Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022

COURSE NAME	:	MANUFACTURING PROCESS
COURSE CODE	:	BPC 22203
PROGRAMME CODE	:	BPB
EXAMINATION DATE	:	JULY 2022
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**. 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 (a) Illustrate the following metal forming processes with appropriate explanation.

(i) Flashless die forging

(5 marks)

(ii) Roll bending

(5 marks)

(b) Explain **TWO (2)** limitations of impression die forging.

(4 marks)

(c) A 350 mm-wide strip 32 mm thick is fed through a rolling mill with two powered rolls with radius of 275 mm. The work thickness is to be reduced to 22.5 mm in one pass at a roll speed of 60 rev/min and average flow stress of 420 MPa.

Calculate the roll force.

(6 marks)

Q2 LTC Electronic Sdn Bhd is a manufacturing subcontractor company specializing in printed circuit board manufacturing assembly and testing. One of the most critical equipment in the factory is Wave Soldering Machine. As illustrated in **Figure Q2**, wave soldering fundamental process includes solder flux spraying and molten solder deliver up through a narrow slot onto the underside of a printed circuit board to connect the component lead wires and form solder joints.

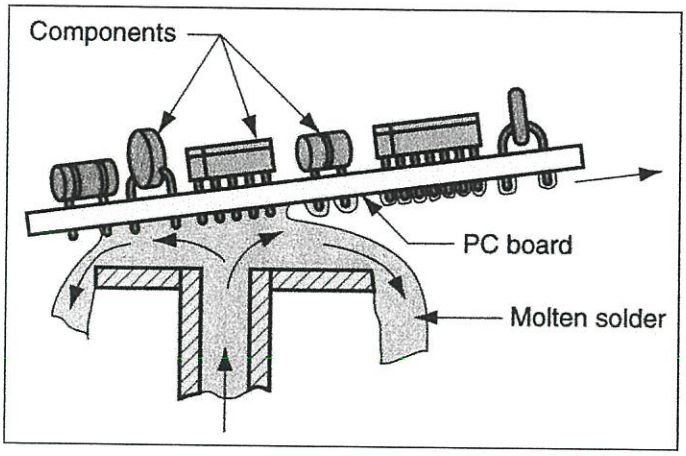

Figure Q2: Wave Soldering Machine

(a) Explain **THREE (3)** main purposes of soldering fluxes.

(9 marks)

(b) Discuss **TWO (2)** advantages of wave soldering process compared to hand soldering method.

(6 marks)

(c) Explain **TWO (2)** typical solder joint defects related to wave soldering process.

(5 marks)

Q3 (a) Illustrate the following machining processes.

(i) Contour turning

(3 marks)

(ii) Chamfering

(3 marks)

(iii) Counterboring

(3 marks)

(b) Explain the function of the following lathe machine components.

(i) Carrier

(2 marks)

(ii) Ways

(2 marks)

(iii) Tailstock

(2 marks)

Q4 (a) Differentiate between electric furnace and atmospheric control furnaces.

(5 marks)

(b) Explain **THREE (3)** purposes of heat treatment.

(6 marks)

(c) Explain electroplating with appropriate illustration.

(5 marks)

(d) List **FOUR (4)** surface texture elements.

(4 marks)

Q5 (a) Explain the working principle of 3D printing with appropriate illustration.

(8 marks)

(b) Explain **THREE (3)** limitations of computer numerical control (CNC) machining.

(6 marks)

(c) Explain **THREE (3)** applications of nanotechnology.

(6 marks)

– END OF QUESTIONS –