Menoufia University Faculty of Engineering, Shebin El-kom Prod. Eng. and Mech. Design Dept 2nd Semester Examination, 2018 -2019 Date : 10 /6/ 2019	Subject: Forming Processes Code: PRE121 Year : First Time Allowed: 3 Hour Total Marks : 90 Marks

جامعة المنوفية
كلية الهندسة - شبين الكوم

Answer all the following questions

استعن بالرسم الدقيق كلما امكن ذلك

QUESTION NO. 1 (18 Marks)

A) In a table with accurate free hand sketches, state the sheet metal-forming processes involved in manufacturing a two-piece aluminum beverage can. (7 marks)

B) Describe the shearing mechanism in sheet metal forming processes (4 marks)

C) Explain clearly with neat sketch the following defects occurring in sand casting process: Misrun - Cold Shot- Shrinkage Cavity- Sand blow- Pin Holes- penetration- Mold shift (7 marks)

QUESTION NO. 2 (18 Marks)

A) Write short notes with neat sketches on the following forging processes: Coining, Heading and Tube Swaging (6 marks)

B) Describe clearly with neat sketches electric arc furnaces used in casting processes stating their advantages (6 marks)

C) Explain briefly with neat sketches the major features of the mold in sand casting process. (6 marks)

QUESTION NO. 3 (18 Marks)

A) Describe briefly the following casting processes (with neat sketches) showing some of their products Investment casting process-vacuum casting process- hot chamber die casting process (9 Marks)

C) What is the main difference between powder metallurgy and other metal forming processes? Describe the flow chart showing the steps involved in making powder metallurgy parts. (5 marks)

D) State briefly the main advantages and limitations of powder metallurgy. (4 marks)

QUESTION NO.4 (18 Marks)

A) In Factories of rolling, why the forming process starts hot then cold (discuss in-detail). (5 marks)

B) Derive the required condition to complete the flat rolling process, or roll bite condition. (5 marks)

C) An aluminum alloy strip 200 mm wide and 25 mm thickness is hot rolled to a thickness of 20 mm. The roll radius equals 200 mm and rotates with 50 pm. Calculate the roll force, torque and power required. The coefficient of friction is 0.3. Take C=172 MPa and m = 0.1. (8 marks)

QUESTION NO. 5 (18 Marks)

A) Describe with neat sketch the main types of extrusion processes. (5 marks)

B) Explain the defects which happen during extrusion process. Name the die material used for hot and cold extrusions. (5 marks)

C) A round billet of diameter 125 mm and length 150 mm made of lead is extruded to a diameter of 50 mm. Calculate the required extrusion force and power. The extrusion process is performed at speed of 50 mm/sec. Take K= 25 MPa and n=0.01. (8 marks)

******** GOOD LUCK**********

Q's No.	Q1	Q2	Q3	Q's No.	Q4	Q5		
Skills	a1-1	a3-1	a19-1	Skills	c7-1	c15-1		
	Knowledge &Understanding Skills				Professional Skills			

Prof. Dr. / Mahmoud Abo-Elkhier & *Dr.* / Ahmed Bahei El-Deen