

EXAMINATION AND EVALUATION DIVISION  
DEPARTMENT OF POLYTECHNIC EDUCATION  
(MINISTRY OF HIGHER EDUCATION)

MECHANICAL ENGINEERING DEPARTMENT

FINAL EXAMINATION  
JUNE 2012 SESSION

**J5282 : PACKAGING MANUFACTURING PROCESS  
(PROSES PEMBUATAN PEMBUNGKUSAN)**

**DATE : 21 NOVEMBER 2012  
DURATION : 2 HOURS (8:30 AM – 10:30 AM)**

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This paper consists of **FOUR (4)** pages including the front page.  
Essay (6 questions – **answer 4** questions )

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**DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED BY**  
**THE CHIEF INVIGILATOR**

This section consists of **SIX (6)** structured questions. Answer **FOUR (4)** questions only.

**QUESTION 1**

- a) State **THREE (3)** methods of pulping in the paper production process. (3 marks)
- b) Describe the situation when the size of paper pulp used is long. (5 marks)
- c) Draw the cross sections for the four types of corrugated board. (12 marks)
- d) Describe the **FIVE (5)** types of physical tests that can be carried out on paper. (5 marks)

**QUESTION 2**

- a) List **THREE (3)** characteristics of thermoplastic and thermosetting plastics. (6 marks)
- b) Draw and label **THREE (3)** of the polymer chains. (6 marks)
- c) With the aid of diagrams, explain how plastic bottles are produced by injection blow molding method. (10 marks)
- d) List **THREE (3)** types of thermoplastic plastics. (3 marks)

**QUESTION 3**

- a) List **FIVE (5)** properties of the metal. (5 marks)
- b) List **FIVE (5)** elements in the reactivity series of the most non reactive. (5 marks)
- c) With the aid of diagrams, describe the process of producing a can using two piece drawing. (15 marks)

*Handwritten notes:*  
 1. ...  
 2. ...  
 3. ...  
 4. ...  
 5. ...

**QUESTION 4**

- a) State the definition of the glass. (4 marks)
- b) List **THREE (3)** types of glass that may be prescribed by the USP standards. (6 marks)
- c) List the quantity of appropriate mixtures of elements in the glass production process. (8 marks)
- d) Describe in detail the type of laminated glass, safety glass and used glass. (7 marks)

**QUESTION 5**

- a) Draw and label a schematic neck screw type. (8 marks)
- b) List **FOUR (4)** categories of closure and name the types of closure. (8 marks)
- c) Draw and label the layers involved in the induction innerseals. (5 marks)
- d) List **FOUR (4)** closure of tamper evidence. (4 marks)

**QUESTION 6**

- a) State the definition of plastic bottle. (5 marks)
- b) List **FIVE (5)** factors to be taken into account before designing a plastic bottle. (5 marks)
- c) List **FIVE (5)** criteria for the selection of materials for making plastic bottles. (5 marks)
- d) Describe **FIVE (5)** additives for plastic bottles. (10 marks)

