

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017****Subject Code: 2162508****Date: 01/05/2017****Subject Name: Metal Forming Technology****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

MARKS

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|------------|--|-----------|
| Q.1 | Short Questions | 14 |
| | 1 What do you mean by Forming of Metals? | |
| | 2 In both slip and twinning the crystals lattice is sheared and plastic deformation takes place. Is it “True” or “False”? | |
| | 3 Which are the process variables in Rolling Process? | |
| | 4 How the folds occur during Rolling Process? | |
| | 5 Define the term Forging. | |
| | 6 Which equipments are used in Forging Process? | |
| | 7 Give the name of components that are produced by Cold Heading. | |
| | 8 Classify various Extrusion processes. | |
| | 9 Which are the drawbacks of Extrusion Process? | |
| | 10 “Drawing is often called Indirect Compression Deformation Process”. Justify the statement. | |
| | 11 How the degree of drawing is measured in drawing? | |
| | 12 Define the term “Extrusion Ratio” | |
| | 13 What do you understand by Ironing of metals? | |
| | 14 What is the application of Stretch Forming Process? | |
| Q.2 | (a) Explain Elastic and Plastic deformation of metal with suitable example. | 03 |
| | (b) Explain the concept of Flow Stresses in Metal Forming with neat sketch. | 04 |
| | (c) Describe Cold Working and Hot Working of metals stating advantages and disadvantages. | 07 |
| | OR | |
| | (c) Classify various Metal Forming Processes. What are the advantages and limitations of Metal Forming Processes over other manufacturing processes? | 07 |
| Q.3 | (a) Describe various Rolling Defects. | 03 |
| | (b) Write a short note on Swaging. | 04 |
| | (c) Sketch and explain the working of “Planetary Rolling Mill”. List out merits and demerits of Planetary Rolling Mill. | 07 |
| | OR | |
| Q.3 | (a) Describe various Forging Defects. | 03 |
| | (b) Classify various Rolling Mills. Compare Two High Rolling Mills with Three High Rolling Mills. | 04 |
| | (c) Consider following conditions: | 07 |
| | 1. Stresses induced in part > yield strength of material | |
| | Stresses induced in part < fracture strength of material | |
| | 2. Stresses induced in part ≥ fracture strength of material | |

Which condition satisfies for following operations? Justify your answer.

- a) Rolling
- b) Forging
- c) Extrusion
- d) Drawing
- e) Sheet metal working (Blanking & Piercing)

- Q.4** (a) Compare Embossing and Coining. **03**
(b) Explain the working of Hydrostatic Extrusion. **04**
(c) Explain Open and Closed Die Forging processes. **07**

OR

- Q.4** (a) Describe the piercing method of making seamless tubes. **03**
(b) What is Bending? Compare Edge bending, V-bending and U-bending. **04**
(c) Compare Direct Extrusion and Indirect Extrusion process with sketch. **07**

- Q.5** (a) Sketch and explain deep drawing. **03**
(b) Explain Tube drawing with a moving mandrel method. **04**
(c) Sketch and Compare Wire Drawing with Rod/Bar Drawing. **07**

OR

- Q.5** (a) Define following terms **03**
1. Blanking
2. Punching
3. Perforating
(b) Discuss advantages and limitations of electro-hydraulic forming process. **04**
(c) Describe “Metal Spinning”. Write its product applications. Differentiate between cold and hot metal spinning. **07**
