

II B.Tech. I Semester Regular Examinations, November -2008
PRODUCTION TECHNOLOGY
(Common to Mechanical Engineering, Mechatronics and Automobile Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Write the basic steps of the casting process.
(b) Sketch a common gating system. Label it and explain the function of its various elements.
(c) Briefly explain the procedure to be followed for making a sand mould. [4+7+5]
2. (a) Describe the need of investment casting. Explain in detail the investment casting process.
(b) Write the advantages, limitations and applications of investment casting. Sketch and explain the process of investment casting. [8+8]
3. (a) Write the advantages and drawbacks of 'welding processes'.
(b) Explain various methods available for oxy-acetylene gas cutting in industrial practice. [7+9]
4. (a) What are the differences between TIG and MIG welding processes?
(b) Explain destructive and nondestructive testing of welds. [8+8]
5. (a) Explain the phenomenon of recovery, recrystallisation and grain growth.
(b) Compare the properties of metals while they undergo recovery, recrystallisation and grain growth. [8+8]
6. (a) Differentiate between blanking and piercing operations. How do you provide shear in blanking and piercing operations.
(b) Sketch and explain wire drawing and tube drawing. Derive an expression for force in wire drawing. [8+8]
7. (a) Differentiate between forward and backward extrusion processes. What is the effect of friction in each of these processes?
(b) Sketch and explain forging hammers and presses. What are the advantages of press forging over drop forging? [8+8]
8. (a) Discuss on the processing of plastics and their applications.
(b) Sketch and explain injection moulding process, equipment and its applications. [8+8]

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1. (a) What are the advantages of casting process? Mention its applications.
(b) Explain briefly the various pattern allowances.
(c) What is gating ratio? How are in gate position and size determined? [6+4+6]
2. (a) Explain the formation of shrinkage cavities in steel castings. How do you eliminate/reduce them?
(b) Write the advantages, limitations and applications of centrifugal casting. [8+8]
3. 'Two plates were welded together and then the strength of the joint was tested. It was found that the weld was stronger than either of the plate'. Do you think that the above statement is incorrect? Comment, giving valid reasons. [16]
4. (a) Explain with the help of neat sketches the induction welding and explosive welding processes and mention their applications.
(b) Describe the types of defects occurring in various welding processes. Explain the causes and remedies. [8+8]
5. (a) Give the comparison between cold working and hot working processes.
(b) Define rolling? Explain the principle and mechanism of rolling. [8+8]
6. (a) Discuss the principles of theory of bending? What are the design parameters of bending operation?
(b) Differentiate between coining and embossing operations. Suggest the presses used for these operations. [8+8]
7. (a) What is hot extrusion? Sketch the variation of extrusion force with temperature.
(b) Sketch and explain roll forging. Differentiate between roll forging and rotary forging. [8+8]
8. (a) What are the advantages of plastics over non plastic materials? Discuss.
(b) Discuss plastic processing methods and their specific advantages.
(c) Differentiate between thermosetting and thermoplastic materials. [5+6+5]

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1. (a) Explain briefly with neat sketches the 'mould making' process.
(b) Why casting is preferred over other manufacturing methods? Discuss.
(c) Explain the function of chaplets used in foundry. [6+6+4]
2. (a) What precautions should one take while choosing chills?
(b) Name few special casting processes and mention their applications.
(c) Differentiate between crucible melting and cupola operation. [5+6+5]
3. (a) What is filler metal? Explain its importance in welding, giving its composition.
(b) Explain the forge welding process and its applications.
(c) Explain the cutting of ferrous and non ferrous metals. [6+5+5]
4. (a) Explain the relationship between the shielding gas used and the type of metal transfer occurring in GMAW process.
(b) Explain the principle of operation of laser welding. Mention its applications. [9+7]
5. (a) Sketch and explain the types of rolling mills and mention their specific applications.
(b) How do you estimate torque and power in rolling? Explain. [9+7]
6. (a) Explain cold and hot spinning and their applications.
(b) How do you provide clearances in blanking and piercing operations?
(c) Derive an expression for minimum diameter of piercing? [5+6+5]
7. (a) What is rotary forging and what is its applications?
(b) Sketch and explain impact and hydrostatic extrusion processes and their advantages.
(c) What is machine forging and mention its applications? [4+7+5]
8. (a) How are plastics classified? Explain.
(b) What is blow moulding? Explain with the help of a neat sketch.
(c) What are compounding materials? Explain. [5+6+5]

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1. (a) What do you mean by the term 'casting'? Mention its advantages and disadvantages.
(b) Enumerate the various types of commonly used patterns and mention their applications.
(c) State the typical applications of casting process as used in automobile sector. [6+5+5]
2. (a) What purpose is served by the risers in sand casting? Explain the principles of design of risers.
(b) With the help of a diagram, explain the working of a Cupola. [8+8]
3. (a) What is flux? Why is it essential to use in some welding situations?
(b) Explain the principle of operation of resistance welding, types and applications. [8+8]
4. (a) What is friction welding? What are its applications?
(b) Explain the heat affected zones in welding. How do you reduce heat affected zones in welding? [8+8]
5. (a) What is meant by strain hardening? Sketch and explain the variation of mechanical properties during strain hardening.
(b) Explain the various rolling processes and variety of products obtained in rolling. [8+8]
6. (a) Differentiate between shallow and deep drawing? What is the effect of blank holding force in deep drawing?
(b) What are the types of drawing? Sketch the types (rod, wire and tube) and mention their processing parameters. [8+8]
7. (a) What is extrusion ratio? What is its value for aluminium and steel products and cold and hot extrusion processes?
(b) Discuss the types of forging and mention their applications. [8+8]
8. (a) What are thermoplastic materials? How do they differ from thermosetting materials?

- (b) What are the characteristics/properties of plastics which make them suitable for number of applications? [8+8]
