QUESTION BANK OF MP-II

INTRODUCTION

- List the various manufacturing processes. Discuss various factors involved for selection of manufacturing process for producing a given component.

CASTING AND FOUNDRY

- With the help of neat sketch, explain the process of preparing a sand mould by the hand moulding method.
- Explain the following with neat sketch:
  (i) Core print  (ii) Sweep pattern  
  (iii) Match plate pattern  (iv) Draft allowance.
- State the ingredients of moulding sand and explain the method used for determining the permeability of any moulding sand.
- Discuss: (i) Precision investment casting. (ii) Centrifugal casting.
- List the various pattern materials. Explain any two along with their advantages and limitations.
- Define following terms
- Explain precision investment casting stating its advantages, limitations and applications.
- List any two casting defects and give their causes and remedies.
- Sketch the cross section of a sand mould which is ready for pouring and label the important parts.
- Differentiate between hot chamber and cold chamber die casting.
- Explain centrifugal casting process. What is the main difference between semi-centrifugal and centrifuging casting process.
- Calculate the optimum pouring time for casting whose mass is 20 kg and having an average section thickness of 15mm. the material of the casting are grey cast iron and steel. Assume K=0.7.
- Explain blow molding process stating its advantages, limitations and applications.
- What is pattern? List different types of patterns and explain any two with neat sketch.
- Explain the following:
  (i) Rapping allowances  (ii) Distortion allowances
- List factors which affect salvaging of casting. Also list various salvage techniques of casting and explain any one.
- Discuss: (i) Shell Moulding (ii) Die Casting
- Explain the properties of moulding sand
- Explain what is meant by term Inserts, and explain where they are of use in plastic moulding. Sketch a typical component showing the position of the Inserts and explain their purpose.
- State the types of furnaces used in foundries. Discuss in brief the working of electric furnace
- State the principle of centrifugal casting and explain its working with neat sketch. Give its advantages
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- What is gating system? What are its functions? State types of gate with it advantages.

METAL JOINING

- Write the functions of flux used in some welding processes.
- Explain the advantages of oxy-acetylene gas welding technique.
- Explain the TIG and MIG arc welding. Give the application of each.
- Explain the principle of resistant welding and explain the seam welding process with neat sketch. Give its applications.
- Write short note on Electron Beam welding.
- Define the following terms
  1. Flux
  2. Filler materials.
- Describe the types of flame obtained in oxy-acetylene gas welding with neat sketch.
- Define the following terms
  1. Electrode
  2. Shielding gas
- Explain electron beam welding process and state its advantages and limitations.
- State the function of flux in soldering and brazing.
- Explain gas welding process with neat sketch and state its advantages and limitations.
- Differentiate between TIG and MIG welding processes.
- Calculate the melting efficiency in the case of arc welding and resistance welding of steel with potential of 20 V and a current of 200 A. The travel speed is 5 mm/s and the cross area of the joint is 20 mm². Heat required to melt steel may be taken as 10 J/mm³ and heat transfer efficiency as 0.85. Assume resistance, R=100 micro ohms
- What determines whether a certain welding process can be used for Workpiece in a horizontal, vertical, or an upside-down position, or for all types of positions? Explain, giving appropriate examples.
- Two flat copper sheets of 1.2mm thickness each are spot welded. The process parameters are: current = 5000A, Current flow time = 0.20second, and diameter of electrodes= 6mm. Estimate the heat generated in the welding zone.
- Explain the factors involved in electrode selection in arc welding processes.
- A steel tube of 76mm outer diameter and 4mm thickness is welded to a flat piece by applying friction welding process with the following information: Energy applied E=IS²/C, where I= Moment of inertia of the flywheel, S = spindle speed in rpm, C = proportionality constant = 250, weld zone = 5mm deep, and energy required to melt the electrode = 0.14kg-m. If the entire energy of the flywheel is used to heat the electrode, what is the required moment of inertia of the flywheel?
- Classify metal joining processes. Explain the principle of gas welding process with its advantages and limitations.
- Classify electrode used in arc welding and explain IS code used to specify it.
- Describe explosive welding process with its advantages and limitations
- Distinguish arc welding process and resistance welding process briefly. Explain the resistance welding cycles
- What is laser beam welding process? Explain the steps involved in the process and state
it’s application

• What are the common welding troubles, causes and remedies for them?
• Explain with neat sketch resistance spot welding process along with advantages and limitations.
• Why electrodes for A.C. welding are generally coated with potassium silicate binder and those for D.C. arc welding with sodium silicate?

ROLLING, FORGING AND EXTRUSION

• Explain how forging improves the mechanical properties of components.
• Distinguish clearly between drop-forging and press-forging processes with references to the process and products obtained.
• Explain with sketches the difference between direct and indirect extrusion.
• Distinguish clearly between drop-forging and press-forging processes with references to the process and products obtained.
• What are the advantages of hot working over cold working of metals?
• Explain the term ingot, slab, bloom and billet.
• Explain the extrusion blow-moulding process. Give its applications.
• List the various types of mould used in injection moulding. Explain any one with sketch giving its applications.
• Write short note on roll pass sequence.
• Derive the equation for the roll bite angle.
• Differentiate between open and close die forging.
• Write short note on Wire Drawing.
• Explain why there might be a change in density of a forged product as compared to that of the cast blank.
• Explain how you would go about applying front and back tensions to sheet metals during rolling.
• It was stated that the extrusion ratio, die geometry, extrusion speed, and billet temperature all affect the extrusion pressure. Explain why.
• How would you go about preventing center burst defects in extrusion? Explain why your methods would be effective.
• With the aid of sketches, compare the principles of compression moulding, injection moulding and extrusion moulding. Describe where each would be used in terms of materials and components.
• Explain with sketches the difference between direct and indirect extrusion.
• Explain the wire drawing and tube drawing with neat sketches.
• List the factors influencing rolling process. Explain the effect of roller diameter and metal friction on rolling process.
• Explain tube drawing and wire drawing process.
• In industry the rolls are cooled with a spray of water during hot rolling of steels. Why? State of least a products, which are manufactured by rolling process.
• What would be the consequence of having different speeds of the two rolls during rolling?
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- What is meant by balancing a die in a drop forging? Explain with example
- Distinguish between wire drawing and tube drawing with sketches.
- Give examples of typical products manufactured by the following forging processes and why? i) Machine forging ii) Smith forging iii) Drop forging.

SHEET METAL WORKING

- Explain coining and embossing processes
- What mechanical property is most important for its swaging? What type of stress is experienced by the material being swaged

PLASTIC TECHNOLOGY

- Explain thermoplastic and thermosetting plastic materials.
- Classify plastic materials.
- Define following terms with respect to polymers
  1. Viscosity
  2. Viscoelasticity
- Explain extrusion process for thermosetting plastic.
- Process of polymerization

SUPER FINISHING

- List the various super finishing processes and explain any two of them.
- The marking system for conventional grinding wheel is as under
  51 A 60 K 5 V 05
  Explain each term in marking system.
- Define following terms
  1. Honing
  2. Lapping
- Define following terms
  1. Burnishing
  2. Buffing
- Write short note on powder coating.
- Explain with sketch and application: Cylindrical and Center less grinding process for finishing operation.
- Explain: (i) Barrel Tumbling (ii) Polishing operation
- State the functions of superfinishing processes. Explain with sketch working of grinding and lapping process.
- Enlist types of super finishing processes. Discuss the selection criteria for appropriate super finishing process.