*Seat No.: _____* *Enrolment No._____*

# GUJARAT TECHNOLOGICAL UNIVERSITY

**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014**

**Subject code: 2712801** **Date: 07-01-2015**

**Subject Name: Advance Casting Technology**

**Time: 02:30 pm - 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain an activity in Foundry through a flow chart and compare the merits and demerits of Foundry process with other manufacturing process. | **07** |
| | **(b)** | Discuss the different ingredients of moulding sand. Also compare these Ingredients with the ingredients of core sands. | **07** |
| **Q.2** | **(a)** | Explain Evaporative Pattern Casting with neat sketch. | **07** |
| | **(b)** | Explain core location in casting with different core materials and their Characteristics. | **07** |
| | | **OR** | |
| | **(b)** | Explain Continuous Casting Process with merits and demerits. | **07** |
| **Q.3** | **(a)** | Explain how nucleation occurs and grows in the freezing of the pure metal. Discuss the difference between homogeneous and heterogeneous nucleation. | **07** |
| | **(b)** | Elaborate solidification analysis and state the equation for unsteady state heat transfer involved in solidification of metal in a mould. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | State the basic requirements for effective function of a riser. State and explain any three commonly used methods for calculating riser size. | **07** |
| | **(b)** | Sketch the components of gating system. What are the functions of good gating system? Explain the casting defects attributable to poor gating design? | **07** |
| **Q.4** | **(a)** | State the assumptions made for deriving an equation for solidification time of a simple shaped casting and thereby derive Chovorinovôs equation. State the applications of the equation. | **07** |
| | **(b)** | Explain the principle, application and limitations of (i) Dye penetrant testing (ii) Magnetic particle testing. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Discuss the factors that affect the fluidity of metals also how its measurements taken. | **07** |
| | **(b)** | State general guidelines for process-friendly casting design. | **07** |
| **Q.5** | **(a)** | State and describe the casting defects and their remedies. | **07** |
| | **(b)** | Explain Fettling, Inspection and Testing of Metal Casting Process. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain Design for Castability. | **07** |
| | **(b)** | Write a short note on collaborative engineering. | **07** |

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