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

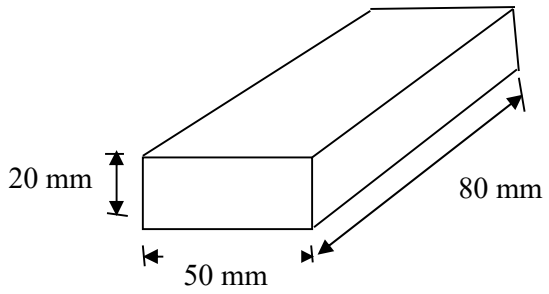
CLASS: B.TECH. **SEMESTER: III**
BRANCH: Mechanical Engineering **SESSION: MO/2025**

SUBJECT: PE24297 MANUFACTURING PROCESSES

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	A job shown in the figure is to be made of steel by casting process. The mould for the job to be made from a wooden pattern. Determine the dimensions of the wooden pattern. Assume machining allowance of 2 mm on each side, shrinkage allowance of 2% and a draft allowance of 1^0.	5	4	3



Q.1(b)	Differentiate between hot chamber and cold chamber die casting. Show the set-up for both the processes with suitable diagram.	5	1	4
Q.2(a)	With a neat sketch, show the geometry of a single point cutting tool? When do you prefer ceramic tools over HSS tool?	4+1	1	2
Q.2(b)	An orthogonal cutting operation is performed using a rake angle of 15°, chip thickness before the cut = 0.012 mm and width of cut = 0.100 mm. The chip thickness ratio is measured after the cut to be 0.55. Determine (a) the chip thickness after the cut, (b) shear angle, (c) friction angle, (d) coefficient of friction, and (e) shear strain.	5	4	3
Q.3(a)	Describe various types of drilling operations with suitable figures.	5	1	2
Q.3(b)	Specify grinding wheel with an example. What is centerless grinding?	4+1	1	2
Q.4(a)	Compare hot working and cold working in the context of material deformation process. Mention specific applications of upset forging and deep drawing operations.	3+2	2,3	4
Q.4(b)	What are the different rolling mill arrangements seen in industries? What is the significance of neutral point in rolling operation? In a rolling operation, a 25mm thick plate can be reduced to a maximum limit of 20mm in one pass. The coefficient of friction between the roll and the plate is 0.14. Determine the diameter of the roll to be used.	2+1+2	4	3
Q.5(a)	Differentiate between metal inert gas (MIG) and tungsten inert gas (TIG) welding. What are the different modes of metal transfer in MIG welding	2+3	1	4
Q.5(b)	What are the different methods of brazing? Distinguish between soldering and brazing process	3+2	1,3	4

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