

Roll No.

23397

**M. Tech. 1st Semester (Civil Engg.)
(Specialisation in Structural Design)
Examination – January, 2023**

MATERIAL SCIENCE

Paper : MTSD-110

Time : Three Hours I

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting one question from each Section. Question No. 1 is compulsory.
All question carrying equal marks.

- 1.** Explain the following : 5 × 4 = 20
- (a) Atomic Bonding.
 - (b) Surface Treatment.
 - (c) Silicate glass.

23397 2021(P-3)(Q-9)(23)

P. T. O.

- (d) Corrosion and Oxidation.
(e) Fracture and Fatigue.

SECTION – A

2. (a) Explain structure of solid material. Also explain their generalized properties. 10
(b) Discuss the classification of crystal imperfections in details. 10
3. Classify material in details. What are the important properties of material ? Explain diffusion mechanism of solid and its application in details. 20

SECTION – B

4. (a) Write about the importance and objectives of phase diagram. 10
(b) Explain the iron carbon diagram in details. What is its application ? 10
5. Explain the principles, classification and purpose of surface treatment in details. 20

23397- (P-3)/(Q-9)/(23) (2)

- SECTION – C**
6. Define Ceramic materials. Explain the general structure and properties of ceramics. 20
7. What are composite materials ? Explain the component and types of composite materials. 20

SECTION – D

8. What is high strength concretes ? Explain structure property relationship in concrete. 20
9. Explain in details the mechanism of fracture and fatigue. Also write the impact of temperature on fatigue. 20

23397- (P-3)/(Q-9)/(23) (3)