Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014

COURSE NAME	:	MANUFACTURING TECHNOLOGY
COURSE CODE	:	BDA 30502
PROGRAMME	:	3BDD
EXAMINATION DATE	:	JUNE 2014
DURATION	:	2 HOURS
INSTRUCTION	:	ANSWER **FIVE (5)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) Give **THREE (3)** reasons on why joining process is important.

(3 marks)

(b) List out the different between thermite welding and resistance welding in term of principle and applications.

(5 marks)

(c) With aid of sketch, differentiate the brazing process over the oxyacetylene gas welding on the following

(i) Principle

(3 marks)

(ii) Advantages

(3 marks)

(iii) Disadvantages

(3 marks)

(iv) and applications

(3 marks)

Q2 (a) List down the **THREE (3)** types of conventional machining in material removal processes other than turning and milling operations.

(3 marks)

(b) Two tests were conducted to determine the relationship between cutting speed and tool life. In the first test, a cutting speed of 300 m/min results a tool life of 25 minutes. In the second test, a cutting speed, a cutting speed of 200 m/min which results a tool life 65 minutes. Using Taylor's equation, calculate the following:

(i) Constant n and C.

(3 marks)

(ii) If the life of tool to be extended to 75 minutes, what will be cutting speed tool?

(2 marks)

(c) In an orthogonal cutting operation, the cutting tool has a rake angle of 12°. The depth of cut was 1.25 mm and the chips produced was having thickness of 1.75 mm. The diameter of the work material was 42 mm and rotates at 1200 revolutions per minute. The feed rate of the tool was 0.15 mm/rev. Calculate the following:

(i) Chip thickness ratio

(3 marks)

(ii) Shear plane angle

(3 marks)

(iii) Time taken to turn 125 mm length out of total length of 275 mm.

(3 marks)

(iv) Material Removal Rate (MRR) for 125 mm length of turning

(3 marks)

Q3 (a) Describe the following types of metal casting moulding

(i) Open Mould

(1.5 marks)

(ii) Closed Mould

(1.5 marks)

(b) Define **TWO (2)** advantages and disadvantages for sand casting and investment casting.

(5 marks)

(c) Select the suitable metal casting process in order to produce the casting component shown in Figure **Q3**. Analyze **FOUR (4)** reasons why you have selected this casting process. By using an appropriate sketches, explain how this component can be produced by the selected casting process.

(12 marks)

Q4 (a) List what are the **THREE (3)** various rolling mill configurations available

(3 marks)

(b) In general, outline the **TWO (2)** advantages and disadvantages of hot working and cold working process in metal forming?

(5 marks)

(c) Differentiate direct and indirect extrusion.

(12 marks)

Q5 (a) There are two types of plastic materials. Explain the major differences between these two types of plastic.

(3 marks)

(b) Figure **Q5** is an example of one injection molding machine structures.

(i) Give the name and short explanation for all required components in this figure

(2 marks)

(ii) Explain all four injection molding cycles in producing injection molding plastic parts

(3 marks)

(c) In designing and developing new products, engineers need to be aware the design consideration factors for plastic components. Give and explain **TWO (2)** general design consideration factors, **ONE (1)** design consideration for extrusion process and **FOUR (4)** design consideration factors for molding process.

(12 marks)

Q6 (a) The pressed powder is known as green compact. Describe the properties of green compact.

(3 marks)

(b) Blending powders is the second step in powder metallurgy process. During this process, several hazards are involved

(i) Describe why hazards are involved in powder metallurgy process?

(2 marks)

(ii) State **THREE (3)** precautions that should be considered to prevent the hazard.

(3 marks)

(c) Differentiate between Cold Isostatic Pressing (CIP) and Hot Isostatic Pressing (HIP).

(12 marks)

- END OF QUESTION -

PEPERIKSAAN AKHIR

SEMESTER/SESI : SEMESTER II /2013/2014 KURSUS : 4BDD
NAMA KURSUS : TEKNOLOGI PEMBUATAN KOD KURSUS: BDA30502

Figure **Q3**: Casting components

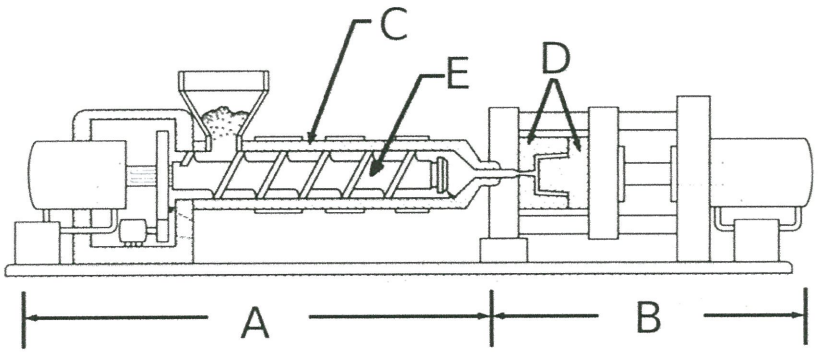

Figure **Q5**: Injection molding machines