

III B.Tech II Semester Regular Examinations, Apr/May 2006
FOUNDRY & WELDING
(Production Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain how the green strength, permeability, collapsibility of sands are affected by the following
 - (a) Grain size
 - (b) Grain shape
 - (c) Grain size distribution
 - (d) Nature of sand

[4+4+4+4]
2. (a) Is it, Possible to obtain a sound casting of a solid bar by centrifugal casting Process? Give reasons in support of your answer.
(b) Explain why most die castings not made out of high strength materials?
(c) 'Large parts can't be manufactured by the Centrifuging process'. Comment on the statement.

[5+5+6]
3. (a) Explain various types of risers with their advantages and limitations.
(b) Explain with neat sketches different types of ingates.

[8+8]
4. (a) What are the design considerations to obtain a good welded Joint.
(b) Show by means of a labelled sketch one type of Joint preparation used to control pick-up effects when making a butt welded Joint in clad steel. [8+8]
5. (a) Explain the advantages and disadvantages of braze welding.
(b) Write the important applications of braze welding.
(c) Explain the braze welding of malleable Iron.

[6+5+5]
6. (a) Explain the economics of welding as compare to costing process.
(b) Explain the oxygen lance cutting process with a diagram and give the application.

[8+8]
7. (a) Discuss the structure of polymers giving examples for different types of structures.
(b) Discuss the various types of additives used in polymers. Give their function and example for each type of additive.

[8+8]
8. (a) Explain briefly the basic steps in Powder Metallurgy process.
(b) What is powder metallurgy? What are its advantages and disadvantages.

[8+8]

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1. (a) Differentiate between Green sand and Dry sand processes in the method of making and applications.
(b) Explain the advantages and disadvantages of metal as the pattern material. Which is the most commonly used material for patterns. [8+8]
2. What are the possible casting defects that may be caused by the improper gating system design? State at least 4 defects. Explain the reasons for the defects and suggest suitable remedies. [16]
3. (a) Explain various types of risers with their advantages and limitations.
(b) Explain with neat sketches different types of ingates. [8+8]
4. (a) Discuss the distribution of Micro hardness and residual stresses along the weld zone of a V butt Joint and the methods of offsetting them.
(b) Discuss the nature of residual stresses in a fusion weldment Differentiate their occurrence in square butt Joint and V butt Joint. [8+8]
5. (a) Explain with a neat sketch principle of spot welding.
(b) Distinguish between gas welding and arc welding. [8+8]
6. (a) Explain the reasons for estimating welding costs.
(b) Discuss the factors involved in welding costs. [8+8]
7. (a) Explain the good practices in the design of molded plastic parts.
(b) What are main advantages of injection molding for thermoplastic parts as compared with hot compression molding. [8+8]
8. (a) What are the Various powder making techniques available? Explain in detail the manufacture of metal powders by atomization method.
(b) Compare and contrast powder metallurgy with hot forging. [10+6]

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1. (a) Explain why ramming obtained in sand slingers are more uniform over the depth than that in sand squeezers or Jolting machine?
(b) Define the term pattern. Explain how patterns differ from the drawing of the castings. [8+8]
2. (a) Draw with a neat sketch of cupola label the principle sections of the furnace. Describe briefly it's operation.
(b) Define efficiency of cupola. How is can be improved.
(c) Discuss the factors on which the melting capacity of a cupola depends.[8+4+4]
3. (a) Explain various types of risers with their advantages and limitations.
(b) Explain with neat sketches different types of ingates. [8+8]
4. What is welding? What are the advantages and disadvantages of welding? Write a detailed account on the history and development of welding technique. [16]
5. (a) Explain the principle of blaze welding process in detail.
(b) Describe the common features between blaze welding process and brazing process. [8+8]
6. (a) Explain the economics of welding as compare to costing process.
(b) Explain the oxygen lance cutting process with a diagram and give the application. [8+8]
7. (a) What are the various components which make up a molding compound for plastics and Explain the function of each.
(b) What is hot compression molding? For what type of work these are used.
(c) Explain the principle advantages of the casting method of molding plastic parts. [8+4+4]
8. (a) Define and explain the term powder Metallurgy.
(b) What are the important advantages, disadvantages and limitations of powder Metallurgy?
(c) Explain in detail the sequence of operations is powder Metallurgy. [5+6+5]

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2. Give the basic purposes of melting and describe the Sequential steps followed in using Cupola. In what ways the melting in cupola differs from other types of melting furnaces? State how the metals to charge the cupola are selected. [16]
3. (a) 'Generally risers are required for grey iron casting'. Comment.
 (b) What do you mean by riser efficiency? Explain.
 (c) Discuss the limitations of Chene's method. How do you eliminate the limitations in other methods? [5+5+6]
4. (a) Explain the factors to be considered in selection of weld joint.
 (b) Explain various welding positions.
 (c) Explain various types of welds with neat sketches. [4+4+8]
5. (a) Explain the principle of resistance welding with neat sketch.
 (b) What metals may be spot welded? Can dissimilar metals be spot welded. [8+8]
6. Calculate the total cost of manual flux shielded metal arc welding using the data given below.

Weld length	: 2 metres
Welding speed	: 12 M/hour
Operating factor	: 30%
Labour and overhead charges/hour	: Rs. 5
Electrode consumption	: 0.35 Kg/m.
Electrode price	: Rs. 20 per Kg.
Arc voltage	: 22 Volts
Arc current	: 200 Amps.
E (Efficiency)	: 0.6
Rate/KW Hr.	: Rs. 0.40.

[16]
7. (a) Discuss the structure of polymers giving examples for different types of structures.

- (b) Discuss the various types of additives used in polymers. Give their function and example for each type of additive. [8+8]
8. (a) Explain briefly the basic steps in Powder Metallurgy process.
- (b) What is powder metallurgy? What are its advantages and disadvantages. [8+8]
