

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 172101

Date: 09/05/2017

Subject Name: Physical Metallurgy - II

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) Describe mechanism of formation of Austenite on heating. **07**  
(b) Draw and explain Time Temperature Transformation Diagram. **07**
- Q.2** (a) Discuss briefly Hull – Mehl model of pearlitic transformation **07**  
(b) What is hardenability? Discuss Jominy hardenability test. **07**
- OR**
- (b) How Austenitic grain size is measured? Explain any one technique **07**
- Q.3** (a) Explain bain distortion model for martensitic transformation. **07**  
(b) Describe the mechanism of formation of upper and lower bainite. **07**
- OR**
- Q.3** (a) What is heat treatment? List out all heat treatment processes. Explain Normalising. **07**  
(b) List out all annealing processes. Explain spherodising annealing. **07**
- Q.4** (a) Short note on Austempering. **07**  
(b) What is nitriding? Explain plasma nitriding in brief. **07**
- OR**
- Q.4** (a) Explain heat treatment of EN-8 Steel. **07**  
(b) Short note on thermo mechanical treatment. **07**
- Q.5** (a) Which are different surface hardening heat treatments of steel? Explain about pack carburizing. **07**  
(b) Explain heat treatment of HSS tool steel. **07**
- OR**
- Q.5** (a) List out defects in heat treated part and discuss any one with causes and remedies. **07**  
(b) Explain the effect of alloying element on pearlitic transformation. **07**

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