PIABC LEVEL 3 CERTIFICATE IN PACKAGING

(Qualification Number: 610/0741/9)

SAMPLE MARKING BRIEF

Issued: 07 October 2025

Unit A – Role and Functions of Packaging
(13 Marks)

1. Using examples, provide a definition for tertiary packaging. (2 marks)

'Tertiary' or 'Transport' packaging is packaging that is used to group secondary packaging together to aid handling and transportation and prevent damage to the products, for example, the pallet and stretch wrap used to transport a number of corrugated outers containing boxes of soap powder.

2. Identify TWO stages in the packaging supply chain. (2 x ½ mark)

1.	Any two from list below: • Raw material manufacturers • Packaging converters • Packer fillers • Wholesaler/ Retailer • Consumer • Waste collection • Recycling / disposal
2.	

3. Excluding inform and contain, name the other FOUR functions of packaging. (4 x ½ mark)

1.	Sell
2.	Protect
3.	Preserve
4.	Convenience

4. Using examples, briefly explain how primary packaging performs the inform function of packaging. (2 marks)

The pack must provide the consumer with all information they need about the product. Information must be legible by human and electronic means. Information must provide product identification, how to use the product, storage and handling instructions and promotional information. Packs provide information for both legal and marketing reasons. Some information is legally required to be present in the packs. Marketing information will help contribute towards the selling function.

5. Using mayonnaise packed in a labelled glass jar, collated in trays and palletised, then shipped from the manufacturer to the retailer.

Identify TWO mechanical hazards that the complete pack may experience during its journey, describing the typical causes and briefly explain how the packaging system minimises the effects. (2 x 3 marks)

<table>
<tr><td colspan="4">For the collated pack the typical mechanical hazards would be shock, vibration and puncture.</td></tr>
<tr><td>Hazard</td><td>Causes</td><td>Possible Effects</td><td>Mitigating the effects</td></tr>
<tr><td rowspan="2">Shock</td><td rowspan="2">• Falls from vehicles, possibly due to poor stacking
• Shunts due to irregular movement along conveyors
• Drops due to manual handling
• Impacts in transit due to driving over poor road surfaces</td><td rowspan="2">• Breakage of jar
• Deformation of closure
• Damage to case or tray</td><td>• Reduce the amount of manual handling</td></tr>
<tr><td>• Use additional cushioning materials</td></tr>
<tr><td rowspan="3">Vibration</td><td rowspan="3">Vibration occurs naturally in all types of transport and is enhanced by:
• Position in vehicle
• Irregular road surfaces
• Unbalanced loads</td><td rowspan="3">• Breakage of jar
• Scuffing of label
• Stack resonance of pallet</td><td>• Reduce product/pack movement:</td></tr>
<tr><td>• Reduce contact points:</td></tr>
<tr><td>• Protect surfaces:</td></tr>
<tr><td rowspan="2">Puncture and Tearing</td><td rowspan="2">• Poor quality pallets
• Bad handling practices e.g. forklift forks</td><td rowspan="2">• Breakage of jar
• Product spoilage
• Load collapse</td><td>• Good pallet quality</td></tr>
<tr><td>• Good handling practices</td></tr>
</table>

END OF UNIT A

Unit B – Packaging Development Process
(12 Marks)

6. Identify THREE reasons why a company may change a product's packaging. (3 x ½ mark)

1.	Examples include: • Marketing – new variety, legislation or promotion • New branding • Cost savings • Change in format of the contents • Change in format of packaging
2.	
3.	

7. One of the six steps in the packaging development process is developing the packaging brief. When developing a pack for a new product, describe what information about the market is needed to prepare the brief? (4 marks)

Information about the market:

- Who is meant to buy and/or use the product?
- Where, geographically, will it be sold?
- What is the target profile in terms of demographics?
- What is the size of the market? How many units are required? Is the market big enough to warrant custom-designed packaging components?
- Where and how will the product be used?
- What are the demands and expectations of the target market?
- How is the product sold? Is it selected from a catalogue, TV/computer screen or retail shelf? How much 'selling space' will be available? How should the packs be configured for secondary packaging, e.g. is 'shelf ready' a prerequisite?
- What is the target selling price? What features will the consumer expect to see to command this price level?

8. Apart from developing the packaging brief, name the other common steps in the packaging development process. (5 x ½ mark)

1.	Define the objective
2.	Developing solutions
3.	Packaging materials and pack test
4.	Finalising specification
5.	Launch and review

9. Discuss how development costs and lead times might affect decisions when altering packaging. (4 marks)

- Recognition that costs influence feasibility.
- Understanding lead times may delay product launch.
- Link to business/market strategy (e.g. missing seasonal windows).
- Overall evaluation (e.g. balance between investment and competitive advantage).

END OF UNIT B

Unit C – Packaging Sustainability
(11 Marks)

10. Briefly describe environmentally responsible packaging. (2 marks)

Environmentally responsible packaging gets the product from producer to consumer with the minimum use of materials, minimum use of energy and minimum amount of waste. (Must also consider inert or degradable, from renewable or non-renewable sources, capable of being refilled or not and easy or difficult to recycle.)

11. Explain TWO ways customer expectations can influence sustainable packaging development. (2 x 1 mark)

1.	Demand for recyclable/biodegradable packs.
2.	Pressure to reduce unnecessary packaging or use less plastic.

12. What are the SEVEN steps in the hierarchy of waste management? (7 x ½ mark)

1.	Prevent
2.	Reduce
3.	Reuse
4.	Repair
5.	Recycle
6.	Recover
7.	Dispose

13. Identify ONE technique that can be used to assess the impact of packaging on the environment. (½ mark)

Life Cycle Analysis, Life Cycle Assessment, CO2 Equivalent & Carbon Measurement or a similar approach

14. Discuss how environmental assessment tools can support decision-making in packaging design. (3 marks)

- Identifying less impactful materials/processes.
- Balancing sustainability with cost and performance.
- Providing evidence for corporate social responsibility reporting.
- Helping meet legislation or retailer sustainability standards.

END OF UNIT C

Unit D – Packaging Materials and Formats
(27 Marks)

15. Glass is made up from FOUR abundant natural resources. List these FOUR materials. (4 x ½ mark)

1.	Sand (or Silicon Dioxide)
2.	Limestone (or Calcium Carbonate)
3.	Soda Ash (or Sodium Carbonate)
4.	Alumina (or Aluminium Oxide)

16. Briefly describe the THREE common forming processes to make glass containers. Justify the use of each process for the different container types. (3 x 2 marks)

Note to marker: For full marks, a note to explain that a gob of glass enters the parison mould but the way the parison is made differs slightly for each process before it is inverted and blown to shape.	
1.	Blow and blow (commonly used for narrow neck containers eg medicine and spirit bottles where the heavier weight is important for durability and perception of quality.
2.	Press and blow (commonly used to make wide necked jars for a wide range of uses in food and cosmetic sectors)
3.	Narrow neck press and blow (allows better control and further light-weighting of narrow neck containers (e.g. beer and soft drink bottles).

17. What is the temperature of a typical glass furnace? (½ mark)

Between 1500 and 1700 degrees Celsius

18. Identify FOUR types of metal closures and explain where they are used. (4 x 1 mark)

1.	
2.	Examples include: • Can lid for sealing cans of food with double seam. • Crown closure for beer bottles • Screw threaded bottle or jar caps • Roll on pilfer proof (ROPP) bottle tops for wine • Twist on, Twist off lug closure for jars of food • Pry off/ lever lid for paint • Push on, twist off cap for baby food • Two-part preserve lid with sealing plate and screw ring (Kilner)
3.	
4.	

19. What is the alloy of iron and carbon? (½ mark)

Steel

20. A two-piece draw and wall iron (DWI) container can be used for what type of packaging? (½ mark)

Drinks and food cans

21. What does the acronym FBB stand for, describe how it is constructed and what it is used for? (2 marks)

Folding Box Board (FBB)

- Layers of mechanical pulp sandwiched between layers of chemical pulp
- Coating on top and maybe the bottom
- Food and drink cartons which are usually in direct contact with product

22. Explain the dead fold behaviour and stiffness properties of paper and paperboard and why they are important. (2 x 1 mark)

- Dead fold behaviour - Resistance to unfolding after creasing, Important in box making, Dependent on fibre orientation cross direction (CD) is greater compared to machine direction (MD).
- Stiffness - Resistance to crushing, Important in cartons MD>CD, MD runs around carton to reduce bulging

23. A layer of fluted paper sandwiched between two layers of flat paper. This is a description of what type of packaging material? (½ mark)

Corrugated board

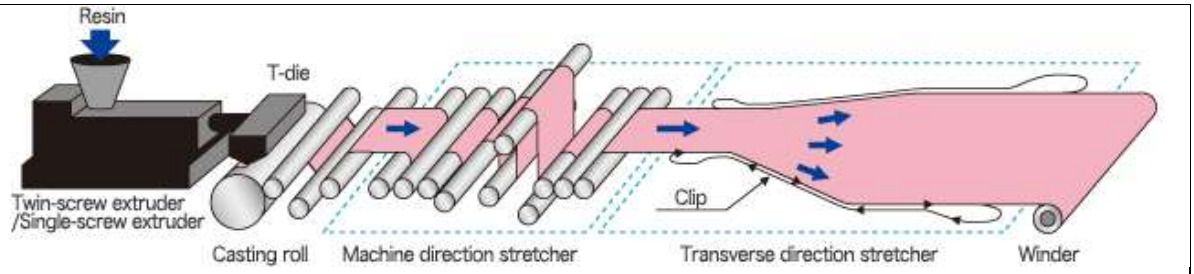
24. What does the acronym PET stand for? (½ mark)

Polyethylene Terephthalate

25. For the following types of plastic packaging. Name ONE common use for each. (3 x ½ mark)

PVC	• Bottles for toiletries • Blister packs • Rigid and flexible films
HDPE	• Bottles • Drums • Bags and sacks • Boil in bag applications
LDPE	• Shrink film, bags, sacks • Coating of heat sealing • Small bottles where flexibility is required • Snap on caps, screw threaded caps for limited use

26. Describe, with the use of an annotated diagram, the cast extrusion process for bi-orientated polypropylene film manufacture. (5 marks)



- The polypropylene granules/resin are melted in a plasticating extruder until it is the correct consistency and temperature
- The molten material is forced through a slot die. The die gap determines gauge of film
- The curtain of material is cooled on a chilled drum / casting roller
- It is then stretched /orientated in the machine and cross/transverse direction.
- The material is trimmed and reeled/wound up

27. Flexible or laminate packaging is usually made up from a number of layers of materials which are stuck or bonded together.

Name TWO of the methods for bonding the layers together. (2 x ½ mark)

1.	• Wet bonding • Dry bonding • Heat set adhesive with extrusion lamination and coating
2.	

28. When choosing the 'best' material for packaging, which important properties do you need to consider and why? (1 mark)

Properties such as:

- Strength (in tension and compression)
- Toughness
- Stiffness
- Weight
- Permeability to oxygen and moisture
- Temperature stability
- Corrosion resistance
- Cost

END OF UNIT D

Unit E – Printing and Decoration Processes
(10 Marks)

29. In theory, all possible colours can be made up combining CMYK. What does the abbreviation CMYK the stand for? (4 x ½ mark)

C	Cyan
M	Magenta
Y	Yellow
K	Key colour usually black

30. List the FIVE main stages in the artwork and reprographic process. (5 x ½ mark)

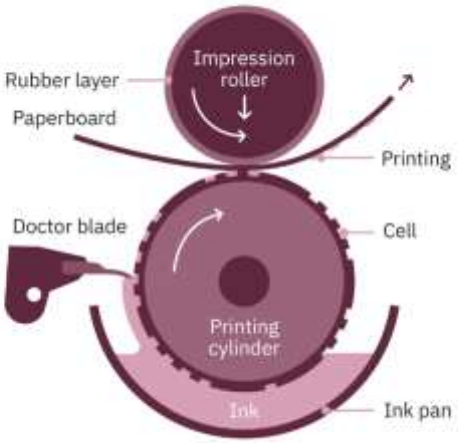
1.	Graphic design
2.	Colour separation
3.	Image assembly
4.	Plate making
5.	Proofing

31. What is the name of the printing process which uses a relief plate for printing crisp packets? (½ mark)

Flexographic printing

32. Describe, with the aid of an annotated diagram, how the rotogravure process works. (5 marks)

- In rotogravure (often shortened to gravure) the printing plate is a cylinder made from copper-plated steel which has been laser, chemical or mechanically etched and then chromium plated
- The engraved cylinder is rotated through the ink tray to fill the depressions
- A doctor blade scrapes ink from the cylinder surface
- The substrate is pushed against plate by an impression roller, and the liquid ink is transferred onto the substrate



END OF UNIT E

Unit F – Packing Line Operations
(7 Marks)

33. List TEN common packing line operations to pack jam into a glass jar from receipt of packaging items to despatch of product to customer. (10 x ½ mark)

1.	Loading the packing line
2.	Inspection and cleaning
3.	Presentation to filler
4.	Filling
5.	Closing the pack
6.	Labelling
7.	Coding/metal checking/weight checking
8.	End of line operations/secondary packaging/collation pack/identification label
9.	Palletised
10.	Removal from the packing line

34. What does the acronym VFFS stand for? (½ mark)

Vertical Form Fill Seal

35. Identify THREE different ways a pack can be labelled. (3 x ½ mark)

1.	Three from: • Wet Glue • Self-Adhesive • Shrink Sleeved • Stretch Sleeved
2.	
3.	

END OF UNIT F

Please use the following page if you need more space for answering any question.

Question number	Your answer

END OF EXAMINATION PAPER