



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (R,S) Examinations April 2026 (2019 Scheme)

Course Code: MET372

Course Name: ADVANCED METAL JOINING TECHNIQUES

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | Draw and explain the relationship between beam current and weld penetration in electron beam welding. | (3) |
| 2 | Write three applications of lasers beam welding. | (3) |
| 3 | List three process parameters in diffusion welding and explain the effect of any one on the weld quality. | (3) |
| 4 | Write three factors to be considered while selecting adhesive materials in adhesive bonding. | (3) |
| 5 | Write three merits and demerits of explosive welding. | (3) |
| 6 | Write three merits and demerits of friction welding. | (3) |
| 7 | Write about the principle of brazing. | (3) |
| 8 | List process variables in ultrasonic welding. Explain the significance of amplitude. | (3) |
| 9 | Describe the advantages of underwater welding for joining metals. | (3) |
| 10 | List the major equipment used in Plasma Arc Welding and state their functions. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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|----|--|-----|
| 11 | a) With a neat diagram, explain the working of Electron Beam Welding. | (8) |
| | b) Outline all commonly used joint configurations for LBW, providing diagrams. | (6) |

OR

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|----|--|-----|
| 12 | a) Compare the process characteristics of EBW and LBW. | (7) |
| | b) State safety measures specific to Laser Beam Welding. | (7) |

Module II

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|----|---|-----|
| 13 | a) Explain the operation and principle of diffusion welding with diagrams, highlighting various stages. | (8) |
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- b) Write about joint design considerations in adhesive bonding with applications. (6)

OR

- 14 a) Explain about any three adhesives used in adhesives bonding. (6)
b) Explain the working mechanism of cold pressure welding with a neat sketch. Also write four applications of cold pressure welding. (8)

Module III

- 15 a) Explain the principle and set-up of explosive welding with a neat diagram. List any four types of explosives used. (8)
b) Discuss the differences in mechanism between friction welding and friction stir welding, with relevant applications. (6)

OR

- 16 a) With sketches, explain metal flow phenomena in friction stir welding. (8)
b) Describe process variables of friction welding and their impacts on weld quality. (6)

Module IV

- 17 a) Discuss the operation and key process variables of ultrasonic welding. (8)
b) Write short notes on three types of brazing: torch brazing, furnace brazing, and vacuum brazing. (6)

OR

- 18 a) Explain the basic working of ultrasonic welding process with neat diagram. (8)
b) State differences between brazing and welding based on material, process, and joint strength. (6)

Module V

- 19 a) With neat sketches, compare transferred and non-transferred arc techniques in plasma arc welding. (8)
b) Explain the operation of MIAB welding and its advantages. (6)

OR

- 20 a) Explain process setup and principle of wet and dry underwater welding. (8)
b) Write two merits and two demerits of underwater welding. Also write two applications of underwater welding (6)
