

Ganpat University
M.Tech. Sem. II (CAD/CAM) Mechanical Engineering
CBCS Regular Examination May-2014
Sub.:3ME212 Advanced Casting & Welding Processes

Time: 3 Hours

Total Marks: 70

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

Section I

Q.1 **12**
[a] Explain CO₂ moulding process. Enlist advantages, limitations and applications of process.

- [b] Explain following process variables of centrifugal casting process:
i) Speed of mould rotation, ii) Pouring temperature
iii) Pouring speed, iv) Mould temperature

- [c] Explain following centrifugal casting defects:
i) Laps, ii) Hot tears, iii) Banding

OR

Q.1 **12**
[a] Enlist and explain characteristics of moulding sand.

- [b] What is continuous casting process? Explain process variables of continuous casting process.

- [c] Enlist and explain causes and remedies of continuous casting defects.

Q.2 **11**
[a] Differentiate between steel moulding and cast iron moulding.

- [b] Explain importance fluxing in Aluminum melting practice.

- [c] Explain effect grain refinement and modification of Aluminum alloys.

OR

Q.2 **11**
[a] Differentiate between white cast iron and malleable cast iron with respect to microstructure, properties and applications.

- [b] Explain melting practice of nodular cast iron along with properties of nodular cast iron.

- [c] Explain briefly procedural steps of Aluminum bronze melting practice.

Q.3 **12**
Write short notes on any three of following:

- [a] Gating system
[b] Principles of risering
[c] Investment casting- process variables
[d] Vacuum casting

Section - II

- Q.4 12
- [a] Explain following flames along with its applications:
i) Oxidizing flame, ii) Carburizing flame, iii) Neutral flame
- [b] Explain manual metal arc welding process with neat sketch.
- [c] Differentiate between straight polarity and reverse polarity.
- OR
- Q.4 12
- [a] What is submerged arc welding? Explain role of flux in SAW. Also discuss common defects occurred in SAW.
- [b] Differentiate between TIG and MIG welding process.
- [c] Explain the principle of resistance welding. Enlist advantages of resistance welding processes over the other welding processes.
- Q.5 11
- [a] Describe the function and characteristics of electrode. Enlist functions of electrode covering.
- [b] Enlist and explain process variables of friction stir welding.
- [c] Write short note on: Automation in welding
- OR
- Q.5 11
- [a] Explain the process of plasma arc welding.
- [b] What are the basic joint design differences between design used with filler metal and that used without filler material?
- [c] Enlist and explain various welding defects with neat sketch.
- Q.6 12
- Write short notes on the following:(Any Three)
- [a] Heat affected zone
- [b] Under water welding
- [c] Explosive welding
- [d] Welding metallurgy of high alloyed steel.

End of Paper