Seat No.: ____

Enrolment No.___

GUJARAT TECHNOLOGICAL UNIVERSITY BE – SEMESTER V • EXAMINATION – WINTER - 2012

Subject code: 152501

Date: 11-01-2013

Subject Name: Casting Technology

Time: 02:30 pm to 05:00 pm

Total Marks: 70

- Instructions:
 - 1. Attempt all questions.
 - 2. Make suitable assumptions wherever necessary.
 - 3. Figures to the right indicate full marks.
- Q.1 (a) Explain the technical and economic characteristics in the selection of casting process. Write 07 specific advantages offered by casting process.
 - (b) What is pattern? What is difference between a pattern and a casting? 07 Enumerate the various functions of a pattern.
- Q.2 (a) Describe the following patterns with their neat sketch and indicate the production 07 circumstances in which each would be used. (i) Match plate pattern (ii) Split patterns (iii) Sweep patterns (iv) Skeleton pattern (v) Follow board pattern.
 - (b) What is the purpose of various pattern allowances? Explain shrinkage allowance, draft 07 allowance, finishing allowance, camber allowance and indicate their value for some of the common metals.

OR

- (b) List five important properties desired as a pattern material. Describe at least three important 07 materials used for pattern making and compare them.
- Q.3 (a) Explain the formation of casting from liquid metal poured in a mould. Discuss the 07 conditions which favour the formation of fine equi-axial grains.
 - (b) List the functions of cores. Explain with sketches the different types of core boxes and types 07 of cores made from them.

OR

- Q.3 (a) Draw a neat sketch of cupola furnace showing its different parts and zones. Explain the 07 importance of (i) bed-coke and (ii) metal to coke ratio in the performance of cupola.
 - (b) What are the operations in melting and refining steel in direct arc furnace? Describe the 07 reactions involved in dephospherisation and desulphurisation.
- Q.4 (a) Describe with neat sketch the various components of good running/gating system. Discuss 07 the functions to be performed by each.
 - (b) Differentiate between progressive and directional solidifications and show how directional 07 solidification can be achieved by controlling progressive solidification during design stage and moulding stage of a casting.

OR

- **Q.4** (a) Differentiate between (i) annealing, (ii) normalizing and (iii) tempering of castings.
 - (b) With neat sketch, describe the Investment casting process, its merits-demerits and 07 applications of the process
- Q.5 (a) With a neat sketch, give the principle of operation and application of pressure die casting 07 and gravity die casting process.
 - (b) Give the classification of casting defects. Explain the causes and remedies of surface defects 07 and dimensional defects.

OR

- Q.5 (a) Explain the need for mechanization and modernization of foundry. Giving neat sketches 07 explain briefly two methods of dust collecting equipment used in foundry.
 - (b) List the typical tasks which can be done by computers in foundry application and explain 07 briefly typical software used with its advantages.

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