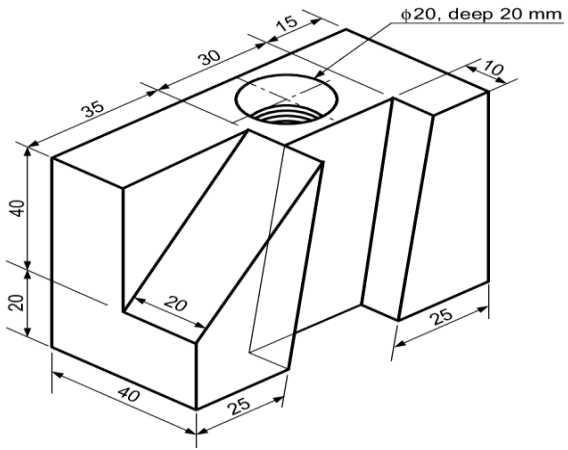


GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3162106****Date:29-05-2026****Subject Name:Foundry Technology****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define the term "founding" and foundry.	03
	(b) Compare and contrast the layout of a modern foundry within an industrial setting, comparing it to historical practices.	04
	(c) Classify foundries based on different criteria such as the types of metals cast (ferrous vs. non-ferrous), casting methods employed, and the scale of production. Provide examples for each classification.	07
Q.2	(a) Classify the pattern making materials. Also, define the scalability of pattern based on pattern material.	03
	(b) What kinds of patterns are employed in foundry operations, and how are they distinct in terms of application and design?	04
	(c) Discuss the advantages and disadvantages of casting methods, focusing on factors such as dimensional accuracy, surface finish, and the occurrence of internal defects, and how limitations impact the overall manufacturing process.	07
	OR	
	(c) Calculate the shrinkage allowance of following steel casting to be produced by wooden pattern and aluminium pattern. Find out the new dimension for both the types of patterns. Consider all the dimensions are in mm. The shrinkage allowance for the steel and aluminium is 21 mm/m and 13mm/m, respectively.	07
		
Q.3	(a) What are the types of sands used in moulding?	03
	(b) What are the constituents are used to prepare the molding sands and how do they affect the characteristics and behaviour of the sand mixture?	04
	(c) What are pattern allowances, and how do they ensure proper dimensional accuracy in castings? Provide examples of pattern allowances and their applications.	07
	OR	
Q.3	(a) Differentiate semi-centrifugal and true centrifugal casting techniques.	03
	(b) What the advantages and limitations are of machine molding compared to manual molding techniques?	04
	(c) Define AFS number and its significance in molding. Discuss the effects of sand distribution on mould properties.	07
Q.4	(a) Draw a gating system sketch and label each part.	03

- (b) Classify risers and elaborate on their function, including a discussion on Caine's method of riser design. **04**
- (c) Define shrinkage and discuss common casting defects, their causes, and methods for elimination. Briefly explain five defects. **07**
- OR**
- Q.4** (a) Explain why the down sprue is tapered. **03**
- (b) Compare and contrast green sand molding and dry sand molding techniques. **04**
- (c) Discuss the thermodynamics of solidification in metal casting, including concepts such as nucleation, undercooling, and dendritic growth. **07**
- Q.5** (a) Describe the role of chaplets in the casting. **03**
- (b) A 200 mm long downspure has an area of a cross section of 650 mm², where the pouring basin meets the downsprue. A constant head of molten metal flow rate is 6.5×10^5 mm³/s. considering the end of the downsprue to be open to atmosphere and acceleration due to gravity as 10^4 mm/s² at its ends, find the area of the sprue at the end. **04**
- (c) Define the pouring basin and discuss its functions. What are the type of gates can be employed in the casting? Describe them with a neat sketch. **07**
- OR**
- Q.5** (a) What is the buoyancy force? Where it will be applicable? **03**
- (b) How cores are made? What is the function of the core in the foundry? **04**
- (c) Explain the concept of constitutional supercooling. **07**
