BACHELOR OF SCIENCE (CBCS-2018 COURSE)
T. Y. B. Sc. Sem-V : WINTER :- 2021

SUBJECT: PHYSICS : ELEMENTS OF MATERIALS SCIENCE

Day : Tuesday
Date 1/2/2022

W-18446-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

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N.B.

1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.

Q 1. Attempt any **Two** of the following. **(12)**

(a) Explain the electrical properties –electrical conductivity & specific resistance.
(b) Explain the cesium chloride (CsCl) structure with diagram.
(c) What is cross linked polymer structure? Explain vulcanization of rubber.

Q 2. Attempt any **Two** of the following. **(12)**

(a) State and explain the Lever rule
(b) Explain the lens type Cu-Ni (Type-I) phase diagram.
(c) Explain mechanical properties of materials – stress, hardness & brittleness.

Q 3. Attempt any **Two** of the following. **(12)**

(a) Write a short note on grain boundaries and twin boundary
(b) Derive an expression for critical resolved shear stress (CRSS)
(c) Define polymer. State its types and important characteristics

Q 4. Attempt any **Three** of the following. **(12)**

(a) Differentiate between addition polymerization and condensation polymerization
(b) State and explain Ficks law of diffusion
(c) An alloy of copper and tin contains 85 w/o copper and 15 w/o tin. Calculate atomic (a/o) of each element. Assume total mass 10000 amu.
(d) What is phase diagram? Explain eutectic type Pb–Sn phase diagram.

Q 5. Attempt any **Four** of the following. **(12)**

(a) Write a short note on ferrites.
(b) Atmospheric pressure of a material of unknown composition shows 4 phases in equilibrium. What is the minimum number of components in the system?
(c) What are the applications of diffusion? Explain.
(d) Differentiate between elastic deformation and plastic deformation
(e) Write a short note on isothermal cut.
(f) Explain any two smart materials.

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