

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

CLASS: B.Tech.
BRANCH: MECH

SEMESTER : III
SESSION : MO/2025

SUBJECT: PE24297 MANUFACTURING PROCESSES

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
-

		CO	BL
Q.1(a) Casting is the oldest manufacturing process, still significant to produce various products - Justify it.	[2]	3	3
Q.1(b) Given a top gated mold with the following: Sprue height, $h_t = 20$ cm, Cross-section of sprue base, $A_3 = 2.5$ cm ² , Volume of mold cavity, $V = 1560$ cm ³ Find: a) Flow velocity at sprue base b) Flow rate of metal into mold cavity c) Mold filling time	[3]	4	3
Q.2(a) What are the applications of investment casting?	[2]	1	2
Q.2(b) Compare true centrifugal casting, semi centrifugal casting and centrifuging processes based on working principle and product manufactured.	[3]	1	3
Q.3(a) What are the significance of various rake angles in single point cutting tool?	[2]	2	2
Q.3(b) The cutting force and thrust force have been measured in an orthogonal cutting operation to be 300 N and 291 N, respectively. The rake angle = 10° , width of cut = 0.200 mm, chip thickness before the cut = 0.015 mm, and chip thickness ratio = 0.4. Determine (a) shear strength of the work material and (b) coefficient of friction in the operation.	[3]	4	3
Q.4(a) State Taylor's tool life equation and mention the significance of the factors involved in it.	[2]	1	2
Q.4(b) Classify chip formation considering workpiece material and cutting parameters.	[3]	2	2
Q.5(a) Enlist various operations that can be performed on a lathe machine.	[2]	1	2
Q.5(b) What do you mean by turret lathe? How can you specify a lathe machine?	[3]	1	2

:::::24/09/2025 :::::E