



**Universiti
Malaysia
PAHANG**

Engineering • Technology • Creativity

**FACULTY OF ENGINEERING TECHNOLOGY
TEST**

COURSE	:	BIO & PHARMA ANALYTICAL TECHNIQUE
COURSE CODE	:	BTP4253
LECTURER	:	SITI UMAIRAH MOKHTAR
DATE	:	18 OCTOBER 2016
DURATION	:	1 HOUR 30 MINUTES
SESSION/SEMESTER	:	SESSION 2016/2017 SEMESTER 1
PROGRAMME CODE	:	BTP

INSTRUCTIONS TO CANDIDATE:

1. This paper consists of **THREE (3)** Questions
2. Answer **ALL** questions.
3. All the calculations and assumptions must be clearly stated.
4. Candidates are not allowed to bring any material other than those allowed by invigilator into the examination room.

EXAMINATION REQUIREMENT:

1. Nil

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This examination paper consists of **TWO (2)** printed pages including front page.

Answer ALL questions.

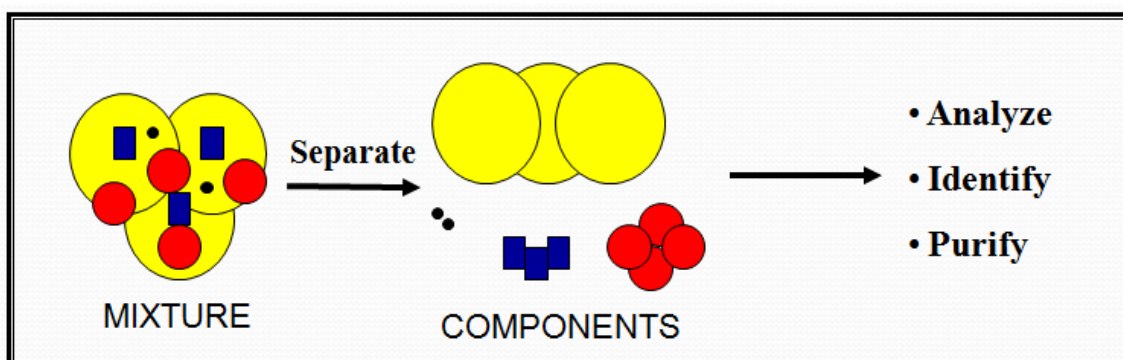
QUESTION 1

Raman and IR spectroscopy are widely used in chemistry, since information given is specific to the chemical bonds and symmetry of molecules.

- a) Explain the theory of spectroscopy. **(4 Marks)**
- b) Draw a schematic diagram of Raman spectroscopy and explain the principles of Raman Spectroscopy. **(12 Marks)**
- c) Discuss **TWO (2)** applications of IR spectroscopy in pharmaceutical. **(4 Marks)**

QUESTION 2

Chromatography is a technique for separating mixtures into their components in order to analyze, identify and purify the mixture or components as shown in figure below:



- a) In chromatography, there are two main principles, which are adsorption and partition chromatography. Explain both principles. **(4 Marks)**

b) The most simplest, fastest and easiest chromatographic technique is Thin Layer Chromatography (TLC). Demonstrate **FOUR (4)** steps involved in the TLC experiments with proper diagram.

(8 marks)

c) There are five main components in High Performance Liquid Chromatography (HPLC) technique, which are pump, injector, column, detector and recorder. Choose **TWO (2)** of them and explain their functions in HPLC.

(4 Marks)

d) HPLC method was applied in many fields including pharmaceuticals, environmental, forensic and food industry. Discuss **FOUR (4)** advantages of HPLC.

(4 Marks)

QUESTION 3

Particle analysis is a study to characterize the properties of particle such as structural analysis, solid state analysis, particle size and rheological, which involves several analytical techniques.

a) Discuss **TWO (2)** importance of particle size analysis.

(4 Marks)

b) Explain **THREE (3)** methods that commonly used to determine particle size.

(6 Marks)

c) Rheology is a study of the flow and deformation of matter under stress. It is a vital study needs to be conducted in formulation of creams, lotions and pastes products. Discuss **TWO (2)** types of fluids for finished pharmaceutical products.

(6 Marks)

- d) Choose any type of fluid given in 3(c) and explain **TWO (2)** techniques available to determine the viscosity of that fluid.

(4 Marks)

END OF QUESTION PAPER