



LEVEL 5 DIPLOMA IN PACKAGING TECHNOLOGY (QCF)

(Qualification Accreditation Number: 600/0017/X)

EXAMINATION PAPER

November 2016

J/502/5923 UNIT 02

Packaging Materials and Components

Paper A

Reading Time: 5 minutes

Time Allowed: 3 Hours

You are required to pass ALL the learning outcomes

Write your answers in the answer book provided

Wherever possible, use diagrams to illustrate your answer

This is a closed book examination

This examination paper is worth 70% of the total marks for Unit 2

Level 5 Diploma in Packaging Technology (QCF)
Unit 2 – Packaging Materials and Components (Paper A)
November 2016

Learning Outcome 1

Understand the properties of materials which make them suitable for packaging
(This learning outcome is worth 40% of the marks for this paper)

***INSTRUCTIONS TO CANDIDATE: YOU ARE REQUIRED TO ANSWER
TWO QUESTIONS FROM THE FOLLOWING THREE QUESTIONS ONLY***

Question 1

- A) a) Identify the layers in a “Tetra” pack type carton for long life fruit juice (2 marks).
b) Discuss the properties and functions of each material which are required for this product. (10 marks)
- B) a) What are the main features of paper or board which are derived from virgin soft woods and hard woods? (3 marks)
b) How can beating/refining improve the properties of the fibres? (5 marks)

Question 2

- A) Identify TEN properties of aluminium foil when used as a packaging material. Using examples, discuss the advantages and disadvantages of these properties when using this packaging material. (10 x 1 mark)
- B) Explain how the construction and material properties of a 3-piece steel can help to protect and preserve soup over its shelf life. (5 x 2 marks)

Question 3

- A) The following formats are used to pack instant coffee. Justify the materials used for each.
a) Glass jar (4 marks)
b) Flexible laminate pouch (4 marks)
c) Spirally wound composite container (4 marks)
- B) Discuss why glass is the preferred material for packing perfume. (4 x 1 mark)
- C) Discuss FOUR disadvantages of glass for the packing of a carbonated beverage when compared to amorphous polyethylene terephthalate. (4 x 1 mark)

Learning Outcome 2
Understand the synthesis and properties of polymers
(This learning outcome is worth 20% of the marks for this paper)

INSTRUCTIONS TO CANDIDATE: YOU ARE REQUIRED TO ANSWER THIS QUESTION

Question 4

A) Discuss the following types of polymer outlining their structure, properties and provide an example of each:

- Thermoplastic (3 marks)
- Thermoset (3 marks)

B) A carbon double bond is feature of some important monomers. Describe the importance of the double bond in polymerization processes (4 marks) and provide FOUR examples of monomers which have this characteristic. (2 marks)

C) For each of the following; describe the material characteristic, how it influences the properties of the plastic and explain where it is used to good effect:

- Orientation (4 marks)
- Crystallinity (4 marks)

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Learning Outcome 3

Understand the conversion of raw materials into packaging materials and packaging components

(This learning outcome is worth 40% of the marks for this paper)

INSTRUCTIONS TO CANDIDATE: YOU ARE REQUIRED TO ANSWER TWO QUESTIONS FROM THE FOLLOWING THREE QUESTIONS ONLY

Question 5

A soft drinks manufacturer is planning to develop bespoke 330ml decorated glass bottles for a new range of carbonated fruit beverages.

Using diagrams where applicable, describe in detail, the narrow neck press and blow manufacturing process for these bottles starting with raw materials and finishing with dispatch of decorated containers to the customer. Explain why this process is appropriate for this pack. (20 marks)

Your answer should include quality considerations and decoration options.

Question 6

A) Describe how aluminium can be combined with paper to form a flexible packaging material by:

- wet bond lamination (6 marks)
- vacuum metallisation (6 marks)

Your answer should include a reference to the thickness of the aluminium in both processes and an explanation of why a vacuum is required in the metallisation process.

B) Describe two additional methods which could be used to combine aluminium and polymer films into a flexible packaging material. (2 x 3 marks)

C) Heat seal coatings can be applied to aluminium foil; describe ways of how the coating weight can be controlled. (2 x 1 mark)

Question 7

A) Describe and justify the conversion process for a wraparound, die cut, 4 colour printed single wall corrugated blank designed for packing twenty four 330ml bottles containing beer for sale in a major supermarket. Start with paper reels and end with blanks ready for despatch to the packer filler. Use diagrams where necessary. (12 marks)

B) Briefly discuss the advantages/disadvantages of corrugated compared to Kraft solid board as a material to manufacture a container for this pack. (6 x 1 mark)

C) Identify FOUR pieces of key performance information that should be included on a specification of a single wall corrugated case. (4 x ½ mark)