

GUJARAT TECHNOLOGICAL UNIVERSITY**B.E. Sem-III Examination December 2009****Subject code: 132101****Subject Name: Material Science & Met.****Date: 19 / 12 / 2009****Time: 11.00 am – 1.30 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) Sketch and label blast furnace for production of pig iron. Explain its various zones. **07**
- (b) What is casting? Explain various steps, advantages and application of foundry. **07**
- Q.2** (a) Describe different metal forming process. Write about rolling and various rolling mills. **07**
- (b) i) Name various NDT techniques and explain in detail any one of it. **05**
- ii) Differentiate between Ductility and Malleability. **02**
- OR**
- (b) i) Give classification of Engineering materials with important characteristics and engineering use. **05**
- ii) Differentiate between Elasticity and Plasticity. **02**
- Q.3** (a) i) Metallurgical industries in India. **04**
- ii) What is MMC, PMC, CMC and give example of each composite material. **03**
- (b) i) What do you mean by metal joining? Write in detail about fusion welding **05**
- ii) Define hardness, specific heat. **02**
- OR**
- Q.3** (a) What is polymer? what is polymerization? List different polymerization mechanism. Explain one mechanism in detail. **07**
- (b) i) Differentiate between n-type and p-type semi conductors. **03**
- ii) Short note on protective coatings. **04**
- Q.4** (a) i) What is cement? Give flow diagram of dry process cement. **04**
- ii) Differentiate between Thermoplastic and Thermosetting. **03**
- (b) i) Production of copper. **05**
- ii) Define stress, toughness. **02**
- OR**
- Q.4** (a) i) List different types of imperfection in crystal structure. Differentiate between edge dislocation and screw dislocation. **05**
- ii) Define soldering and brazing. **02**
- (b) i) List out properties of ceramic materials. **04**
- ii) Draw tube making by extrusion process. **03**
- Q.5** (a) What is powder metallurgy? Write different steps, advantages, limitations of powder metallurgy. **07**
- (b) What is corrosion? List out types of corrosion and explain any one method of corrosion prevention. **07**
- OR**
- Q.5** (a) Rockwell and Brinell hardness test. **07**
- (b) i) Short note on Refractories. **04**
- ii) Short note on effect of alloying element on properties of material. **03**
