QPC: RN22PHD391 Reg. No | | | | | | | | | | |

GIET UNIVERSITY, GUNUPUR – 765022

Ph.D. (Second Semester) Examinations, November – 2023

WPPEME2032- Advanced Welding Techniques

(Mechanical)

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 meanings of E55RB2L23Fe as per BIS specification for SMAW.	7
b.	Draw the TIG welding setup and discuss the process.	7
2.a.	Give the area of application and advantages of MIG welding.	7
b.	List the different forces that affect the mode of metal transfer in arc welding and describe their role in brief.	7
3.a.	Discuss the working principle of Cold Pressure Welding process with a neat sketch.	7
b.	Describe the construction and working of High frequency Resistance Welding with a neat sketch	7
4.a.	Write short note on i) Electron beam gun ii) Safety in welding iii) Types of joint and welding.	7
b.	With neat labelled sketch explain Plasma Arc Welding. Write its advantages and disadvantages.	7
5.a.	Derive an expression for heat flow in welding.	7
b.	Discuss TTT and CCT.	7
6.a.	Explain the problems encountered with welding of austenitic stainless steels and what are the remedial actions?	7
b.	Explain the process of Needle Arc Micro Plasma Welding.	7
7 a.	Explain the principle and types of visual testing method. Bring out the advantages, Limitations and applications of visual inspection.	7
b.	Discuss about longitudinal magnetization, and circumferential magnetization in magnetic particle testing	7
8 a.	In a given arc welding operation, the power source is at 20V and current is at 300A. If the electrode travel speed is 6mm/s, calculate the cross sectional area of the joint. The heat transfer efficiency is 0.8 and melting efficiency is 0.30. Heat required to melt the steel is $10J/mm^2$.	7
b.	Assume that two 1.5mm thick steel sheets are being spot welded at a current of 5500A and current flow time t=0.15s. Using electrodes 6mm in diameter, estimate the amount of heat generated and its distribution in the weld zone.	7

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