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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020**

COURSE NAME : COMPOSITE
COURSE CODE : BDB 40703
PROGRAMME CODE : BDD
EXAMINATION DATE : JULY 2020
DURATION : 3 HOURS
INSTRUCTION : ANSWERS FIVE (5) QUESTIONS ONLY.

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

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TERBUKA

- Q1**
- (a) Interpret the concepts of composites in real world's application. (5 marks)
 - (b) Examines the key drivers in material developments using filler as reinforcement agent. (5 marks)
 - (c) Suggest the properties modification based on different matrices and reinforcement for composites . (10 marks)
- Q2**
- (a) Differentiate the theoretical principal of adhesion vs cohesion. (5 marks)
 - (b) How would you categorize the bonding between reinforcement and matrix? (5 marks)
 - (c) Suggest the important of fiber terminology to any selected mechanical properties of composite. (10 marks)
- Q3**
- (a) (i) Develop your own failure mode of sandwich composites by using schematic diagram upon applied load. (5 marks)
 - ii) Identify the main failure mode based on b (i). (5 marks)
 - (b) Based on the flexural test configurations of 3-point bending test and 4-point bending test, suggest the suitable above method to be used for your specimens started with the samples preparation. (10 marks)

- Q4** (a) Examine the main application based on different categories of finish product for consumer and industrial composites made from PMC.
(5 marks)
- (b) Examine the longitudinal and transverse Young's modulus of a unidirectional Glass/Epoxy lamina with a 35 % fiber volume fraction.
(5 marks)
- (c) How would you improve the strength of kayaks at the UTHM lake using different types of reinforcing materials?
(10 marks)
- Q5** (a) Illustrate suitable construction for surf board with a minimum four (4) types of reinforcing materials.
(5 Marks)
- (b) (i) Sail mast carbon/epoxy or "X" arms honeycomb/carbon/epoxy are the composites being used in the Marine Infrastructure applications. Support the statement given that approximately 1/3 of marine applications is now made of composites".
(5 marks)
- (ii) Design and sketch the shape of above mention composite components using your own ideas.
(10 marks)

- Q6**
- (a) Identified the factors that may affect composite properties based on particulate and fibrous' aspect ratio
(5 marks)

 - (b) Identified the factors that may affect composite properties based on its physical characteristic.
(5 marks)

 - (c) Determine the propagation characteristics of crack or delaminations of composites.
(5 marks)

 - (d) Illustrate the micromechanical analysis of lamina by using strength of materials approach.
(5 marks)

-END OF QUESTION-