



Final Assessment Test - April 2026

Course: BMEE302L - Metal Casting and Welding

Class NBR(s): 0992 / 0993 / 0994 / 2813 / 2819 / 2821

Slot: F1+TF1

Max. Marks: 100

Time: Three Hours

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
DON'T WRITE ANYTHING ON THE QUESTION PAPER

CO Statements	
COs	
CO1	Interpret the solidification characteristics for designing gating system.
CO2	Demonstrate working principle of various casting processes.
CO3	Use various melting practices and explore casting defects.
CO4	Apply suitable welding process for different functional requirements.
CO4	Examine weld defects and suggest suitable methods to assess weld quality.

is Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)

Answer ALL Questions
(10 X 10 = 100 Marks)

- Sketch all the components of the gating system and explain their functions briefly. CO1 BL3
Discuss the different types of gating system.
- Identify the casting process suitable in which resin infused sand is used for casting gym equipment like dumbbells as shown Figure 1 and explain the step by step procedure to make them with a neat sketch. Also, mention its advantages and limitations? CO2 BL3



Figure 1

- Identify the casting process suitable for making the hollow product shown in Figure 2 without using any core and explain its step by step procedure with a neat sketch. Also list its advantages, limitations and other applications? CO2 BL3



Figure 2

4. Classify and identify the various furnaces used in foundry industries, and select the furnace that utilizes induction heating for rapid and clean metal heating. Illustrate its working principle with a neat sketch, and explain its advantages and disadvantages. **CO3 BL3**
5. Analyze the welding requirements for the rocket body shown in figure 3 and determine an appropriate welding technique employing a non-consumable electrode. Illustrate and interpret its working Principle with a neat sketch, and evaluate its advantages, limitations, and applications. **CO4 BL4**

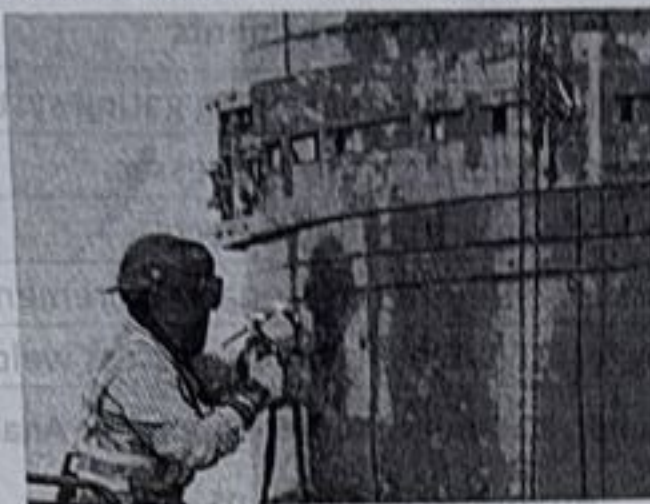


Figure 3

6. Analyze and differentiate the various types of electrodes used in welding, and examine the role of electrode coatings and shielding gases in influencing weld quality and performance. **CO4 BL4**
7. Explain the following welding defects with a neat sketch and also mention the causes for their occurrence and list out the remedial measures to overcome them? **CO5 BL4**
 (a) Excessive concavity & convexity (b) Incomplete fusion (c) Spatter (d) Excessive weld reinforcement.
8. Discuss any one of the contemporary issues that you come across related to welding industries briefly? **CO5 BL4**
- 9.a) Classify risers used in casting based on: (i) Location, (ii) exposure to atmosphere, and (iii) method of filling. Illustrate each type with neat sketches and explain their functions in casting applications. **CO1 BL3**
- OR**
- 9.b) Define gating ratio and classify gating systems based on it. Apply appropriate gating ratios for different casting conditions and differentiate the systems with typical values and applications. **CO1 BL3**
- 10.a) Identify the suitable welding technique for joining railroad tracks in challenging locations and explain its working principle with a neat sketch. Also mention its advantages and limitations? **CO4 BL4**
- OR**
- 10.b) Explain the welding process in which the arc and weld zone are completely covered by a blanket of granular and fusible flux. With the help of clear sketches, discuss its working principle, advantages, limitations and applications. **CO4 BL4**

⇔⇔⇔ F/E/TZ ⇔⇔⇔