PVP 23

Code: 23ME6401

II B.Tech - II Semester – Honors Examinations - MAY 2025

ADVANCED METAL CASTING
(HONORS in MECHANICAL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	What is metal casting?	L1	CO1
b)	What is the purpose of bonding material in molding sand?	L1	CO1
c)	What are core sands?	L1	CO2
d)	Why is venting important in mold design?	L1	CO2
e)	Why is feeder location important?	L1	CO3
f)	Define the vector element method in casting.	L1	CO3
g)	Name any two types of gating systems.	L1	CO3
h)	Define gating ratio.	L1	CO3
i)	Define castability analysis.	L1	CO4
j)	What is process-friendly design in casting?	L1	CO4

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	List and explain different casting defects, their causes and remedies.	L2	CO1	5 M
	b)	Discuss the advantages and limitations of metal casting over other manufacturing processes.	L2	CO1	5 M
OR					
3	a)	Describe various molding materials and their properties essential for quality casting.	L2	CO1	5 M
	b)	Explain the importance of sand testing methods such as moisture content, permeability and compressive strength.	L2	CO1	5 M
UNIT-II					
4	a)	Classify the significance of pattern allowances. Explain different types of allowances.	L2	CO2	5 M
	b)	Describe core making. Explain the materials and binders used in core making.	L2	CO2	5 M
OR					
5		Illustrate the design considerations leading to better venting of gases generated by core binders during casting.	L3	CO2	10 M

UNIT-III					
6		Explain the solidification process of pure metals and alloys with neat sketches.	L2	CO3	10 M
OR					
7	a)	Discuss the various solidification shrinkage mechanisms and their effects on casting defects.	L2	CO3	5 M
	b)	Explain the vector element method in solidification analysis and its applications in metal casting.	L2	CO3	5 M
UNIT-IV					
8	a)	Discuss the concept of optimal filling time and explain how it affects casting defects.	L2	CO3	5 M
	b)	Explain different gating system types in detail.	L2	CO3	5 M
OR					
9		Illustrate how the gating system design does optimization and validation.	L3	CO3	10 M
UNIT-V					
10	a)	Explain in detail about the casting process selection.	L2	CO4	5 M
	b)	Explain briefly about conversion cost estimation in casting process.	L2	CO4	5 M
OR					

11	a)	Explain briefly about steps involved in product design and castability.	L2	CO4	5 M
	b)	Explain about castability analysis in detail.	L2	CO4	5 M