

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

CLASS: BTECH.
BRANCH: MECH

SEMESTER : III/ADD
SESSION : MO/2024

SUBJECT: PE213 MANUFACTURING PROCESSES

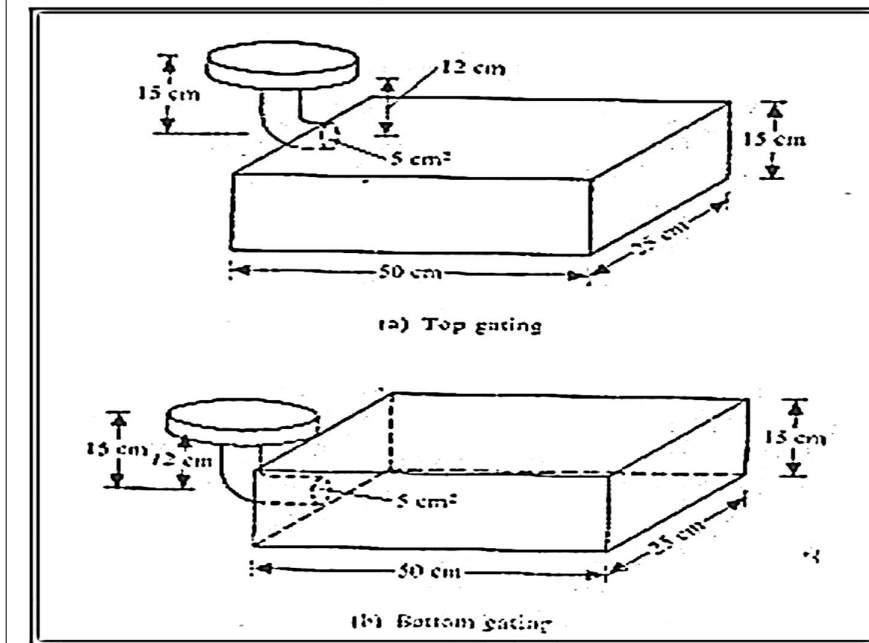
TIME: 3 Hours

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.
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|---|---------|-----------|---------|
| Q.1(a) What are the applications of investment casting?
Differentiate between 'hot chamber' and 'cold chamber' die casting processes with suitable figure. | [2+3=5] | CO
2,1 | BL
4 |
| Q.1(b) Find the mould filling time for both the top and bottom gating systems (shown in fig.). Area of cross-section of in-gate is 5 cm^2 . | [5] | 4 | 3 |



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|---|---------|-----|---|
| Q.2(a) The following data from an orthogonal cutting test is available.
Rake angle = 10°
Chip thickness ratio = 0.35
Uncut chip thickness = 0.51 mm
Width of cut = 3 mm
Yield shear stress of work material = 285 N/mm^2
Mean friction coefficient on tool face = 0.65.
Determine the (i) cutting force, (ii) radial force, (iii) normal force on the tool, and (iv) shear force on the tool. Draw the Merchant Circle Diagram. | [5] | 4 | 3 |
| Q.2(b) How many types of tool wear is observed on a single point cutting tool? Explain the Taylor's Tool Life Equation. | [2+3=5] | 1,3 | 2 |

PTO

Q.3(a)	Explain different types of drilling operations with suitable sketch. Differentiate between up milling and down milling.	[3+2=5]	1	4
Q.3(b)	Which manufacturing process is well suited for gear making? How can you specify a grinding wheel?	[1+4=5]	2,1	2
Q.4(a)	What is the basic principle of metal forming? Define: draft and neutral point in the context of rolling process. What is blanking operation?	[1+2+2=5]	1	1
Q.4(b)	Distinguish between direct and indirect extrusion processes. Explain hydrostatic extrusion.	[2+3=5]	1	4
Q.5(a)	What are the process parameters to be controlled in arc welding? Differentiate between MIG and TIG welding processes.	[2+3=5]	1,3	1,4
Q.5(b)	Describe spot welding process with neat sketch. Differentiate between soldering and brazing operations	[3+2=5]	1	4

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