

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018

Subject Code: 2172108

Date: 26/11/2018

Subject Name: Metal Working Processes

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
Q.1	(a) Classify metal forming processes.	03
	(b) Differentiate between cold and hot working.	04
	(c) What is Stress-Strain diagram? Draw sample Stress-Strain diagrams for mild steel and cementite.	07
Q.2	(a) Multiple Choice Questions:	03
	1) A three high rolling mill consists of three rolls placed one above the other. Which of the following statement is correct?	
	a. The upper and middle rolls rotate in the same direction whereas the bottom roll rotates in opposite direction.	
	b. The upper and bottom rolls rotate in the same direction whereas the middle roll rotates in opposite direction.	
	c. The middle and bottom rolls rotate in the same direction whereas the upper roll rotates in opposite direction.	
	d. All the upper, middle and bottom rolls rotate in the same direction.	
	2) A moving mandrel is used in	
	a. Wire drawing	
	b. Tube drawing	
	c. Metal cutting	
	d. Forging	
	3) Cold working of metal increases	
	a. Tensile strength	
	b. Yield strength	
	c. Hardness	
	d. All of the above	
	(b) Briefly explain flow curve for material.	04
	(c) Draw Tresca's yield criteria in two-dimensional stress state and write yield condition for each side of the diagram.	07
	OR	
	(c) Find the relationship between von Mises' yield function and the shear stress on octahedral plane for a state of stress given by three principal stresses.	07
Q.3	(a) Name at least six components that are manufactured by extrusion processes.	03
	(b) What are the benefits of hydrostatic extrusion process?	04

- (c) What is extrusion? Explain different extrusion process and explain role of lubricant. **07**
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- OR**
- Q.3** (a) Why small diameter rolls should be used for rolling very thin sheets? **03**
(b) What is the effect of the following factors on the rolling load? **04**
1) The co-efficient of friction,
2) Forward and backward tension.
- (c) Discuss rolling defects with causes and remedies. **07**
- Q.4** (a) What is the function of flash in forging. **03**
(b) Give the effect of forging on microstructure in comparison with machining and casting. **04**
(c) Compare and contrast open die forging and close die forging. **07**
- OR**
- Q.4** (a) Explain briefly deep drawing process with figure. **03**
(b) With neat sketch discuss stretch forming. **04**
(c) Write short note on workability. **07**
- Q.5** (a) Discuss the effect of strain rate on metal working processes. **03**
(b) What are the common defects observed in wire drawing process? **04**
Explain any one in detail.
(c) With neat sketch explain the types of tube-drawing processes. **07**
- OR**
- Q.5** (a) What are the required properties for die selection? **03**
(b) Define: **04**
1) Bloom,
2) Billet,
3) Slab,
4) Strip.
- (c) Explain recovery, recrystallization and grain growth with structure property relationship graph. **07**
