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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022**

COURSE NAME : HERBAL TECHNOLOGY
COURSE CODE : BWJ 40903
PROGRAMME CODE : BWW
EXAMINATION DATE : JANUARY / FEBRUARY 2022
DURATION : 3 HOURS
INSTRUCTION : 1. ANSWER ALL QUESTIONS.
2. THIS FINAL EXAMINATION IS AN
**ONLINE ASSESSMENT AND
CONDUCTED VIA OPEN BOOK**

THIS QUESTION PAPER CONSISTS OF **THREE (3) PAGES**

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- Q1** (a) Define phytoconstituents. (2 marks)
- (b) You are the Chief Executive Officer of a newly set-up herbal company called BioHerbs Sdn. Bhd. The mission of your company is to design and develop new herbal healthcare products based on demand. Recommend your approaches in developing new generation of herbal healthcare products using a flowchart. (10 marks)
- (c) Explain the **FOUR (4)** basic principles of herbal extraction. (8 marks)
- Q2** (a) (i) Describe what herbal processing is. (2 marks)
- (ii) You are the herbalist expert who is very grateful for the advances in modern technology for herbal processing. Analyze **TWO (2)** modern machineries and explain why these machineries have made your life easier. (8 marks)
- (b) (i) Define Post-Harvest Management (PHM). (2 marks)
- (ii) One of the technical specifications of PHM is a trained and skilled personnel. Demonstrate **FOUR (4)** responsibilities of the personnel handling medicinal plant material. (8 marks)
- Q3** (a) Discuss why chewable tablets are usually reserved for children. (4 marks)
- (b) Explain **THREE (3)** reasons for the shift from traditional to modern herbal preparation. (6 marks)
- (c) In your opinion, propose whether liquid herbal extracts are better than herbal pills based on **FIVE (5)** points as stated below: (10 marks)
- (i) Freshness
 - (ii) Absorption and digestion
 - (iii) Convenience
 - (iv) Shelf life
 - (v) Palatability

Q4 The development of nanoparticle-based herbal formulations has yielded the opportunities to address and treat challenging diseases.

(a) Examine the necessity of nanoparticle-based herbal formulations as a therapeutic and diagnostic agent.

(8 marks)

(b) Determine the principles of the following electron microscopy techniques on physicochemical characteristics of nanoparticle-based drug formulations.

- (i) Scanning electron microscopy (SEM)
- (ii) Transmission electron microscopy (TEM)
- (iii) Atomic force microscopy (AFM)
- (iv) Differential scanning calorimetry (DSC)

(12 marks)

Q5 National Pharmacy Regulatory Agency (NPRA) under the Malaysian Ministry of Health (MOH) is responsible for natural product registration, licensing, monitoring and surveillance activities.

(a) According to Drug Registration Guidance Document (DRGD), natural products are classified in a few categories. Distinguish between traditional medicines and finished herbal products.

(8 marks)

(b) For product registration, natural products samples need to be submitted to the Drug Analysis Division for quality control analysis. Describe the control limits of heavy metals.

(6 marks)

(c) Certain ingredients are prohibited or banned in natural products formulations. Categorize **TWO (2)** prohibited or banned ingredients with examples.

(6 marks)

- END OF QUESTIONS -

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