



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)
MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

SECOND YEAR SECOND SEMESTER

COURSE CODE: TEM 282

COURSE TITLE: MECHANICAL TECHNOLOGY AND PRACTICE II

DATE: 17/4/2023

TIME: 1500-1700HRS

INSTRUCTIONS TO CANDIDATES

- This paper consists of **FOUR** questions
- ANSWER QUESTION **ONE** and any other **TWO** QUESTIONS
- ALL symbols have their usual scientific meanings unless stated otherwise

This paper consists of 4 printed pages Please Turn Over →

Question 1 (30 Marks)

- a) State any FOUR bulk metal deformation process and FOUR sheet metal working processes (4 marks)
- b) By the aid of sketches illustrate the following metal working operations (6 marks)
- V –bending
 - Deep drawing
 - Blanking Operation
- c) State any FOUR advantages of hot working over cold working of metals (4 marks)
- d) With specific sketches, differentiate between flashless forging and Impression die forging (4 marks)
- e) i) Briefly explain the process of riveting (3 marks)
ii) State any THREE types of riveted joints (3 marks)
- f) During arc welding, welding rods coated with flux are used . State any TWO reasons for the use of these fluxes (2 marks)
- g) Study figure Q1 (g), Redraw it and draw the variation of current with time as welding stages varies from (1) to (5) (4 marks)

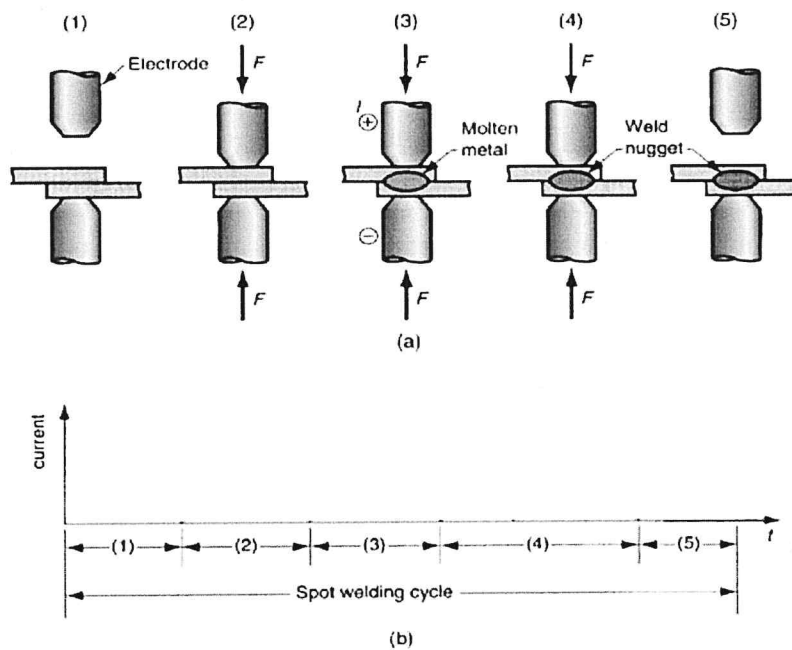


Fig 1(g)

Question 2 (20 Marks)

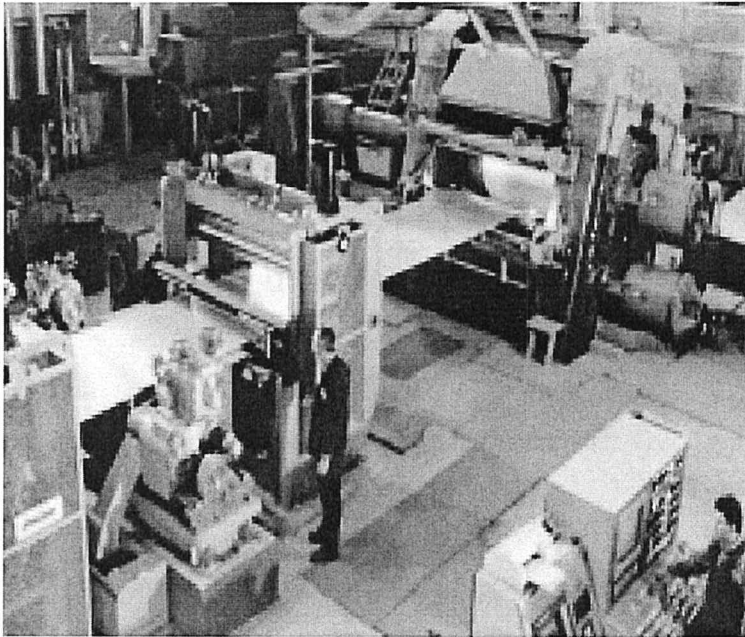


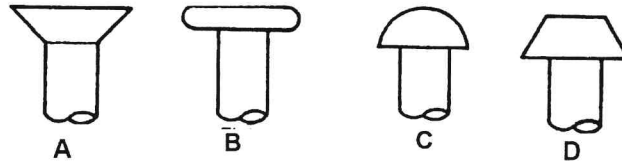
Fig Q 2 (a)

- a) Figure Q2 shows a typical material forming operation. Use it to answer the questions that follows (10 marks)
- i) Identify the manufacturing process shown
 - ii) List any SIX important elements incorporated into the manufacturing line from the coil entry to the end of the process stating one reason for the in-cooperation
 - iii) State any two process that can be performed after the forming operation indicated in the diagram.
- b) A circular blank of diameter 45mm is to be produced from a metal sheet of thickness 1.2mm. given that the shear strength of the metal is 450N/mm^2 (6 Marks)
- i) Determine the blanking die and blanking punch sizes.
 - ii) Calculate the punch force necessary to produce the blank required.
- c) Differentiate between a tandem rolling mill and a continuous rolling mill (4 Marks)

Question 3 (20 Marks)

- a) Name and sketch any THREE sheet metal marking and measuring tools giving the purpose of each (6 Marks)

- b) Name the rivet types drawn and marked A, B, C and D (4 marks)



- c)
- i) define the term soldering (6 Marks)
 - ii) State any TWO Advantages and any TWO disadvantages attributed to soldering
- d)
- i) State TWO alloys used for producing solder metals (4 Marks)
 - ii) State any TWO uses of soldering fluxes.

Question 4 (20 MARKS)

- a) State THREE various flux application methods in arc welding (3 Marks)
- b) By the aid of a well labeled diagram, describe the method of gas metal arc welding process. (7 Marks)
- c) Name any FIVE defects that would be found in weld metal. State one cause of the defect. (5 Marks)
- d) Describe five factors that would lead to high weldability of two metals (5Marks)