SLOT: B1+TB1

REG. NO.: 23BME0362

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF MECHANICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

Programme Name & Branch	: B.Tech & Mechanical Engineering
Course Code	: BMEE304L
Course Name	: Metal Forming and Machining
Faculty Name(s)	: Dr. Venkateshwarlu B, Dr. Kishore Kumar Mahato, Dr. Devasri Fuloria, Dr. Anoj Giri
Class Number(s)	: VL2025260102174, 2177, 2178, 2182
Date of Examination	: 18-08-2025
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcome Statements:

  CO 1: Develop the yield criterion and workability behaviors of materials.

  CO 2: Evaluate various bulk and sheet metal forming processes for different functional requirements

Q. No	Question	M	CO	BL
1.	A tensile specimen with a 14 mm initial diameter and 60 mm gauge length reaches maximum load at 90 KN and fractures at 75 KN. The minimum diameter at fracture is 10 mm. Determine (a) Engineering stress at maximum load and the true fracture stress. (b) Engineering strain and true strain at Fracture.	10	CO1	BL3
2.	The state of stress characterized by $[\tau_{ij}]$ is given below. Apply the principles of stress decomposition to separate the given state of stress into its hydrostatic and pure shear components. Also, determine the value of first, second and third invariants of the stress tensor. $[\tau_{ij}] = \begin{bmatrix} 10 & 4 & 6 \\ 4 & 2 & 8 \\ 6 & 8 & 6 \end{bmatrix}$	10	CO1	BL3

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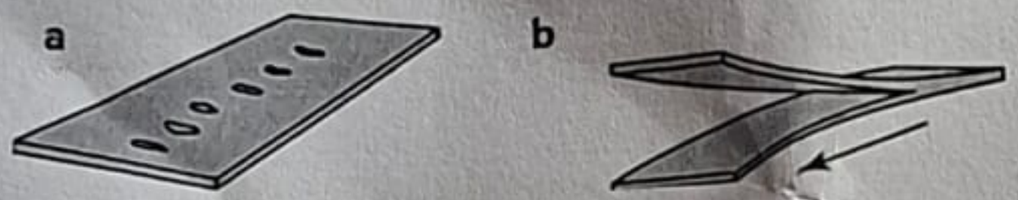
3.	(a) In a cold rolling operation, the plate thickness is to be reduced from 400 mm to 395 mm. The roll diameter is 500 mm, and the coefficient of friction is 0.08. Check the feasibility of the rolling operation in single pass. Suggest the number of passes required to achieve the required reduction in thickness. (5 marks) (b) Identify the following defects and write down the causes. (5 marks) 	10	CO2	BL4
4.	Explain the different configurations of rolling mills with neat sketch.	10	CO2	BL3
5.	Distinguish the tube extrusion and tube drawing operation for the manufacturing of hollow tube.	10	CO2	BL4