TRANSLATION

UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session of 2005/2006

April/May 2006

EBP 412/3 - Speciality Polymers

Time : 3 hours

Please ensure that this paper consists of SEVEN printed pages before you proceed with the examination.

This paper contains SEVEN questions.

Answer any FIVE questions. If a candidate answers more than five questions, only the first five answered will be examined and awarded marks.

Answer to any question must start on a new page.

All questions must be answered in Bahasa Malaysia.

...2/-

2. [a] Write short notes on the following:

(i) The crystallinity of poly(tetrafluoroethylene)

(10 marks)

(ii) The thermal stability of poly(tetrafluoroethylene)

(15 marks)

[b] Based on the table shown below, predict and comments on the chemical stability of poly(tetrafluoroethylene) towards the respective solvents.

	Solvent	Solubility of PTFE
1.	Xylene	
2.	Toluene	
3.	Perfluorinated Kerosenes	

(25 marks)

[c] Based on the table shown below, describe the processing routes for the respective PTFE product.

1.	Material	PTFE
2.	Additives available	Alumina, Boron, Barium Ferrite
3.	Product	Flexible steam hose

(50 marks)

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4. [a] Write short notes on the following terminologies:

(i) nematic
(ii) smectic A
(iii) anisotropic
(iv) director
(v) mesogen

(25 marks)

[b] Describe typical synthetic route for poly(acrylate) accompanied with appropriate figure.

(25 marks)

[c] Draw and describe the general structure of side-chain liquid crystals polymers.

(25 marks)

[d] Tensile strength and modulus of liquid crystals polymers (LCP) is dependant on the processing technique. Based on appropriate figure, explain the tensile strength and modulus of LCP which is produced by the following processing techniques:

(i) injection molding
(ii) rod extrusion
(iii) compression molding
(iv) fiber spinning

(25 marks)

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[b] Describe and illustrate the usage of polymeric materials in flip-chip package structure. The explanation should consist of types of polymeric materials, filler/reinforcement, additives and its properties.

(60 marks)

7. [a] With the aid of schematic diagram, write an essay on ONE of the following topics

(i) Bearing material in total joint prostheses

(ii) Bone cement

The answer should explain the type of polymeric material used in the application, important properties, and methods to produce the materials suitable with the application.

(50 marks)

[b] Briefly describe pressure-sensitive adhesive for medical applications.

(30 marks)

[c] Cite the differences between biostable and bioabsorbable/bioresorbable polymers.

(20 marks)

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