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Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2016/2017**

COURSE NAME : PACKAGING GLASS AND METAL  
COURSE CODE : BNK 30203  
PROGRAM : BNK  
EXAMINATION DATE : DECEMBER 2016/JANUARY 2017  
DURATION : 2 HOURS AND 30 MINUTES  
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **FOUR(4)** PAGES

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Fakulti Teknologi Kejuruteraan  
Jalan Teknologi, Kejuruteraan  
Kampus Khas  
MD ZIN BIN IBRAHIM

- Q1**
- (a) Give the definition of glass and **Four (4)** main raw material to make the glass  
(4 marks)
  - (b) Explain briefly **Five (5)** types of glass composition.  
(10 marks)
  - (c) Glass containers have several characteristic of advantages. Explain the term of temper evident and strength benefits.  
(6 marks)
  - (d) Differentiate glass pack integrity and product compatibility base on safety and product compatibility.  
(5 marks)
- Q2**
- (a) Packaging technologist readily bring together all the expertise necessary to produce a food container of the ultimate design, cost and quality to meet all consumer needs. Suggest how the concept design, product design and mold design can support to achieve the goal.  
(9 marks)
  - (b) **Figure Q2(b)** shows the glass bottle for production of wide-mouth containers such as jars. Develop the suitable manufacturing process and . sketch the schematic process diagram to support the answer.  
(10 marks)
  - (c) The attack of molten glass on refractory materials is of prime importance to both the glass maker and refractory manufacturer. Identify **two (2)** basic tests have been developed for the investigation of refractory.  
(6 marks)

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- Q3** (a) Explain briefly advantages of metal as a food product packaging (5 marks)
- (b) Propose the manufacturing processes for **two (2)** types of metal below as a packaging material. Shows the schematic flow process to support your answer.
- (i) Steel or Iron (10 marks)
- (ii) Aluminum (10 marks)
- Q4** (a) Many metal packaging material coated on one or both side. Propose the external and internal coating for metal. (6 marks)
- (b) Differentiate 3-piece cans and 2-piece cans (draw and redraw). (4 marks)
- (c) **Figure Q4(c)** shown 3-piece draw and redraw welded can. Develop base on diagram, step by step the manufacturing of welded can. (15 marks)

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- END OF QUESTION -

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**Figure Q2(b)**



**Figure Q4(c)**

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