

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016**

**Subject Code:2172112****Date:21/11/2016****Subject Name:Physical Metallurgy of Special Purpose Non-ferrous Metals and Alloys (Department Elective - I)****Time:10.30 AM to 1.00 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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|------------|------------|--|-----------|
| <b>Q.1</b> | <b>(a)</b> | Discuss selection of Titanium-alloys for service.                                  | <b>07</b> |
|            | <b>(b)</b> | Describe advantage & limitations of non-ferrous metals & alloys.                   | <b>07</b> |
| <b>Q.2</b> | <b>(a)</b> | Discuss heat treatment of alpha-beta alloys in titanium.                           | <b>07</b> |
|            | <b>(b)</b> | What is the effect of Nickel on thermal expansion of Iron? Explain Invar material. | <b>07</b> |
| <b>OR</b>  |            |  |           |
|            | <b>(b)</b> | Sketch phase diagram for brass and discuss its properties and applications.        | <b>07</b> |
| <b>Q.3</b> | <b>(a)</b> | Write note on Antifriction Alloys (Babbitt Alloys).                                | <b>07</b> |
|            | <b>(b)</b> | Discuss effect of alloying elements in Ti alloys.                                  | <b>07</b> |
| <b>OR</b>  |            |  |           |
| <b>Q.3</b> | <b>(a)</b> | Describe properties and applications magnesium alloys.                             | <b>07</b> |
|            | <b>(b)</b> | Discuss its properties and applications of lead alloys.                            | <b>07</b> |
| <b>Q.4</b> | <b>(a)</b> | Write note on heat treatment of Al alloys and its effect on properties.            | <b>07</b> |
|            | <b>(b)</b> | Discuss detailed classification of Al-alloys.                                      | <b>07</b> |
| <b>OR</b>  |            |  |           |
| <b>Q.4</b> | <b>(a)</b> | Discuss properties and applications of tin alloys.                                 | <b>07</b> |
|            | <b>(b)</b> | Explain Solution heat treatment process for Aluminum Alloys.                       | <b>07</b> |
| <b>Q.5</b> | <b>(a)</b> | Using Cu-Sn phase diagram explain effect of Sn on properties of Bronze.            | <b>07</b> |
|            | <b>(b)</b> | Discuss composition, properties and applications of Nichrome and Hastelloy.        | <b>07</b> |
| <b>OR</b>  |            |  |           |
| <b>Q.5</b> | <b>(a)</b> | Discuss silver – copper alloys using phase diagram.                                | <b>07</b> |
|            | <b>(b)</b> | Write brief note on aluminum bronze and phosphorus bronze.                         | <b>07</b> |

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