



RM-6425

**B. E. - II (Sem. IV) (Chemical) Examination**  
**May / June - 2010**  
**Chemical Engineering Materials**

Time : 3 Hours]

[Total Marks :

**Instructions :**

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<b>B. E. - 2 (Sem. 4) (Chemical)</b>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<b>Chemical Engineering Materials</b>	<input type="text"/>
Subject Code No. : <input type="text"/> 6 <input type="text"/> 4 <input type="text"/> 2 <input type="text"/> 5	Section No. (1, 2,.....): <input type="text"/> 1&2
Student's Signature	

- (2) Answer each section **separately**.  
(3) Figures to the right indicate full marks.  
(4) Draw neat and labelled diagrams wherever required.

**SECTION - I**

- 1 (a) Answer the following : **2×5=10**
- (i) If  $r$  is the radius of atom, what is the side of Face-centered cubic structure (FCC)?
- (ii) What is negative edge dislocation?
- (iii) Explain twin boundaries.
- (iv) What is creep?
- (v) Explain BCC structure.
- (b) What is polymorphism? Explain in detail with an example. **8**
- 2 Answer the following :
- (a) (i) What is material science? **2**
- (ii) Explain Frank read mechanism for formation of dislocation ring. **6**

- (b) Explain Gibbs' phase rule. 4
- (c) Explain Lever rule. 4
- 3 (a) Answer any **two** : 4×2=8
- (i) Explain Power Method  
(Debye Sherer Method)
- (ii) Differentiate Edge Dislocation and Screw Dislocation.
- (iii) Explain Hook's law and modulus of material.
- (b) (i) X ray with a wavelength of  $0.58 \text{ \AA}$  are used for calculating  $d_{(200)}$  in nickel. The reflection angle is  $9.5^\circ$ . What is the size of the unit cell? 6
- (ii) Explain nucleation and crystal growth. 2

OR

Explain Grains and Grain Boundary.

## SECTION - II

- 4 Answer the following : 16
- (a) Explain following : 6
- (i) Corrosion inhibitors
- (ii) Galvanic corrosion
- (b) State properties, applications and composition of 4
- (i) Ceramics
- (ii) Ni alloys
- (c) Cathodic protection: Short note. 6
- 5 Answer the following : (any **four**) 16
- (a) Copper and its alloy
- (b) Microbiological Corrosion
- (c) Give difference between thermoplastics and thermosetting plastics
- (d) Discuss different types of ceramic and organic materials
- (e) Explain properties of refractories.

**6** Attempt any **three** :

**18**

- (a) Classification of polymers. Importance of polymers in chemical process industry. Explain in brief.
  - (b) What information is supplied by TTT curves? Explain ductility, toughness and resilience in brief.
  - (c) Explain precipitation hardening in detail.
  - (d) Classify materials, give chemical and physical properties of Engineering materials.
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