

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

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) List major components of an Electron Beam Welding Equipment | (2) |
| | b) What are the different degrees of vacuum used in EBW ? | (3) |
| | c) What are the classification of electron beam gun? Explain | (5) |
| 2 | a) Draw schematic of a solid state laser beam and identify the parts | (5) |
| | b) Explain laser beam hazards and safety measures taken in laser beam welding | (5) |
| 3 | a) What is meant by deformation welding? | (2) |
| | b) What are the factors affecting cold pressure welding? | (3) |
| | c) List the advantages of diffusion welding | (5) |
| 4 | a) Explain theory of diffusion welding | (5) |
| | b) Describe the different techniques employed for cold pressure welding | (5) |

PART B

Answer any three full questions, each carries 10 marks.

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|---|--|-----|
| 5 | a) With the help of a diagram, explain explosive welding procedure | (7) |
| | b) List different types of explosives used in explosive welding | (3) |
| 6 | a) With the help of a neat sketch, explain the working of Ultrasonic welding | (7) |
| | b) List major process parameters of Ultrasonic welding | (3) |
| 7 | a) Explain major adhesive bonding theories | (7) |
| | b) List the conditions for satisfactory bonding in adhesive joining | (3) |
| 8 | a) With the help of a neat sketch, explain vacuum brazing | (5) |
| | b) Explain the advantageous and disadvantages of vacuum brazing | (5) |

PART C

Answer any four full questions, each carries 10 marks.

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|---|---|-----|
| 9 | a) Differentiate between wet and dry underwater welding | (5) |
|---|---|-----|

- b) Explain Needle Arc Micro Plasma welding (5)
- 10 a) Explain magnetically impelled arc butt welding process with a neat diagram (6)
- b) List advantages and disadvantages of MIAB welding (4)
- 11 a) Differentiate between plasma arc welding and TIG welding (6)
- b) Explain transferred and non-transferred arc techniques in plasma arc welding (4)
- 12 a) Explain different modes of friction welding (5)
- b) What are the major process parameters in friction welding? (5)
- 13 a) What are the major concerns in designing Friction weld joint? (6)
- b) List major application of friction welding (4)
- 14 a) Explain friction stir welding with the help of a neat sketch (5)
- b) Explain mechanism of bonding in friction stir welding (5)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE(S) EXAMINATION, DECEMBER 2019

Course Code: ME366

Course Name: Advanced Metal Joining Technology

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each question carries 10 marks.

Marks

- | | | |
|---|--|------|
| 1 | a) List out the process parameters which are needed to be controlled during EBW? | (5) |
| | b) What are the main parts of electron gun? List out and explain its functions. | (5) |
| 2 | Explain the different types of Lasers | (10) |
| 3 | a) Describe the theory and principle behind the diffusion welding process | (5) |
| | b) List the key process variables in diffusion welding process | (5) |
| 4 | a) With the help of neat sketch explain the equipment and setup of cold pressure welding | (7) |
| | b) List the advantages of deformation welding | (3) |

PART B

Answer any three full questions, each question carries 10 marks.

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|---|--|-----|
| 5 | a) Compare oblique and parallel explosion welding processes. | (5) |
| | b) List the advantages and limitations of explosion welding process. | (3) |
| | c) Explain the importance of detonation velocity in explosion welding. | (2) |
| 6 | a) With the help of neat sketch explain the failure mechanisms of adhesive bonding | (5) |
| | b) What are the major classifications of adhesive used in adhesive bonding? | (5) |
| 7 | a) Explain the main process parameter in Ultrasonic welding. | (5) |
| | b) Describe the theory and working principle of Ultrasonic welding with neat sketches. | (5) |
| 8 | a) Explain the key features of vacuum brazing furnace. | (5) |
| | b) List the advantages and limitations of Vacuum brazing. | (5) |

PART C

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

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| 9 | a) Explain in detail the equipment and tooling used in Plasma Arc Welding. | (7) |
| | b) Write a short note on Needle Arc Micro Plasma welding. | (3) |
| 10 | a) With the help of a neat sketch explain hyperbaric welding. | (7) |
| | b) List the demerits of underwater welding. | (3) |

- 11 a) Explain the principle of Magnetically Impelled Arc Butt welding process. (5)
- b) Compare transferred and non - transferred arc technique in PAW. (5)
- 12 a) With the help of neat sketch explain the different stages of friction welding. (5)
- b) Describe the influence of process parameters in friction welding. (5)
- 13 a) Explain Influence of Tool Geometry on Material Flow Pattern in Friction Stir (7)
- Welding Process.
- b) List out the materials that can be friction stir welded. (3)
- 14 a) Draw the different shapes of probes used in friction stir welding. (5)
- b) List the application of friction stir welding. (5)
