

T.Y.B.SC. SEM – V (2014 Course) : WINTER - 2018
SUBJECT : ELECTIVE – I : a) ELEMENTS OF MATERIALS SCIENCE

Day : Saturday
Date : 20/10/2018

W-2018-0850

Time : 12.00 NOON TO 02.00 PM
Max. Marks : 40

N. B. :

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat and labelled diagrams **WHEREVER** necessary.
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Q.1 Attempt any **TWO** of the following. **(10)**

- (a) What is Thermal stress? Obtain the relation of thermal stress in terms of Young's modulus.
- (b) Explain the zinc blende or zinc sulphide (ZnS) structure with diagram.
- (c) Explain the mechanical properties – ductility and malleability.

Q.2 Attempt any **TWO** of the following. **(10)**

- (a) Explain the Eutectic Type Lead-Tin (Pb-Sn) phase diagram.
- (b) Explain the shearing stress and shearing strain with diagram.
- (c) Describe the ethylene polymerization with diagram.

Q.3 Attempt any **TWO** of the following. **(10)**

- (a) Explain the phase diagram of NaCl-water solution.
- (b) What is electrical resistivity? Explain.
- (c) State and prove the Lever rule.

Q.4 Attempt any **FIVE** of the following. **(10)**

- (a) Define (i) Composites and (ii) Biomaterials.
- (b) Explain the Frenkel defect with diagram.
- (c) Explain the degree of polymerization.
- (d) Write a short note on pH sensitive smart materials.
- (e) What is the elastic strain in a copper rod that is stressed to 70 MPa if the modulus of elasticity of Cu is 1,10,000 MPa.
- (f) Describe screw dislocation with diagram.
- (g) Define (i) solvent and (ii) solubility.

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