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BT-302

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Roll No. A2305212173

**B. TECH, B. TECH + MBA DUAL DEGREE  
PROGRAMMES (CSE, IT, ECE, MAE, CE,  
E & EE, E & I, NS & T), B. TECH (MAE) +  
M. TECH (A) - DD, B. TECH +  
M. TECH (NS & T) - DD &  
B. TECH (CSE, ECE, MAE) - EVENING**

**THIRD SEMESTER END TERM EXAMINATION :  
NOVEMBER, 2013**

**MATERIAL SCIENCE**

*Time : 3 Hrs.*

*Maximum Marks : 70*

*Note: Attempt questions from all sections as directed.*

**SECTION - A (30 Marks)**

*Attempt any 5 questions.*

*Each question carries 6 marks.*

1. Explain the various types of engineering materials.
2. Differentiate between the monomer and polymer. Explain the process of polymerization. Find the degree of polymerization in styrene? Given its molecular weight is  $1.04 \times 10^6$ .

P.T.O.

3. State the effects of adding following alloying elements to steel : Molybdenum, Titanium & aluminium.
4. Write a short note on LCD (Liquid Crystal display). 10.
5. Explain the Isothermal Transformation diagram in steel.
6. Name and explain the composition of any five alloys along with their application.

**SECTION – B (20 Marks)**

*Attempt any two questions.*

*Each question carries 10 marks.*

7. Calculate the interplanar spacing for (110), (111), (120), (123), (221) plane of the iron. Which of the plane has greatest interplaner spacing ? Atomic radius of iron is  $0.134\text{\AA}$ .iron.
8. Name the various non-destructive testing methods and explain any two of them.
9. (a) Enumerate and sketch the basic seven crystal lattices of Bravias crystal lattice system.  
(b) Draw iron-carbon equilibrium diagram and show all the salient features on it.



SECTION - C (20 Marks)  
(Compulsory)

10. (a) Define the term hardenability. What factors affect hardenability? Describe the method for determining the hardenability of steel. (5)
- (b) What are the different types of ceramics? Name any five ceramics and write their properties and applications. (10)
- (c) There is probability for an electron to occupy an energy state which is  $0.4\text{eV}$  above the Fermi energy. Estimate the temperature at which this can happen. (5)