

III B.Tech. I Semester Regular Examinations, November -2005

**TECHNIQUES OF METAL JOINING
(Metallurgy & Material Technology)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. With a neat sketch explain the principle, theory, mechanism, variables, advantages, disadvantages and fields of application of MIG welding. [16]
2. (a) Explain the relative merits of AC arc welding and DC arc welding.
(b) Discuss the principle, key variables tooling and equipment for plasma arc welding. Also mention its applications. [6+10]
3. (a) Explain the pre and post heat treatment methods for weldments.
(b) Explain the concept and principle of electron beam welding. [8+8]
4. (a) What is HAZ and discuss the various factors affecting it.
(b) Write a note on Laser Welding. [8+8]
5. (a) Explain the terms:
 - i. Heat input
 - ii. Penetration and
 - iii. Dilution
(b) Explain the principle and operation of friction welding process. [6+10]
6. (a) What is weldability? Discuss the parameters that improve weldability.
(b) Distinguish soldering and Brazing in all respects including the fields of applications. [8+8]
7. (a) What are the problems connected with stainless steel welding.
(b) Explain welding of Aluminium and its alloys. [6+10]
8. Write a detailed note on the welding defects and their remedies. [16]

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1. (a) Explain the broad classification of welding process with examples.
(b) Explain the terms:
 - i. Heat input
 - ii. Penetration
 - iii. HAZ
 - iv. Dilution[6+10]
2. (a) Explain the principle and operations of friction welding process.
(b) Explain the different modes of MIG welding process [8+8]
3. (a) What are the problems during welding of Aluminium alloys and how are they over come?
(b) Explain the process of Brazing. [10+6]
4. (a) Explain the detail Arc welding with respect to principle tooling and equipment used.
(b) Mention the advantages, limitations and fields of application. [10+6]
5. (a) Explain the cracking tendency of weld metal and what are the remedies to minimise this.
(b) Name the different types of weld tests. [12+4]
6. (a) Explain clearly the pre and post heat treatment methods for weldments.
(b) Explain the concept and principle of Laser welding. [10+6]
7. Explain the plasma welding with respect to the principle, working, advantages, disadvantages and applications. [16]
8. Write short notes on the following:
 - (a) Joining of dissimilar alloys
 - (b) EMPOR welding
 - (c) Welding of stainless steels
 - (d) Welding stresses. [4X4=16]

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1. Explain the principles, theory, mechanisms and key variables of different welding processes. Also give their field of application. [16]
2. (a) What do you know about the fusion and Heat affected zones?
(b) Describe the different factors affecting the heat affected zone.
(c) Draw and distinguish the micro structures of fusion and HAZ zones in steel. [4+6+6]
3. (a) Explain with a neat sketch the principle and working of MIG welding process.
(b) Explain the key variables, equipment used and fields of application. [10+6]
4. (a) Differentiate spot and Laser Welding processes.
(b) Explain the working principle of Diffusion Welding. [10+6]
5. (a) Explain in detail the problems associated with welding of stainless steels.
(b) Explain welding of copper and its alloys. [8+8]
6. Write an essay on various welding defects, their causes of occurrence and remedial measures to be taken. [16]
7. (a) What is weldability? What parameters need to be considered in improving weldability?
(b) Distinguish between soldering and Brazing. [8+8]
8. Write notes on the following:
 - (a) Oxy acetylene welding
 - (b) Adhesive bonding process
 - (c) Welding of cast Irons
 - (d) Welding of high alloyed steels. [4X4=16]

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1. Write in detail the oxy-acetylene welding with respect to the principle, reaction taking place in each zone and types of flames. [16]
2. (a) What is heat affected zone? Draw its microstructure typical of medium carbon steel and Explain.
(b) Explain with a neat sketch TIG welding process. [8+8]
3. (a) Compare Arc and submerged arc welding.
(b) Write a brief note on welding stresses. [10+6]
4. (a) Explain the working principle of spot welding. Give its advantages and limitations.
(b) Explain how is joining of dissimilar alloys carried out. [8+8]
5. Explain the processes used for welding of
(a) Components of Cu and its alloys
(b) components of Al and its alloys. [8+8]
6. Write an essay on welding defects and their remedies. [16]
7. (a) Distinguish between soldering and Brazing.
(b) Explain the process of Brazing.
(c) Explain the applications of soldering and brazing in regular practice. [6+5+5]
8. Write notes on the following:
(a) Merits of AC arc welding
(b) Weldability of metals
(c) Pre treatment methods for weldments
(d) Electron Beam welding. [4X4=16]
