

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME

: IC PACKAGING

COURSE CODE

: BEJ 43503/ BED 41103

PROGRAMME CODE : BEJ

EXAMINATION DATE :

JANUARY/ FEBRUARY 2022

DURATION

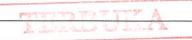
4 HOURS

INSTRUCTION

: 1. ANSWER ALL QUESTIONS.

2. THIS FINAL EXAMINATION IS A **ONLINE** ASSESSMENT AND CONDUCTED VIA OPEN BOOK.

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES



Q1	(a)	(i)	Briefly explain the microsystem and microelectronics packaging. (7 marks)
		(ii)	Imagine you are one of the package design engineers and you have a functional ICs that will be ready soon to be packaged. Explain at least FIVE (5) important criteria or requirements that should be taken or fulfilled before packaging the ICs. (10 marks)
	(b)		Gordon Moore predicts that the transistors on a chip double every 24 months. This increased product functionality because of more transistors on the single ICs. Discuss FOUR (4) complexity and challenges in perspective of packaging to support Moore's law.
			(8 marks)
Q2			tach (also known as Die Mount or Die Bond) is the process of attaching the silicon of the die pad or die cavity of the support structure (e.g., the leadframe) of the onductor package.
		(i)	Explain the process of the Epoxy attach method. (5 marks)
		(ii)	List THREE (3) the common failure mechanisms related to Die Attach process. (3 marks)
	(b)	(i)	Explain and sketch the structure of IC dual-in-line package and label the part of die, wire bonding, bond pad and lead frame. (10 marks)
		(ii)	Analyse the differences between the methods of Thermo-compression and Thermosonic wire bonding. (6 marks)
Q3	(a)	Analyse the similarities and differences of requirements between sealing and encapsulation.	
		•	(10 marks)
	(b)	(i)	Compare Printing Wiring Board (PWB) and Printing Circuit Board (PCB). (9 marks)

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(ii)

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(6 marks)

Analyse the main factors affecting the performance of PWB.

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- Q4 (a) Packaging is needed in all ICs, which are classified into Through-Hole Technology (THT) and Surface Mount Technology (SMT). Both packages have their own unique packaging process flow.
 - (i) Explain **THREE** (3) primary requirements that should be taken into consideration before the IC assembly process.

(6 marks)

(ii) Analyse **FOUR** (4) advantages of Surface Mounting Technology (SMT).

(8 marks)

(iii) Analyse TWO (2) differences between THT and SMT.

(4 marks)

(b) As mold engineer, you are required to design flowchart for the manufacture of a multilayer rigid PWB.

(7 marks)

- END OF QUESTIONS -

