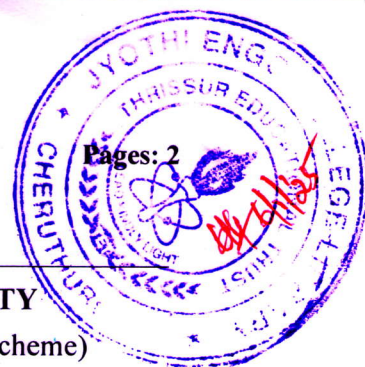


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) Examination December 2024 (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 | Define beam current's role in depth of penetration for EBW. | (3) |
| 2 | What is the purpose of shielding gas in LBW? | (3) |
| 3 | Suggest a suitable adhesive type for bonding a lightweight aircraft component. Explain the reason for your selection. | (3) |
| 4 | What is Impact velocity? How critical is it in creating an explosive weld? | (3) |
| 5 | List three advantages of cold pressure welding. | (3) |
| 6 | Describe linear friction welding. | (3) |
| 7 | Explain furnace brazing. | (3) |
| 8 | State the components of an ultrasonic welding system. | (3) |
| 9 | What are the benefits of MIAB welding? | (3) |
| 10 | Name three risks associated with underwater welding. | (3) |

PART B

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

Module I

- | | | |
|----|--|------|
| 11 | a) With diagrams, explain the principle of Laser Beam Welding (LBW). | (10) |
| | b) Discuss three different types of lasers used in LBW. | (4) |

OR

- | | | |
|----|---|------|
| 12 | a) Explain EBW process variables and characteristics. | (10) |
| | b) Describe the weld joint design commonly used in EBW. | (4) |

Module II

- | | | |
|----|---|------|
| 13 | a) A high-temperature pressure vessel needs to be assembled with minimal distortion. Which welding or bonding process would you recommend? Explain the steps involved, key parameters, and advantages of your choice. | (14) |
|----|---|------|

OR

- 14 a) Explain the cold pressure welding process with a neat sketch. (10)
b) State two applications of cold pressure welding. (4)

Module III

- 15 a) Describe the stages involved in explosive welding with a diagram. (10)
b) Interpret how the testing of explosive weld joint is conducted. (4)

OR

- 16 a) Explain the principles of friction stir welding, using a labelled figure. (10)
b) List two applications of friction stir welding. (4)

Module IV

- 17 a) Categorise different types of brazing operation and explain any two types. (10)
b) List two advantages of vacuum brazing and induction brazing processes. (4)

OR

- 18 a) Describe the working of ultrasonic welding, supported by a diagram. (10)
b) Mention two process parameters in ultrasonic welding. (4)

Module V

- 19 a) Explain the Plasma Arc Welding (PAW) process with a labelled diagram. (10)
b) Describe the principle of operation of MIAB welding (4)

OR

- 20 a) Discuss wet and dry underwater welding methods, using sketches. (10)
b) List two risks and safety measures for underwater welding. (4)
