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## GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII • EXAMINATION - WINTER 2013

Subject Code: 172101 Date: 26-11-2013 **Subject Name: Physical Metallurgy - II** Time: 10:30 TO 01:00 **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. 0.1 Discuss briefly Hull – Mehl model of pearlitic transformation. 07 Describe the mechanism of formation of upper and lower bainite **(b)** 07 07 0.2 Differentiate between upper and lower bainite (a) How carbon content, presence of carbide forming elements, prior heat 07 **(b)** treatment and interlamellar spacing effect on the kinetics of formation of austenite on heating. OR Explain heattreatment of EN-8 Steel. 0.3 How Austenitic grain size is measured? Explain any one technique. 07 Draw the crystal structure of Martensite? Discuss Bain Distortion Model. 07 0.3 What are different heat treatment processes for steel? 07 Expain recrystallization annealing. Short note on thermo mechanical treatment **07 Q.4** Differntiate between Aus tempering treatment and Mar tempering 07 treatment. (b) Explain heat treatment of HSS tool steel. 07 **Q.4** Explain why hardening by quenching is followed by tempering 07 (a) treatment? How do mechanical properties vary with temperature? (b) What is Hardenability? What are different methods carried out to check 07 this? Explain about Jominy end quench test. 0.5 Which are different surface hardening heat treatments of steel? 07 Explain about pack carburizing. **b)** What is Quenching? Whar are the characteristics of Quenchant? 07 OR **Q.5** Short note on Retained Austenite. 07 (a) Short note on thermo mechanical treatment. 07

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