

**III B.Tech I Semester Regular Examinations, November 2006**  
**TEHNIQUES OF METAL JOINING**  
**(Metallurgy & Material Technology)**

**Time: 3 hours**

**Max Marks: 80**

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

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1. (a) What is welding? Write a detailed account on the history and development of welding techniques.  
(b) Explain the advantages and disadvantages of welding processes. [10+6]
2. (a) Explain the steps involved in the preparation of pieces for gas welding process. Explain how the weld quality is affected by the quality of the edge preparation.  
(b) Name 2 gas welding techniques and, explain their principle and applications. [10+6]
3. (a) What is magnetic arc blow? Explain it. How it is minimized.  
(b) Explain the reasons why damp flux coated electrodes should not be used for welding mild steel materials. [8+8]
4. Describe the electron beam welding process with a neat sketch. Discuss the methods of beam focusing for electron gun. Write the advantages, applications and metals welded. [16]
5. (a) What is 'weld decay' in austenitic stainless steel welds? Explain them.  
(b) What are the principle factors responsible for it? Explain them.  
(c) What are the various methods available to control it? Explain. [5+5+6]
6. (a) What do you mean by weldability?  
(b) Comment on the weldability of aluminium and its alloys.  
(c) Indicate the process selected, problems encountered and the ways of overcoming them. [2+6+8]
7. What are the various welding defects? Explain any four welding defects. What are the reasons for the occurrence of those defects. Suggest the necessary remedial measures. [16]
8. (a) Suggest a suitable method of brazing carbide tips to tool shanks. Give a detailed description of the process.  
(b) What are the important design considerations in brazing process? Explain them in detail. [8+8]

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1. (a) Give a brief history of the development of welding practice and welding industry.  
(b) Differentiate between plastic welding and fusion welding with examples. [10+6]
2. (a) Explain how acetylene gas is stored in the cylinder. Discuss the safety devices incorporated in the cylinder.  
(b) Name various types of flames used in gas welding process. Suggest their specific applications. Draw neat sketches of the flames. [7+9]
3. (a) What is magnetic arc blow? Explain it. How it is minimized.  
(b) Explain the reasons why damp flux coated electrodes should not be used for welding mild steel materials. [8+8]
4. (a) With a neat sketch describe the spot welding process.  
(b) What should be the good characteristics of the spot welding electrodes? Explain. [8+8]
5. (a) What is 'weld decay' in austenitic stainless steel welds? Explain them.  
(b) What are the principle factors responsible for it? Explain them.  
(c) What are the various methods available to control it? Explain. [5+5+6]
6. (a) Why is it difficult to weld copper alloys? Suggest suitable remedies and precautions to weld the same.  
(b) Discuss the difficulties that are encountered during the welding of dissimilar alloys and how to overcome them. [9+7]
7. (a) What do you mean by welding joint. What are the various types of welded joints.  
(b) How are they classified.  
(c) Explain all of them with neat sketches. [5+4+7]
8. (a) Suggest a suitable method of brazing carbide tips to tool shanks. Give a detailed description of the process.  
(b) What are the important design considerations in brazing process? Explain them in detail. [8+8]

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1. (a) What is welding? Write a detailed account on the history and development of welding techniques.  
(b) Explain the advantages and disadvantages of welding processes. [10+6]
2. (a) Distinguish between oxidizing flame, reducing flame in oxy ? acetylene welding. What are their applications.  
(b) Discuss pressure gas welding process in detail. [10+6]
3. (a) List out any Five types of fusion welding processes. Compare them with respect to source of heat energy, applications and advantages.  
(b) Explain how transformer works in arc welding process. [10+6]
4. (a) Explain the resistance spot welding with suitable diagrams for Force Vs time and Current Vs Time. Give the advantages and applications of this process.  
(b) Why is resistance welding called solid state welding process? Write down the sequence of steps involved in resistance spot welding process. [10+6]
5. (a) What is 'weld decay' in austenitic stainless steel welds? Explain them.  
(b) What are the principle factors responsible for it? Explain them.  
(c) What are the various methods available to control it? Explain. [5+5+6]
6. (a) Explain various precautions to be taken in obtaining good welded joints on aluminum pieces.  
(b) What is weldability? What parameters are to be considered in improving weldability? Explain them. [8+8]
7. (a) Explain the various factors that a weldment design engineer must know before or during welding operation.  
(b) Explain the main principles of sound welding design. [9+7]
8. (a) Differentiate fully between welding, brazing and soldering.  
(b) What is a flux? What is the use of a flux in a brazing process? Explain the various fluxes used in brazing process. [8+8]

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1. (a) Write a short notes on different types of welding positions. Give their advantages and limitations.  
(b) Classify the welding processes with proper explanation on the basis of the following.
  - i. Source of heat
  - ii. Type of interaction. [8+8]
2. (a) Distinguish between oxidizing flame, reducing flame in oxy ? acetylene welding. What are their applications.  
(b) Discuss pressure gas welding process in detail. [10+6]
3. (a) What is electrode covering and why are they provided? Explain.  
(b) What is meant by penetration? Explain its relevance in welding process.  
(c) Explain the characteristics of filler welds for thick plates. [6+5+5]
4. (a) With a neat sketch describe the spot welding process.  
(b) What should be the good characteristics of the spot welding electrodes? Explain. [8+8]
5. (a) What is weldability? Explain how and on what basis weldability can be assessed.  
(b) Discuss in detail the welding of stainless steels and other high alloyed steels. [8+8]
6. (a) What do you mean by weldability?  
(b) Comment on the weldability of aluminium and its alloys.  
(c) Indicate the process selected, problems encountered and the ways of overcoming them. [2+6+8]
7. Discuss the importance of design of weld Joints in service life of welds and weld quality. [16]
8. (a) Discuss about soldering of copper and its alloys.  
(b) Explain about the following fluxes used in soldering process.
  - i. Inorganic fluxes
  - ii. Organic fluxes

Code No: RR311805

**Set No. 4**

iii. Rosin fluxes

[6+3+3+4]

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