UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020

COURSE NAME	:	RAPID PRODUCT DEVELOPMENT AND MANUFACTURING
COURSE CODE	:	BDD40303
PROGRAMME	:	BACHELOR DEGREE IN MECHANICAL ENGINEERING WITH HONOUR
EXAMINATION DATE	:	DECEMBER 2019 / JANUARY 2020
DURATION	:	2 1/2 HOURS
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS FROM ALL **FIVE (5)** QUESTIONS PROVIDED

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

TERBUKA

Q1   (a)   Rapid Protoyping or Additive Manufacturing is one of the most famous and increasingly adapted technique that is used by most of the manufacturers nowadays. Describe **FIVE (5)** reasons of employing Rapid Prototyping?

(5 marks)

(b)   List only **FIVE (5)** problem occurs due to the bad STL file.

(5 marks)

(c)   Distinguish the process flow of Stereolithograpy (SLA) process. Support your answer with diagram of the process.

(15 marks)

Q2   (a)   Laminated Object Manufacturing (LOM) is one of the Rapid Prototyping process that use solid type material. Its was developed by Helisys Inc. in 1991. Draw the schematic diagram and describe the process flow of LOM.

(10 marks)

(b)   Appraise **FIVE (5)** strength and **FIVE (5)** weaknesses of LOM process. Justify each of your answer.

(10 Marks)

(c)   Distingush **FIVE (5)** application of this LOM process.

(5 Marks)

Q3   (a)   Selective Laser Sintering (SLS) is an Additive Manufacturing (AM) technique that uses a laser as the power source to sinter powdered material. Draw the schematic diagram and describe the process flow of SLS.

(10 marks)

   CONFIDENTIAL

(b) Name the three types of material processing capabilities of the Selectives Laser Sintering (SLS) systems and briefly explain the benefits of each types.

(5 marks)

(c) Appraise **FIVE (5)** strength and **FIVE (5)** weakness of SLS process. Justify each of your answer.

(10 marks)

Q4 (a) Briefly explain, the application of rapid tooling (RT) in investment casting (IC). What are the **THREE (3)** advantages and disadvantages of rapid tooling in investment casting?

(7 marks)

(b) Differentiate between the following types of rapid tooling processes and defend your anwer with appropriate example.

(i) Direct soft tooling

(ii) Indirect soft tooling

(iii) Direct hard tooling

(iv) Indirect hard tooling

(8 marks)

(c) What are the Rapid Prototyping (RP) systems that are suitable for sand casting? Defend your answer by drawing a suitable schematic diagram for RP part in sand casting process.

(10 marks)

Q5 (a) Briefly explain how the preparation of CAD model in Reverese Engineering (RE) is differ from the standard Rapid Prototyping (RP) process and outline the **TWO (2)** methods of preparing the CAD model in RE?

(6 marks)

(b) Describe what are the steps in RE process and the **TWO (2)** area of its applications?

(6 marks)

(c) Evaluate how rapid prototyping (RP) process can be combined and helps to effectively functionalize reverse engineering (RE) process?

(8 marks)

(d) Distinguish **FIVE (5)** advantages of Rapid Tooling?

(5 marks)

- END OF QUESTION –

CONFIDENTIAL