

Ganpat University
M.Tech.Sem II (CAD/CAM) Mechanical Engineering
Regular Examination - July 2013
Sub.: 3ME 212 Advanced Casting & Welding Processes

Time: 3 Hours

Total Marks: 70

- Instructions:** 1) Answer two sections separately.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

Section I

Q-1

11

- (a) Differentiate between horizontal and vertical centrifugal casting process.
(b) Explain importance of following variables of centrifugal casting process on mechanical properties of the castings produced:
i) Speed of mold rotation
ii) Mould coat thickness
iii) Mould temperature
iv) Pouring temperature of liquid metal
(c) What is centrifuge casting process? Enlist applications of the process.

OR

Q-1

11

- (a) What are the main ingredients of moulding sands? Explain properties and importance of different ingredients of moulding sand.
(b) What is phenolic resin bonded sand? Explain the process of no-back resin sand moulding along with advantages, limitations and applications.
(c) Differentiate between shell moulding and phenolic no-bak moulding process.

Q-2

12

- (a) What is riser? Differentiate between open riser and blind riser.
(b) Explain riser and directional solidification with respect to additional aids.
(c) What is gating ratio? Differentiate between pressurized and unpressurized gating system.

OR

Q-2

12

- (a) Explain hydrogen degassing in aluminium melting practice.
(b) What is grain refinement? Explain importance of grain refinement in Al-Si alloys.
(c) Explain effect of modification in Al-Si alloys.

Q-3

12

- Write short notes on Any three of the following:
(i) Malleable cast iron
(ii) Continuous casting
(iii) Shell moulding.
(iv) Design principles of gating systems
(vi) Mechanization of foundry processes

Section II

Q-4

- (a) What is gas welding process? Explain following flames: 4
i) Oxidizing flame
ii) Carburizing flame
iii) Neutral flame
- (b) Differentiate between gas welding and arc welding process. 4
- (c) Explain briefly soldering and brazing process. 4

OR

Q-4

- (a) Explain principle of submerged arc welding process and explain the process in brief. List applications of submerged arc welding process. 5
- (b) Explain manual metal arc welding process in detail along with its advantages and limitations of the process. 4
- (c) Write short notes on Heat affected zone. 3

Q-5

- (a) What is tungsten inert gas welding process? Explain process variables of TIG welding process. 3
- (b) Explain the metal inert gas welding process in brief. 4
- (c) Write short notes on inert gases and use of fluxes in welding. 4

OR

Q-5

- (a) Explain the process of plasma arc welding. 3
- (b) What is friction stir welding process? Enlist recent applications of the process. 4
- (c) Explain the process of spot welding along with process equipment specification. 4

Q-6

Answer the following: (Any Three) 12

- (a) Effect of residual stresses on weld joints
- (b) Types of weld joints
- (c) Laser welding
- (d) Automation in welding
- (e) Welding electrodes

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