



**UNIVERSITI TUN HUSSEIN ONN
MALAYSIA**

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

COURSE NAME	:	MANUFACTURING TECHNOLOGY
COURSE CODE	:	BDA 30502
PROGRAMME	:	3 BDD
EXAMINATION DATE	:	JULY 2020
DURATION	:	2 HOURS
INSTRUCTION	:	1. ANSWER ALL QUESTIONS IN SECTION A 2. ANSWER TWO (2) QUESTIONS ONLY FROM SECTION B

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

SECTION A

- Q1**
- (a) The pressed powder is known as a green compact. Discuss the properties of green compact in manufacturing concept. (4 marks)
 - (b) Powder Metallurgy (PM) is a metal processing technology in which parts are produced from metallic powders. Describe **FIVE (5)** steps of PM process and give **TWO (2)** product examples of PM (7 marks)
 - (c) Compaction and sintering phase is a process dealing with pressing, heating, diffusion, lattice, vapor transport and etc. Distinguish between compaction and sintering and what is the similarity of both processes? (6 marks)
 - (d) Justify why blending process is required in powder metallurgy? (8 marks)
- Q2**
- (a) There are different ways of categorizing the wide variety of available joining processes. According to classification by the American Welding Society (AWS), joining processes fall into three major categories i.e. welding, adhesive bonding and mechanical fastening. Compare these three various joining methods in terms of their strength and ease of manufacture characteristics. (7 marks)
 - (b) Some types of welding processes can be classified into both fusion and solid-state categories. Distinguish the fundamental process for both categories. (8 marks)
 - (c) Shielded metal-arc welding (SMAW) is one of the oldest, simplest, and most versatile joining processes. About 50% of construction, shipbuilding, pipelines, and maintenance work industrial currently performed by this process. Illustrate and use a schematic diagram to show the equipment and the shielded metal-arc welding process. (10 marks)

SECTION B

- Q3** (a) Describe the major independent and dependent variables that influencing cutting process. (8 marks)
- (b) A 150 mm long with 12.5 mm in diameter of a stainless steel rod is being reduced in diameter to 12.0 mm using a lathe machine. The machine spindle rotates at 400 rpm, and the tool is traveling at an axial speed of 200 mm/min. Determine;
- (i) cutting speed
 - (ii) material removal rate, and
 - (iii) cutting time
- (10 marks)
- (c) Briefly describe and differentiate between the melting process, pouring process and solidifying process in metal casting. (7 marks)
- Q4** (a) Examine **FOUR (4)** properties of mould sands and describe its importance in sand casting. (8 marks)
- (b) After a cast is solidified, it was found that it has defects. By the aid of sketch, distinguish **FIVE (5)** common types of defects that can occur in sand casting process. State the cause of each defect. (10 marks)
- (c) With the aid of a diagram, examine the compression molding process? (7 marks)
- Q5** (a) Compare the Direct and Indirect extrusion works with the aids of diagram. (8 marks)
- (b) In metal forming, there were temperature ranges used including cold, warm and hot working.
- (i) Compare between Hot and Cold working of metals. (6 marks)



- (ii) Discuss the advantages and disadvantages for both processes.
(4 marks)
- (c) In designing and developing new products, engineers need to be aware the design consideration factors for plastic components. Give **TWO (2)** general design consideration factors, **ONE (1)** design consideration for extrusion process and **FOUR (4)** design consideration factors for moulding process.
(7 marks)

- END OF QUESTION -