

# UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME	:	COMPOSITE
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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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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)

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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.

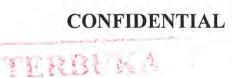
(5 Marks)

(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)



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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)

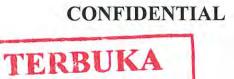
(c) Determine the propagation characteristics of crack or delaminations of composites.

(5 marks)

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

(5 marks)

-END OF QUESTION-



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