

**COURSE CODE: ME366****COURSE NAME: ADVANCED METAL JOINING TECHNOLOGY**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any three full questions, each carries 10 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | a) Explain the necessity of vacuum environment in Electron Beam welding.                     | (3) |
|   | b) What are the design considerations of Electron Beam welding?                              | (7) |
| 2 | a) Explain how different process parameter influence Laser Beam welding.                     | (7) |
|   | b) Mention the different laser sources in Laser Beam welding.                                | (3) |
| 3 | a) Explain the mechanism of Diffusion bonding.   | (7) |
|   | b) Explain how the surface preparation affects the strength of welding in Diffusion welding. | (3) |
| 4 | a) Explain the welding process used for manufacturing of aluminium and copper wires.         | (6) |
|   | b) Mention the type of Cold welding processes.   | (4) |

**PART B***Answer any three full questions, each carries 10 marks.*

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|---|--|-----|
| 5 | a) Explain the Explosive welding process used for welding tubular geometries.        | (7) |
|   | b) Explain how the stand-off distance affects the weld quality in Explosion welding. | (3) |
| 6 | a) With the help sketches explain the Adhesive bonding process.                      | (6) |
|   | b) List the application of Adhesive bonding process.                                 | (4) |
| 7 | a) List the components in Ultrasonic welding process. Explain its working principle  | (5) |
|   | b) Explain the process variations of Ultrasonic welding.                             | (5) |
| 8 | a) Explain the Vacuum braze joint design.  | (6) |
|   | b) Explain stop off materials in Vacuum brazing.                                     | (4) |

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 a) Explain transferred and non-transferred Plasma Arc welding. (6)  
b) List the applications and advantages of Plasma Arc welding. (4)
- 10 a) Explain the process of Needle Arc Micro Plasma welding. (7)  
b) List the applications of Needle Arc Micro Plasma welding. (3)
- 11 a) Describe the Magnetic Impelled Arc Butt welding used for the manufacturing of thick walled tubes. (7)  
b) What are the difficulties in Wet Under Water welding? (3)
- 12 a) Explain the mechanism of bonding in Friction welding. (6)  
b) How the friction pressure and upset pressure affect the weld quality in Friction welding process? (4)
- 13 a) Explain the working principle of Friction Stir welding. (5)  
b) With sketches explain Inertia Friction welding process. (5)
- 14 a) Explain the process variables of Friction Stir welding. (6)  
b) List the materials which can be welded using Friction Stir welding. (2)  
c) List the tool materials used for Friction Stir welding. (2)

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