

Indian Institute of Technology Delhi
Major Examination, II Sem, 2009-2010

Design & Metallurgy of Welded Joints (MEL 778)
Advances in welding (MEL 336)

M. Tech. (Prod. Engg)
B. Tech. (P&I)

Max. Marks: 150

Time: 08.00-10.00 AM

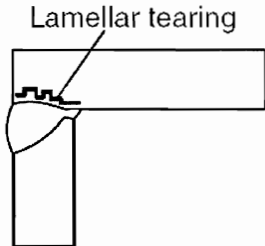
Date: 30.04.2010

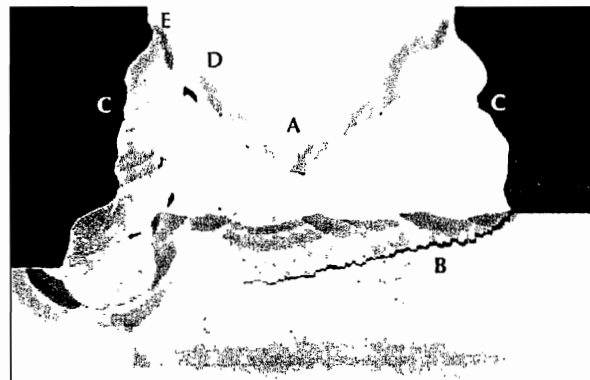
Venue: III-339

PART-A

1. Write short notes on: 5
 - a) How do you estimate the wetting behavior of an alloy on a substrate?
 - b) Specify the role of Titanium in joining oxide and nitride ceramics with metals.
2. Comment on the following statements with suitable justification. 5
 - a) "Service temperature of an active metal brazed joint assembly can be higher than its joining temperature".
 - b) "Making too many welds close to each other in RSW of aluminum provides more strength than intended".
3. With regard to pumping a corrosive fluid, silicon nitride rotor has to be integrated with stainless steel shaft. Explain the problems, and remedies in accomplishing the same. 15

PART-B

1.
 - a) What is lamellar tearing?
 - b) What are the causes?
 - c) What are the practical ways of controlling it?
 - d) In the given design lamellar tearing has been observed. Suggest modification in the design to prevent it.20
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2. Write short notes on: 25
 - a) Epitaxial Growth at Fusion Boundary.
 - b) Competitive Growth in Bulk Fusion Zone.
 - c) Effect of Welding Parameters on Grain Structure.
 - d) Weld Metal Nucleation Mechanisms.
 - e) Grain Structure Control.
 3.
 - a) Identify the various defects depicted in the adjoining figure.
 - b) Discuss the causes and cures of these defects.20



4. True / False statements. Answer all questions by writing true (T) or false (F) in the box provided next to the question. ONE mark would be awarded for each correct answer, but TWO marks would be deducted for each wrong answer. Zero marks would be given for un-attempted questions. Negative marks would be carried forward to the next test. Therefore **ATTEMPT ONLY WHEN SURE.** 60