Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)
B.E. / B. Tech (Full Time) - END SEMESTER EXAMINATIONS, JUNE 2024
MANUFACTURING ENGINEERING
Semester - IV
MF5401 – CASTING AND WELDING TECHNOLOGY

(Regulation 2019)

Time: 3 hrs Max.Marks: 100

CO 1	Gain basic knowledge in casting.
CO 2	Select suitable casting process for application requirement.
CO 3	Apply gating design and mould design knowledge to overcome defects in casting.
CO 4	Select suitable welding process according to the requirements.
CO 5	Apply metallurgical aspects of welding to overcome defects in welding.

BL – Bloom's Taxonomy Levels
(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	State the significance of parting sand.	2	1	L1
2	Mention the characteristics of drop core.	2	1	L2
3	State the principle of squeeze casting process.	2	2	L2
4	Distinguish between hot chamber pressure die casting process and cold chamber die casting process.	2	2	L1
5	What is meant by directional solidification?	2	3	L2
6	Mention the causes of porosity.	2	3	L1
7	Differentiate TIG welding process and MIG welding process.	2	4	L1
8	State the principle of explosion welding process.	2	4	L1
9	Mention the effects of HAZ in welding process.	2	5	L2
10	What is the significance of post weld heat treatment?	2	5	L2

PART- B (5 x 13 = 65 Marks)

Q. No	Questions	Marks	CO	BL
11 (a)	Describe the construction and working of 'Roll over type machine' (hand molding) with neat sketches.	13	1	L4
	OR			
11 (b.i)	Describe the properties of molding sand.	6	1	L4

(ii)	Describe the construction and working of sand slinger with a neat sketch.	**7**	1	L4
12 (a)	Describe the types of centrifugal casting processes with neat sketches.	**13**	2	L3
	OR			
12 (b)	Narrate the steps involved in investment casting process with neat sketches.	**13**	2	L3
13 (a)	Write a detailed note on the following in the context of riser effect and end effect with suitable examples.			
(i)	Riser feeding distance relationship for plates	**7**	3	L3
(ii)	Riser feeding distance relationship for dual and multiple sections.	**6**	3	L3
	OR			
13 (b)	Describe the construction and working of Cupola furnace with a neat sketch.	**13**	3	L3
14 (a)	Describe the process of Laser beam welding with a neat sketch.	**13**	4	L5
	OR			
14 (b)	Discuss the process of plasma arc welding with neat sketches.	**13**	4	L5
15 (a)	Write a detailed note on different zones in welding process with a neat sketch.	**13**	5	L4
	OR			
15 (b)	Discuss the causes of various welding defects and also suggest remedies to prevent them.	**13**	5	L4

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16. (i)	Suggest a suitable pattern to produce the casting with projections and undercuts. Illustrate the said pattern with a neat sketch.	**6**	1	L5
(ii)	Which type of allowance is preferred if the casting has the form of the letter U, V, T or L? Justify.	**6**	1	L4
(iii)	How does AFS grain fineness number is calculated? Explain.	**3**	1	L5