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

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

MANUFACTURING ENGINEERING

Third Sem

MF 23302, Casting and Welding Technology

(Regulation 2023)

Time: 3 hrs **Max. Marks: 100**

CO1	Imply the techniques to make the pattern, core, and moulding
CO2	Identify the appropriate casting techniques for applications
CO3	Apply the knowledge of gating design and grasp the significance of advances in casting to overcome defects in casting.
CO4	Identify the appropriate welding processes according to the requirements.
CO5	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 (10x2= 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	What are the design advantages of casting?	2	CO1	L1
2	What is the function of core print and chaplet?	2	CO1	L2
3	What is the principle of thixocasting?	2	CO2	L1
4	Why do you get better surface finish in shell moulding compared to sand moulding?	2	CO2	L1
5	What is fettling?	2	CO3	L1
6	Why degassing is important in the casting?	2	CO3	L1
7	What is the function of flux in arc welding?	2	CO4	L1
8	What is the difference between friction welding and friction stir welding?	2	CO4	L1
9	What is meant by hydrogen embrittlement in welding?	2	CO5	L1
10	Distinguish between Brazing and Soldering.	2	CO5	L1

PART- B(5x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

Q. No.	Questions	Marks	CO	BL
11 (a)	What are the common allowances provided on patterns and why? Using neat sketches, explain the various stages of preparation of sand mould.	13	CO1	L1
	OR			
11 (b)	What are the main characteristics, which a good moulding sand should possess? How these characteristics influence the performance of a moulding sand during moulding and casting ?	13	CO1	L1

Q. No.	Questions	Marks	CO	BL
12 (a)	Using neat sketches explain hot-chamber type pressure die-casting process. Compare permanent mould casting with pressure die casting.	13	CO2	L3
	OR			
12 (b)	Using neat sketches, describe the stages of making castings by the investment casting process. Why is the investment-casting process capable of producing fine surface detail on castings?	13	CO2	L3
13 (a)	Using a suitable example, explain the two important relationships that govern the flow of liquid metal in the design of a gating system.	13	CO3	L3
	OR			
13 (b)	What is meant by directional solidification? Using suitable illustrations, explain the methods of accomplishing the directional solidification.	13	CO3	L3
14 (a)	Explain different types of electrodes used in the arc welding processes? Using a neat sketch describe any one type of arc welding process that uses non-consumable electrode.	13	CO4	L4
	OR			
14 (b)	What is the fundamental principle behind resistance welding? Using neat sketches, briefly explain their process and applications in the manufacturing of automotive vehicles.	13	CO4	L4
15 (a)	Describe the formation of different zones during arc welding and explain the parameters that affect the heat affected zone.	13	CO1	L3
	OR			
15 (b)	What is residual stress? What are its effects in welding? Describe various welding defects, their causes and remedies.	13	CO1	L3

PART- C (1x 15 = 15 Marks)
(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16. (i)	A Titanium alloy sheet of size 2000 mm X 1000 mm x 4 mm to be cladded onto a 25 mm thick rolled steel plate of the same size. Choose suitable method of joining and explain the process with a neat sketch.	8	CO4	L6
16 (ii)	When will you adopt preheating and post heating of weldments? What will be the consequence, if it is not adopted?	7	CO5	L5