CODE NO: R05220804

2008 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

II B.TECH II SEMESTER SUPPLIMENTARY EXAMINATIONS
MATERIAL SCIENCE FOR CHEMICAL ENGINEERS
(CHEMICAL ENGINEERING)

AUG/SEP 2008

TIME:3 HOUR
MARK:80

ANSWER ANY FIVE QUESTIONS.ALL QUESTIONS CARRY EQUAL MARKS

1. How Engineering materials are classified on the basis of chemical nature and atomic structure. Give characteristic properties, application and examples under each category.

2. (a) What is solid solution.

(b) Discuss the similarities and differences between substantial and solid solution.

3. Distinguish among the direction of the dislocation line, the Burgers vector and direction of dislocation motion for:

(a) an edge and

(b) a screw dislocation.

4. (a) Dendritic growths cannot be identified by an etching technique in pure materials. Why?

(b) Explain briefly various applications of phase diagrams.

5. (a) Describe the time-temperature-transformation characteristics of the eutectoid steel with a suitable diagram.

(b) Discuss about the effect of alloying elements on the properties of steel.

6. (a) What is viscoelastic behavior? In which material is it commonly found?

(b) Explain the macroscopic models of Maxwell and Voigt-Kelvin used to describe viscoelastic behavior of materials.

7. What are composite materials? What are the different types of composite materials? Describe each one of them.

8. Explain the following:

(a) Intergranular corrosion

(b) Stress corrosion

(c) Dezincification

(d) Crevice corrosion.