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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

Ph.D. (First Semester) Examinations, December – 2024

23SPPEME1013 –Advanced Welding Technology

(Mechanical Engineering)

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

	Answer *ANY FIVE* Questions. (14 x 5 = 70 Marks)	**Marks**
1.a.	Explain the fundamental principles of TIG welding. How does it differ from other arc welding processes in terms of control and versatility?	8
b.	Describe the MIG welding process. What are the key advantages of MIG welding in terms of speed and material compatibility?	6
2.	Explain the resistance welding process. How does it work, and what are the key factors that influence its efficiency and weld quality?	14
3.a.	Explain the advantages of plasma arc welding over conventional arc welding methods.	7
b.	Describe the explosive welding process with suitable sketch.	7
4.	What are the advantages and limitations of hot pressure welding processes? How do these processes ensure strong and reliable welds?	14
5.a.	Explain how friction welding is used in automotive applications.	7
b.	Describe the characteristics of the fusion zone, heat-affected zone (HAZ), and unmixed zone.	7
6.a.	Discuss the concept of dilution in a weld pool. How does the dilution rate affect the composition and properties of the final weld?	7
b.	Write the advantages and limitations of Liquid Penetrant Inspection (LPI)?	7
7.	Explain the tools commonly used in visual inspection. What are the primary applications and limitations of visual inspection in weld and cast component evaluation?	14
8.a.	What factors influence the weldability of stainless steels, and how do these affect the welding process?	7
b.	What is tensile testing in the context of welded joints? Explain how this test is performed and what information it provides about the weld's strength.	7

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