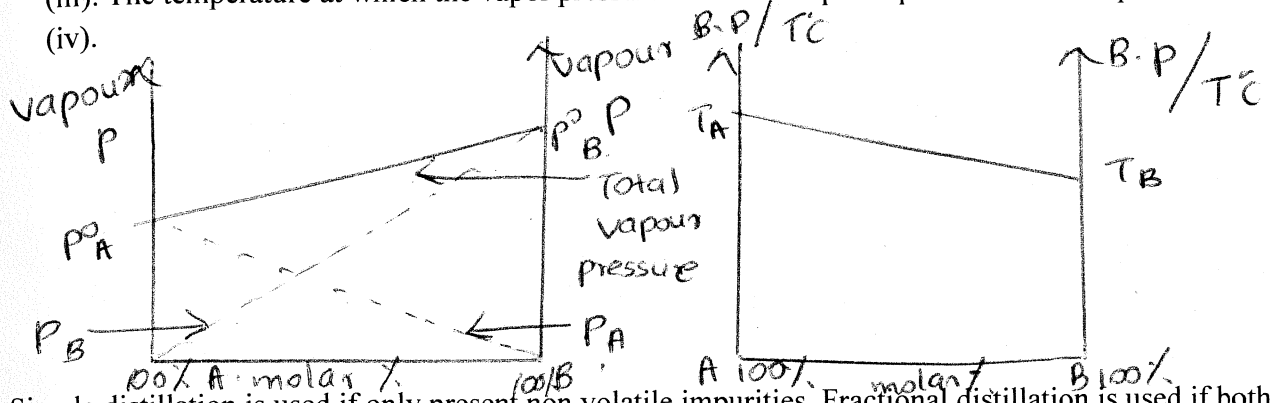
1) (i) a). Glass funnel/ gravity filtration b). Buchner funnel c). Hirsh funnel

(ii). Advantages- Fast separation, no loss of liquid, solids can be recovered easily.

Disadvantages- Expensive, hot separation is not possible. Sample can be heat up at high speeds.

(iii). The temperature at which the vapor pressure above the liquid equals the external pressure.

(iv).



(v). Simple distillation is used if only present non volatile impurities. Fractional distillation is used if both impurity and compound is volatile.

(vi) Fractional distillation cannot be used for non ideal solutions. Two types of non ideal solutions.

If the total vapour pressure is lower than predicted by ideal system- negative deviation

If the total vapour pressure is higher than predicted by ideal system- positive deviation

2)(i). 1. to heat up to high temperatures

2. useful for destructive distillation/ for heating flammable liquids

3. Used where a temperature range is higher than available with water (80- 250 ^oC)

4. Used for flammable liquids and where even heating is required long period of time.

5. for heating flammable liquids with having low boiling point.

(ii). 1. Addition of anti bumping granules to the liquid. 2. Use of a wire gauze on a tripod

(iii). a. 1. It should not react chemically with substance to be purified.

2. At room temperature and below substance must have relatively low solubility in solvent. but at high temperatures should have high solubility.

b. 1. Scratching the side of the tube wall with a glass rod to generate fine particles.

2. Cooling the solution below room temperature with ice and salt mixture.

3. Seeding the original compound

(iv).

Chromatography method	Mobile phase	Stationary phase	Basis/ Principle behind separation
Gas-liquid chromatography	Gas	liquid	Partition
Thin layer chromatography	Liquid	Solid	Adsorption
Paper chromatography	liquid	liquid	partition

(v) . Uv light, iodine bath, using chemical spraying agents