Printed Pages : 2

EME-301

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 140301

Roll No.

B. Tech.

(SEM. III) (ODD SEM.) THEORY EXAMINATION, 2014-15

MATERIAL SCIENCE IN ENGINEERING

Time : 3 Hours] [Total Marks : 100

1 Attempt any **FOUR** parts : **(5x4=20)**

a) What are some of the typical characteristics of ceramic materials ?

b) Name some applications where ceramics are used.

c) What are the special properties of plastics that make them useful engineering materials ?

d) What are the factors which determine the mechanical behavior of plastics ?

e) Write short notes on Smart material with its application

f) Briefly explain mechanism of fatigue and corrosion with neat sketches.

2 Attempt any **TWO** parts : **(10x2=20)**

a) What do you mean by Miller Indices ? Explain the procedure for finding Miller Indices.

b) NACL structure has FCC Structure. The density of NACL is 2.18 cm^3. Calculate the distance between two adjacent atoms.

c) Enumerate the various atomic models proposed by scientist over the last few decades.

3 Attempt any **TWO** parts : **(10x2=20)**

a) What is a fatigue failure ? How is a fatigue test carried out ?

b) What is specimen preparation ? Explain the steps involved in specimen preparation.

c) Draw the Iron-carbon equilibrium diagram and explain the features.

4 Attempt any **TWO** parts : **(10x2=20)**

a) State and explain Fick's First and Second Law.

b) What is TTT Diagram? Explain briefly with neat sketch stating its importance.

c) I. State the comparison of Cast iron, Wrought iron and Mild steel.

II. Classify Brass and explain any two type stating its composition.

5 Attempt any **TWO** parts : **(10x2=20)**

a) Explain the following :

I. Ferromagnetism

II. Diamagnetism.

b) Distinguish between intrinsic and extrinsic semiconductor. Discuss why intrinsic semiconductor is not used in semiconductor devices.

c) Define superconductivity. Explain Type II superconductor is detail and application of Type II superconductor in detail.
