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RN-8121

B. E. - II (Sem. III) (Mechanical) Examination

May / June – 2010

Material Science & Metallurgy

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
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.

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_3C 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**