

**Ganpat University**  
**M.Tech. Sem. II (CAD/CAM) Mechanical Engineering**  
**CBCS (NEW) Regular Examination April - June 2015**  
**Sub.:3ME212 Advanced Casting & Welding Processes**

**Time: 3 Hours**

**Total Marks: 60**

- Instructions: i) Answer two sections separately.  
ii) Figures to the right indicate full marks.  
iii) Assume suitable data if necessary.

**Section I**

**Q.1**

- [a] Enlist characteristics of die casting. Also differentiate between hot chamber and cold chamber die casting process. **04**
- [b] The metal contracts in volume as it cool in the mould. Discuss the stages in which the contraction of the metal takes place. **02**
- [c] Explain causes and remedies of following defects occurred during continuous casting: **04**  
i) Cracks, ii) Depressions

**OR**

**Q.1**

- [a] Explain effect of grain refinement and modification of Al-Si alloy. **04**
- [b] Explain degassing of Al-Si alloy. **03**
- [c] What are the different properties of aluminum that make it suitable for its use in casting? **03**

**Q.2**

- [a] What are the different types of gates? What are the different objectives that a designed gating system must accomplish? **03**
- [b] Differentiate between white cast iron and malleable cast iron melting practice. **03**
- [c] Discuss all the formulas used to calculate the gating system dimensions. **04**

**OR**

**Q.2**

- [a] Explain importance of following variables of centrifugal casting process on mechanical properties of castings: **04**  
i) Pouring temperature, ii) Speed of mould rotation
- [b] Explain with neat sketch following patterns: **03**  
i) Gated pattern, ii) Match plate pattern, iii) Sweep pattern
- [c] Explain CO<sub>2</sub> moulding process along with advantages, limitations and applications. **03**

**Q.3**

- Write short notes on any two of the following: 10**
- [a] Riser Design
- [b] Solidification
- [c] Defects in Die casting
- [d] Cupola furnace



## Section - II

- Q.4
- [a] What are the requirements of an Electric arc welding power source? Describe in brief A.C. welding power source with the help of suitable sketches. 04
  - [b] What do you understand by Resistance welding? What is spot welding? How does it differ from projection welding? 04
  - [c] Differentiate between soldering and brazing. 02

OR

- Q.4
- [a] Explain the term "Transfer modes" and "Non transfer modes" used in Plasma arc welding process. Also enlist advantages of Plasma arc welding process. 04
  - [b] Describe theoretical or empirical or semi-empirical approach for temperature distribution in welding. Also draw temperature contour around the weld or arc during arc welding. 04
  - [c] What are coated electrodes? 02

- Q.5
- [a] Describe principle, working and applications of SAW. 03
  - [b] Distinguish with suitable sketches, Different types of Oxy-acetylene gas flames stating how they are obtained and their applications. 04
  - [c] Discuss residual stresses in weldments. 03

OR

- Q.5
- [a] Describe the importance design considerations for welded joints. 03
  - [b] What do you mean by weldability? Explain weldability of Aluminum and its alloys. 03
  - [c] Write short notes on Explosive welding. 04

- Q.6
- [a] What do you understand by HAZ? What is its importance? Which welding process has the minimum HAZ? 03
  - [b] Explain in brief the various defects and distortions in welding. 04
  - [c] Differentiate between TIG and MIG welding process. 03

End of Paper