



RN-8121

**B. E. - II (Sem. III) (Mechanical) Examination**  
**May / June - 2010**  
**Material Science & Metallurgy**

Time : 3 Hours]

[Total Marks : 100

**Instructions :**

(1)

नीचे दृश्यावेक निशानीवाणी विगतो उत्तरवडी पर अवश्य लभवी.  
Fillup strictly the details of signs on your answer book.

Name of the Examination :  
**B. E. - 2 (Sem. 3) (Mechanical)**

Name of the Subject :  
**Material Science & Metallurgy**

Subject Code No. : **8 1 2 1** Section No. (1, 2,.....): **1&2**

Seat No. :

Student's Signature

- (2) Attempt **all** questions.  
(3) Figures to the right indicate full marks.  
(4) Draw neat sketch wherever necessary.  
(5) Answer to the **two** sections should be written in **two separate** answer books.

**SECTION - I**

- 1 Attempt any **four** from following : 20
- (a) Define the following terms :
- (i) Elasticity
  - (ii) Tensile strength
  - (iii) Fatigue
  - (iv) Hardness
  - (v) Impact strength.
- (b) Define point defect. Explain any one.
- (c) Explain B.C.C. structure and calculate no. of atom per unit cell, atomic radius, atomic packing factor for it.
- (d) Explain Lever phase Rule.
- (e) Explain specimen preparation for microscopic examination.

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[Contd...

- 2** Answer the following :
- (i) Explain plain carbon steel in detail with its classification. **8**
  - (ii) Draw T-T-T diagram for 0.8% carbon steel and explain its importance to the heat treatment processes given to the steel. **7**

**OR**

- (ii) Explain Peritectic Reaction with neat sketch. **7**
- 3** Answer any **three** from following : **15**
- (i) Explain spark test
  - (ii) Explain Eggertz method for carbon estimation in steel.
  - (iii) Explain Normalising process
  - (iv) Give criteria for selection of materials for engineering applications.

**SECTION - II**

- 4** (a) Answer any **six** : **12**
- (i) What is Martensite?
  - (ii) What is composite materials?
  - (iii) What is diffusion?
  - (iv) What is curie point?
  - (v) What is corrosion?
  - (vi) List of refractory materials.
  - (vii) Difference between hardness and hardenability.
  - (viii) Write down the composition (chemical elements) of gun metal.
- (b) Answer the following : **12**
- (i) Explain joining end quech test and Hardenability bands.
  - (ii) Limitations of power metallurgy.

5 (i) Explain wet corrosion. 7

OR

(i) Short note : Hybrid composites. 7

(ii) Draw and label Fe-Fe<sub>3</sub>C diagram and explain various phases present in. 8

6 (i) Write down the concept, advantages, disadvantages and application of hot pressing in powder metallurgy. 6

OR

(i) Explain different methods of producing metal powder. 6

(ii) Short note : Dye penetrant test. 5

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