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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018**

COURSE NAME : SUSTAINABLE ENVIRONMENT
AND PACKAGING

COURSE CODE : BNK 30802

PROGRAMME CODE : BNK

EXAMINATION DATE : JUNE / JULY 2018

DURATION : 2 HOURS

INSTRUCTION : ANSWERS **FOUR (4)** QUESTIONS
ONLY

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

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Q1 Waste management encompasses the process of collection, transportation, disposal or recycling and monitoring of waste. The term is assigned to the material or waste material that is produced through human being activity. This material is managed to avoid its adverse effect over human health and environment. For example, a food packaging contributes approximately 66% to the waste stream and potentially creates the biggest problem regarding their waste management.

(a) Identify the best option for dealing with waste.

(5 marks)

(b) Select **ONE (1)** type of waste management or recycling technique for a product. Discuss the method, highlight on the benefit and also the limitation of the technique chosen. Your answer can be supported with the related diagram.

(15 marks)

(c) Conclude the benefit of reduce, reuse and recycle to the sustainable development.

(5 marks)

Q2 (a) Identify elements of green policy for industrial requirement.

(3 marks)

(b) Summarize the evolution of sustainable manufacturing concepts and practices in the Table form.

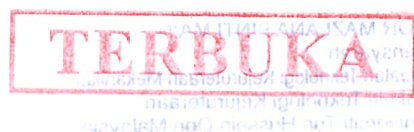
(10 marks)

(c) Interpret the challenges upon implementing the green industry policy.

(4 marks)

(d) Draw a diagram of pollution prevention (P2). Correlate and explain how P2 could be the effective means of protecting our environment, eliminating costly waste and promoting sustainable development.

(8 marks)



Q3 (a) Products produced from petrochemicals are essential and used every day in our life. From vehicles to a variety of electronics, almost all of the things we use today are powered by petrochemicals.

(i) Define petrochemical in term of its resources.

(3 marks)

(ii) Classify the product of petrochemical.

(9 marks)

(iii) The pattern of bonding between all atoms in the molecules is important in chemical structure of the polymer. Sketch the chemical structure for Polyethylene, Polypropylene, Polyvinyl chloride (PVC) and Polystyrene (PS).

(8 marks)

(b) There are a number of options available for managing recyclable and compostable waste. One of the technique is In-Vessel Composting (IVC). With the aid of diagram, illustrate stages of IVC recycling technique for food waste.

(5 marks)

Q4 (a) Interpret the definition of landfill.

(4 marks)

(b) Identify the problems that are often encountered in landfills.

(4 marks)

(c) Predict the criteria for the landfill location in order to obtain a permit.

(4 marks)

(d) Discover the elements in sustainable recycling biomaterials.

(4 marks)

(e) Briefly explain **THREE (3)** examples of recycled biomaterial.

(9 marks)

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- Q5** (a) Explain what 'Life Cycle Assessment' is and provide example. (4 marks)
- (b) Differentiate between 'Life Cycle Assessments (LCA)', 'Life Cycle Inventory (LCI)' and 'Life Cycle Impact Assessment (LCIA)'. (6 marks)
- (c) Distinguish between 'Wal-Mat' and 'Packaging Impact Quick Evaluation Tools (PIQET)' in term of effectiveness, efficiency, cyclic and clean. (8 marks)
- (d) Assess how 'SimaPro' software can benefits 'LCA'. (7 marks)

-END OF QUESTIONS -

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