

**SUMMER EXAMINATIONS 2017**

**EXAMINATION:**

**UNIT 4 Package Printing and Decorating & Packaging Machinery**

**COURSE:**

**CPD Diploma in Packaging Technology**

**DATE:**

**May 11th 2017**

**2pm to 4pm**

**EXAMINERS: Tony Duffy, David Little, Ron Gardiner**

**TIME ALLOWED: 2 hours**

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

**PLEASE DO NOT TURN OVER THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO**

**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.**

**Unit 4** **Page 1 of 3**

**Question 1 (25 marks)**

1. **Four of the most common print processes are Gravure, Litho, Dry Offset and Flexography. Pick 3 of these and briefly describe the type of plate used for each process, whether the plate is right or wrong reading and how the image is created on the plate.**

**(15 marks)**

1. **Describe briefly 10 of the 15 pre-press terms listed below:**
   1. **CMYK**
   2. **Resolution**
   3. **Density**
   4. **Special colour**
   5. **Trim marks**
   6. **L\*a\*b\***
   7. **Fingerprint test**
   8. **Lpi / dpi**
   9. **Repro**
   10. **Keyline**
   11. **RGB**
   12. **Retouching**
   13. **PMS**
   14. **Grip / trapping**
   15. **Register marks**

**(10 marks)**

**Question 2 (25 marks)**

1. **In the design of a new FMCG product, describe the stages of design development from the creative to print ready files.**

**(10 marks)**

1. **List and evaluate the three fundamental messages used by Marketeers in the design and promotion of a product and asked by customers when they are considering buying a product. Is one more important than the other? Give a reason for your answer.**

**(15 marks)**

**Unit 4** **Page 2 of 3**

**Question 3 (25 marks)**

1. **Describe with the aid of a diagram the on-line activities from raw material receipt to finished goods despatch for producing a pack of extruded crisps.**

**(20 marks)**

1. **Review key material/ machine parameters to control that may affect the seal integrity of the pack of crisps.**

**(5 Marks)**

**Question 4 (25 marks)**

1. **A packaging line consists of a bottle feeder, filler, labeller and case packer. The running speeds and efficiency of the equipment are given below. What is the expected output from this line?**

**Feeder** **125 bottles per minute, 80% efficiency**

**Filler** **100 bottles per minute, 90% efficiency**

**Labeller** **120 bottles per minute, 85% efficiency**

**Case packer** **140 bottles per minute, 80% efficiency**

**(5 marks)**

**b) Discuss how accumulation can be used to improve line efficiencies.**

**(8 marks)**

1. **Describe what overall equipment effectiveness is and discuss how it could be improved.**

**(12 marks)**

**Question 5 (25 marks)**

1. **Describe the manufacturing process for a frozen chicken curry ready meal from receipt of raw material to dispatch of finished goods. Include in your answer a justification for all types of filling processes used.**

**(20 marks)**

1. **For the product described above, what are the important material characteristics for the production line and the product**

**(5 marks)**

**Unit 4** **Page 3 of 3**

**Question 1 (25 marks)**

1. **Four of the most common print processes are Gravure, Litho, Dry Offset and Flexography. Pick 3 of these and briefly describe the type of plate used for each process, whether the plate is right or wrong reading and how the image is created on the plate.**

**(15 marks)**

### Answer:

\*\*Gravure Printing:\*\*

- \*\*Plate Type:\*\* Gravure printing uses a cylindrical plate with cells or indentations that hold the ink. These cells are engraved onto the plate.

- \*\*Reading:\*\* The plate used in gravure printing is right reading, meaning that the image on the plate appears correctly when viewed directly.

- \*\*Image Creation:\*\* The image is created on the plate by engraving the desired design or image onto the cylinder. Ink is then applied to the plate, filling the cells, and the excess ink is wiped off, leaving ink only in the engraved areas. When the plate comes into contact with the substrate, the ink is transferred, creating the printed image.

\*\*Flexographic Printing:\*\*

- \*\*Plate Type:\*\* Flexographic printing uses flexible polymer plates that are mounted on a cylinder. These plates are typically made of rubber or photopolymer materials.

- \*\*Reading:\*\* The plate used in flexography is wrong reading, meaning that the image on the plate appears reversed or mirrored.

- \*\*Image Creation:\*\* The image is created on the plate by exposing the photopolymer plate to UV light through a film negative of the desired image. The areas exposed to light harden, forming the image, while the unexposed areas are washed away. Ink is then applied to the plate, and the image is transferred onto the substrate during printing.

\*\*Dry Offset Printing:\*\*

- \*\*Plate Type:\*\* Dry offset printing uses flat plates made of metal or plastic. These plates have a raised image area that transfers the ink to the blanket, which then transfers it to the substrate.

- \*\*Reading:\*\* The plate used in dry offset printing is right reading, ensuring that the image on the plate is correctly oriented.

- \*\*Image Creation:\*\* The image is created on the plate by etching or engraving the raised image area. Ink is applied to the plate, and the image is transferred to a rubber blanket before being offset onto the substrate. This process allows for high-quality printing on various materials.

* 1. **CMYK**
  2. **Resolution**
  3. **Density**
  4. **Special colour**
  5. **Trim marks**
  6. **L\*a\*b\***
  7. **Fingerprint test**
  8. **Lpi / dpi**
  9. **Repro**
  10. **Keyline**
  11. **RGB**
  12. **Retouching**
  13. **PMS**
  14. **Grip / trapping**
  15. **Register marks**

**(10 marks)**

Here are brief descriptions of the pre-press terms you requested:

1. \*\*CMYK\*\*: CMYK stands for Cyan, Magenta, Yellow, and Black. It is the color model used in color printing, where colors are created by combining these four ink colors.

2. \*\*Resolution\*\*: Resolution refers to the sharpness and clarity of an image, typically measured in dots per inch (dpi) or pixels per inch (ppi).

3. \*\*Density\*\*: Density refers to the darkness or lightness of an image or printed area, which is affected by the amount of ink or toner used.

4. \*\*Special Color\*\*: A special color, also known as a spot color, is a color that is printed using a dedicated ink, rather than being created by mixing CMYK inks.

5. \*\*Trim Marks\*\*: Trim marks are printed lines or indicators on the edges of a document that show where the final printed piece should be cut or trimmed.

6. \*\*L\*a\*b\*\*\*: L\*a\*b\* is a color space that describes all the colors visible to the human eye. It is often used in color management and proofing.

7. \*\*Fingerprint Test\*\*: A fingerprint test is a process used to ensure consistent color reproduction across different printing presses and materials.

8. \*\*Lpi / dpi\*\*: Lpi (lines per inch) refers to the resolution of a halftone screen, while dpi (dots per inch) refers to the resolution of a digital image.

9. \*\*Repro\*\*: Repro, short for reproduction, refers to the process of preparing digital files for printing, including tasks like color correction, image editing, and layout.

10. \*\*Keyline\*\*: A keyline is a thin, non-printing line that defines the boundaries of an element, such as a logo or graphic, on a printed piece.

11. \*\*RGB\*\*: RGB stands for Red, Green, and Blue, and is the color model used for digital displays and screens.

12. \*\*Retouching\*\*: Retouching is the process of editing or enhancing a digital image to improve its appearance or correct flaws.

13. \*\*PMS\*\*: PMS, or Pantone Matching System, is a standardized color matching system used in the printing industry to ensure consistent color reproduction.

14. \*\*Grip / Trapping\*\*: Grip, also known as trapping, is the overlapping of adjacent colors to prevent gaps or misregistration during the printing process.

15. \*\*Register Marks\*\*: Register marks are printed targets or indicators used to ensure proper alignment and registration of different color separations during the printing process.

**Question 2 (25 marks)**

1. **In the design of a new FMCG product, describe the stages of design development from the creative to print ready files.**

**(10 marks)**

1. **List and evaluate the three fundamental messages used by Marketeers in the design and promotion of a product and asked by customers when they are considering buying a product. Is one more important than the other? Give a reason for your answer.**

**(15 marks)**

Answer:

A. Stages of Design Development from Creative to Print-Ready Files:

1. \*\*Concept Development\*\*: This stage involves ideation, brainstorming, and the generation of initial design concepts for the new FMCG product. The design team works closely with the marketing and product development teams to understand the target market, brand positioning, and key product features.

2. \*\*Sketching and Visualization\*\*: The design team creates rough sketches and visual representations of the product packaging. This allows for the exploration of different design elements, such as shape, size, graphics, and typography.

3. \*\*Computer-Aided Design (CAD)\*\*: The design concepts are then translated into digital files using CAD software. This enables the creation of detailed, scalable, and editable packaging designs.

4. \*\*Prototyping and Mockups\*\*: Physical prototypes or mockups of the packaging are created to evaluate the design, ergonomics, and functionality. This stage allows for testing and refinement of the design.

5. \*\*Graphic Design and Artwork\*\*: The finalized packaging design is then used to create the necessary artwork and graphics, including logos, images, and text. This stage ensures that the design is print-ready and meets the required specifications.

6. \*\*File Preparation and Optimization\*\*: The design files are prepared for printing by optimizing the resolution, color profiles, and file formats. This step ensures that the final printed product matches the digital design.

7. \*\*Printing and Production\*\*: The print-ready files are then sent to the printing and production facilities, where the actual packaging is manufactured and assembled.

B. Fundamental Messages Used by Marketers and Considered by Customers:

1. \*\*Product Benefits\*\*: Customers are primarily interested in understanding the benefits that the product offers, such as its functionality, performance, or value proposition. Marketers need to effectively communicate these benefits through the packaging design and promotional materials.

2. \*\*Brand Identity\*\*: Customers often make purchasing decisions based on the brand's image, reputation, and perceived quality. Marketers use the packaging design to convey the brand's personality, values, and positioning.

3. \*\*Emotional Appeal\*\*: In addition to functional and rational considerations, customers are also influenced by the emotional connection they feel with the product. Marketers can leverage the packaging design to evoke specific emotions, such as nostalgia, excitement, or trust.

Evaluation and Importance:

While all three fundamental messages are important, the product benefits are generally considered the most crucial factor in a customer's purchasing decision. Customers are primarily interested in understanding how the product can meet their needs and solve their problems. If the packaging fails to effectively communicate the product's benefits, it may not be able to capture the customer's attention and interest, regardless of the brand identity or emotional appeal.

That said, the brand identity and emotional appeal can also play a significant role in differentiating the product and influencing the customer's perception. A strong brand identity can build trust and loyalty, while an emotional connection can create a more memorable and engaging experience for the customer.

In summary, while all three fundamental messages are important, the product benefits should be the primary focus for marketers when designing the packaging and promotional materials for a new FMCG product.