



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 4 Examination in Engineering: February 2020

Module Number: ME4304

Module Name: Manufacturing Engineering (C-18)

[Three Hours]

[Answer all questions, each question carries twelve marks]

- Q1. a) Explain two advantages and two disadvantages of die casting. [3.0 Marks]
b) Briefly explain the requirements of a good pattern use in sand casting. [3.0 Marks]
c) What is the process called lost waxing method? Explain with suitable sketches. [4.0 Marks]
d) Discuss briefly five applications of casting? [2.0 Marks]
- Q2. a) What are the special features of friction welding? [3.0 Marks]
b) Explain the resistance welding process with neat sketches. [3.0 Marks]
c) Explain the types of oxy-acetylene flames with sketches. [3.0 Marks]
d) List any four welding defects. Explain how they are happened, and actions to be taken to avoid them. [3.0 Marks]
- Q3. a) What are the four major drawbacks of hot working? [2.0 Marks]
b) Explain why metal components produced by forging are preferred when compared to other machining and welding process. [4.0 Marks]
c) Compare the direct and indirect extrusion process with neat sketches. [3.0 Marks]
d) What is wire drawing? Explain the process by giving applications. [3.0 Marks]

- Q4. a) What is the difference between punching and blanking? Explain with suitable sketches. [3.0 Marks]
- b) What are the factors affecting shearing operation? [3.0 Marks]
- c) Define the process of stretch forming? Explain by giving applications. [3.0 Marks]
- d) Formulate the mathematical expression for the flat strip metal rolling process to calculate the minimum requirement to start the process. [3.0 Marks]
- Q5. a) Describe the types of ingredients usually added to metallic powders during blending and/or mixing. [3.0 Marks]
- b) What are the 3 steps in sintering cycle of powder metallurgy (PM)? Explain with suitable sketches. [3.0 Marks]
- c) Why a controlled atmosphere furnace is desirable in sintering? [3.0 Marks]
- d) Explain, why PM Technology well suited to production of gears and bearings? [3.0 Marks]