SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL NO : | | | | | | | | | | | | **Total number of pages:[ ]**

Total number of questions: 09

B.Tech. CHEMICAL ENGG./ 6th Sem
Subject ENGINEERING MATERIALS
Code BTCH-604
Paper ID :

Batch:2004 onwards/2011onwards/2015 onwards[Tick Relevant]

Time allowed: 3 Hrs **Max Marks:60**

Important Instructions:

- **Section A is compulsory**
- **Attempt any four questions from section B**
- **Attempt any two questions from section C**
- **Assume any missing data**
- **Additional instructions, if any**

PART A (2×10)

Q.1. Answer in brief:

(a) What are ceramics? Why do they possess high hardness and high melting point?

(b) Define glass transition temperature. How can it be measured?

(c) Classify the different types of glasses? Which type of glass is most suitable as chemical laboratory equipment?

(d) What are Miller indices? Write the steps to calculate the Miller indices of a plane, cutting the three axes, a,b and c at 2,3 and 4A^{o} respectively?

(e) What type of materials can be used for cooking utensils? Arrange them in order your preference?

(f) Compare the properties of zinc and magnesium.

(g) Differentiate between Gray Cast Iron and White Cast Iron.

(h) Calculate that Atomic packing factors for FCC & BCC structures.

(i) Name the materials used in the following cases. Give reasons in each case. (i) Fuses. (ii) Solder. (iii) Bimetals

(j) What are biomaterials? Give its applications?

PART B (5×4)

Q.2 Draw and explain the phase diagram of Cu-Ni alloy system. What useful information is given by this diagram?

Q. 3 Why is the use of Aluminium increasing at a faster rate in India? Give three important applications of Aluminium and its alloys?

Q.4 What is clay? Differentiate between stonewares,earthwares and porclein . Which material among these three is selected for fine crockery?

Q.5 What are the various grades of copper available for electrical conductors?Under what circumstances are they used?

Q.6 What is Burger's vector? Explain the various methods to improve the strength of metals.

PART C (10×2)

Q. 7 a. How is steel classified? Draw a flowchart. Explain the properties and uses of wrought iron.

b. What is meant by the term refractory? Describe its properties. Explain the differences between acid, basic and neutral refractories.?

Q. 8 a. What are silica bricks? How are these made? How are they different from dolomite bricks?

b.Define and discuss I brief the following properties with reference to engineering materials (i) Electrical diffusivity and (ii) Thermal Conductivity

Q. 9 What is a Polymer?How does it differ from metals and ceramics? Give the structure, properties and applications of Polycarbonates and Nylon 6, 6.