

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma Semester -III (Fabrication Technology) Examination January- 2010

Subject code: 335502

Subject Name: MATERIALS & METALLURGY

Date: 23 / 01 / 2010

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.
4. English version is Authentic

- Q.1** **14**
- (a) Define “ Material Science “ & “ Metallurgy “. Explain importance of the study of materials science & metallurgy.
- (b) List different properties of materials. Explain mechanical properties of engineering materials
- Q.2** **07**
- (a) Explain stress – strain curve with neat sketch. Explain following terms with respect to stress – strain curve
- a. Yield strength
 - b. Ultimate strength
 - c. % elongation
 - d. % reduction in area
 - e. breaking strength
- (b) Classify the ferrous metal and explain chemical composition, characteristics and application of Gray Cast Iron **07**
- OR**
- Q.3** **07**
- (b) Define “ Steel”. Classify & Explain different types of steel
- Q.3** **07**
- (a) Explain effect of different alloying elements on properties of steel
- (b) Explain important properties & application of Titanium **07**
- OR**
- Q.3** **07**
- (a) Explain material test certificate with suitable example **07**
- (b) Explain SC, BCC, FCC & HCP crystal structure with neat sketch **07**
- Q.4** **07**
- (a) Draw Iron Carbon diagram and show different micro-constituents observed on it **07**
- (b) Define following terms **07**
- a. Crystallography
 - b. Crystal
 - c. Structure
 - d. Space Lattice
 - e. Unit Cell
 - f. Solid solution
 - g. Phase diagram

OR

- Q. 4** (a) Explain metallurgical microscope with neat sketch **07**
(b) Explain properties & application of plastics. Compare thermo set & thermo plast plastics **07**

Q.5

- (a) Define “ Heat Treatment Process “. Classify Heat treatment process & Explain purpose of heat treatment **07**
(b) What is composite material ? List different types of composite materials & Explain any one. **07**

OR

- Q.5** (a) Explain following terms briefly **07**
a. Fatigue
b. Fatigue Limit
c. Creep
d. Fracture
e. Fatigue
f. Age hardening
g. Strain aging
- (b) Write chemical composition, mechanical properties & application of following metals **07**
a. BIS 2002
b. SA 515 GR 60
c. SA 105
d. SA 240 TP 304
e. SA 240 TP 316 L
f. SA 240 TP 321,
g. EN 8
