Ganpat University
M.Tech.Sem II (AMT) Mechanical Engineering
Regular Examination - July 2013
Sub.: 3ME202 Advanced Metal Casting & Welding Technology

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

(a) Differentiate between green sand moulding and CO_2 moulding process. 4

(b) Explain procedural steps of investment casting process. Discuss process parameters affecting quality of castings. 4

(c) Write short notes on plant equipment and mechanization. 3

OR

Q-1

(a) Discuss solidification in sand mould and permanent mold. Also discuss micro and macro segregation. 4

(b) Differentiate between steel melting and cast iron melting. 3

(c) Differentiate between gray cast iron and white cast iron with respect to its microstructure, properties and applications. 4

Q-2

(a) Explain basic principles of gating and risering systems. 4

(b) What are the functions of gates? Differentiate between top, bottom and parting line gates with respect to advantages, limitations and applications. 4

(c) What is gating ratio? Differentiate between pressurized and unpressurized gating system. Also differentiate between single and multiple gating system. 4

OR

Q-2

(a) Discuss grain refinement and modification of Al-Si alloys. 4

(b) Explain hydrogen porosity in Al-Si alloys. 4

(c) Write short notes on measurement of fluidity. 4

Q-3 Write short notes on Any three of the following: 12

(i) Casting defects
(ii) Continuous casting
(iii) Die casting
(iv) Types of pattern and pattern allowances
(vi) Core making

Section II

Q-4

(a) Explain the resistance welding process along with equipment, process parameters and application of the process. 4

(b) Explain the criteria for selection of electrodes for a particular process of arc welding process. 4

(c) Enlist the advantages of using inert gases in place of fluxes in the process of welding. 4

OR

Q-4

(a) What is submerged arc welding process? Enlist process parameters used in SAW process. Discuss limitations of the process. 5

(b) Differentiate between TIG and MIG welding process. 4

(c) Write short notes on Gas Cutting. 3

Q-5

(a) What is Tungsten Inert gas welding? Discuss equipment and process parameter of TIG welding process along with its specific applications. 3

(b) Discuss possible metallurgical changes taking place during welding of carbon and low alloy steel. 4

(c) Explain the process of friction stir welding along with process parameters used. 4

OR

Q-5

(a) Explain the process of welding of dissimilar metals. 3

(b) Explain the process of underwater welding. Discuss defects and precaution in under water welding process. 4

(c) Explain briefly causes and remedies of welding defects. 4

Q-6 **Answer the following: (Any Three)** 12

(a) Plasma arc welding-process parameters & fields of application

(b) Weld distortion

(c) Friction welding

(d) NDT in weldings

(e) Automation in welding

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