

**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**

<b>Q.1</b>	<b>Short Questions</b>	<b>14</b>
	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?	
<b>Q.2</b>	(a) Explain Elastic and Plastic deformation of metal with suitable example.	<b>03</b>
	(b) Explain the concept of Flow Stresses in Metal Forming with neat sketch.	<b>04</b>
	(c) Describe Cold Working and Hot Working of metals stating advantages and disadvantages.	<b>07</b>
	<b>OR</b>	
	(c) Classify various Metal Forming Processes. What are the advantages and limitations of Metal Forming Processes over other manufacturing processes?	<b>07</b>
<b>Q.3</b>	(a) Describe various Rolling Defects.	<b>03</b>
	(b) Write a short note on Swaging.	<b>04</b>
	(c) Sketch and explain the working of “Planetary Rolling Mill”. List out merits and demerits of Planetary Rolling Mill.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Describe various Forging Defects.	<b>03</b>
	(b) Classify various Rolling Mills. Compare Two High Rolling Mills with Three High Rolling Mills.	<b>04</b>
	(c) Consider following conditions:	<b>07</b>
	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**

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