



SUMMER EXAMINATIONS 2023

EXAMINATION: UNIT 3 Packaging Materials and Containers II

COURSE: CPD Diploma in Packaging Technology

**DATE: 12th May 2023
10am to 12pm**

EXAMINERS: Ron Gardiner, Tony Duffy

TIME ALLOWED: 2 hours

INSTRUCTIONS: Please answer four questions. All questions carry equal marks

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The use of programmable or text storing calculators, smart phones etc are expressly forbidden. Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.

Question 1 (25 marks)

- a) Briefly describe the three main theories of adhesion .
(10 marks)
- b) Describe three processes by which adhesives set and provide an example of use for each.
(10 marks)
- c) Solid board cartons are constructed using a different adhesive for construction of the manufacturer's joint and the sealing of the flaps, once the carton is filled. Justify the use of an adhesive for each of these applications
(5 marks)

Question 2 (25 marks)

- a) With the aid of a diagram describe how the seals are formed on a 2 kg bag of potatoes
(15 marks)
- b) For the bag of potatoes, review why it is important to control the material parameters and the machine set-up to ensure seal efficiency .
(10 marks)

Question 3 (25 marks)

- a) Consider a 330 ml glass bottle of coca cola with a paper label
- Describe an appropriate glue and label for this application
(6 marks)
 - Discuss the material properties to be considered when specifying, manufacturing and applying this label
(4 marks)
- b) Discuss why the label industry is moving from paper to plastic labels giving examples to illustrate your answer
(9 marks)
- c) Discuss the benefits of using in-mould labelled containers giving examples to illustrate your answer
(6 marks)

Question 4 (25 marks)

- a) What is a laminate structure and why are materials laminated together. List three methods of laminating plastic to plastic.

(5 marks)

- b) A typical laminate is lacquer/reverse printed OPP/adhesive/MOPP/PE. What are the functions of each of these laminate layers and explain what could this laminate be used for, giving examples to illustrate your answer

(10 marks)

- c) Discuss how you could simplify the above laminate structure to reduce its environmental impact giving examples to illustrate your answer

(10 marks)

Question 5 (25 marks)

Plastic bottles for food products can be made using different blow moulding manufacturing methods. Compare and contrast the processes involved in manufacture of these containers and the impact that these can have on the finished pack.

(25 marks)