

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: PROD**

**SEMESTER: V
SESSION: MO/2022**

SUBJECT: PE301 MANUFACTURING PROCESSES-II

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 25.
 2. Candidates may attempt for all 25 marks.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. The missing data, if any, may be assumed suitably.
 5. Tables/Data handbook/Graph paper etc. to be supplied to the candidates in the examination hall.
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			CO	BL
Q1 (a)	Define shear plane and shear angle in orthogonal metal cutting.	[2]	CO1	BL1
Q1 (b)	Relate frictional force in terms of cutting force and thrust force.	[3]	CO1	BL2
Q2	An orthogonal cutting operation is being carried out under the following conditions: depth of cut = 0.10 mm, the width of cut = 5 mm, chip thickness = 0.2 mm, cutting speed = 2 m/s, rake angle = 10° , cutting force = 500 N, and thrust force = 200 N. Calculate the percentage of the total energy that is dissipated in the shear plane during cutting.	[5]	CO1	BL2
Q3 (a)	Analyze and explain which tool materials would not be particularly suitable for interrupted cutting operations.	[2]	CO2	BL4
Q3 (b)	Explain the mechanism of discontinuous chip formation. What is BUE?	[3]	CO2	BL2
Q4 (a)	Analyze how cutting fluids have adverse effects in machining.	[2]	CO2	BL4
Q4 (b)	Explain the mechanism of how tools wear.	[3]	CO2	BL2
Q5 (a)	Explain the use of a lathe mandrel.	[2]	CO2	BL2
Q5 (b)	Consider a lathe machine without a taper-turning attachment. You are required to turn a small taper over a long job. Evaluate and tell if this can be done. If so, then how?	[3]	CO2	BL5

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