

III B.Tech. II Semester Regular Examinations, April/May -2005
FOUNDRY & WELDING
(Production Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain with a neat sketch the working of a Sand slinger moulding machine.
(b) State the advantages and disadvantages of plaster moulds? What is Gypsum plaster mould. What are the advantages of its use as moulding material.
2. What are the defects caused by the molten metal? Explain why they are formed? How these defects can be avoided or minimized?
3. (a) Write short notes on the following:
 - i. Air aspiration effect
 - ii. Whirl gate.(b) Explain the various methods available for trapping slag in pouring basin.
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
5. (a) Explain the principle of arc welding.
(b) Compare the merits and de-merits of using AC and DC for arc welding.
6. (a) State two methods used for gas cutting bevels on plate edges in preparation for welding.
(b) What is meant by 'oxygen lance cutting'? Give two examples of its use.
(c) Describe how cast Iron can be cut by the oxy-fuel gas cutting process.
7. (a) Distinguish between the thermoplastics and thermosetting plastics.
(b) Select the suitable raw material and manufacturing process for any two common plastic components, explain the reasons.
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 in powder Metallurgy.

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1. Explain clearly how the following sands differ from each other with respect to ingredients and properties.
 - (a) Facing sand
 - (b) Backing/Filling sand
 - (c) System sand
 - (d) Parting sand
 - (e) Core sand
2. With the help of a neat sketch, explain the process of shell moulding. Give its advantages and limitations. For what applications it will best fit. Justify your answer with suitable example.
3.
 - (a) Suggest & Explain methods to get uniform grain size in a casting having thick and thin sections.
 - (b) Distinguish fully among the following:
 - i. Liquid contraction
 - ii. Solidification contraction
 - iii. Solid contraction.
4.
 - (a) Explain the various factor that a weldment design engineer must know before or during welding operation.
 - (b) Explain the main principles of sound welding design.
5.
 - (a) Explain the effect of polarity on penetration in DC arc welding.
 - (b) Explain the principle of gas welding.
6.
 - (a) Explain the reasons for estimating welding costs.
 - (b) Discuss the factors involved in welding costs.
7.
 - (a) Distinguish between the thermoplastics and thermosetting plastics.
 - (b) Select the suitable raw material and manufacturing process for any two common plastic components, explain the reasons.
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.

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1. (a) Explain a core blower and mention the essential requirements for its efficient operation.
(b) Discuss the essential properties of a core.
(c) Explain the manual method of core making.
2. (a) Discuss the various factors to be considered for die casting design.
(b) Compare the hot chamber and cold chamber methods of Die casting with respect to operation, advantages, limitations and applications.
3. (a) What are the factors through which directional solidification of castings can be controlled?
(b) What are the advantages of blind riser over conventional type riser?
(c) What are the various elements that comprise of the gating system?
4. What are the various types of welding Joints? How are they classified? Explain all of them with neat sketches.
5. (a) Explain the principle of resistance welding with neat sketch.
(b) What metals may be spot welded? Can dissimilar metals be spot welded.
6. (a) Explain the reasons for estimating welding costs.
(b) Discuss the factors involved in welding costs.
7. What do you mean by moulding of plastics? What are four basic molding methods? With the help of a neat sketch explain the injection molding process. What are the advantages and limitations of the above process.
8. (a) Combination of metal & non - metal (not obtainable by other methods) can be processed by powder Metallurgy only. Giving examples explain briefly
(b) Define sintering and discuss Various stages of sintering

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1. (a) Why is it necessary to carry out testing of sands? Enumerating various tests, Explain their importance and Justification/Usefulness in foundry practice.
(b) With a neat sketch explain stack molding.
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.
3. (a) Why sprue's are made tapered? Explain its importance.
(b) Sketch a gating system and label various components of the system.
(c) Why spherical risers are considered as ideal for risers?
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
5. (a) Explain the effect of polarity on penetration in DC arc welding.
(b) Explain the principle of gas welding.
6. (a) Explain the reasons for estimating welding costs.
(b) Discuss the factors involved in welding costs.
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. (a) Which method will you recommend for the manufacture of the following powders of the metals and why?
 - i. Fe
 - ii. Mg
 - iii. W
(b) What is sintering? What conditions must be satisfied for obtaining a good sintered product?
