

**K-425**

Total Pages : 3

Roll No. ....

**MSCPH-552**

**MATERIAL SCIENCE**

M.Sc. Physics(MSCPH)

4th Semester Examination, 2023 (Dec.)

**Time : 2 Hours]**

**Max. Marks : 70**

**Note :** This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

**SECTION–A**

**(Long Answer Type Questions)**

**Note :** Section 'A' contains Five (05) long answer type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

(2×19=38)

1. Why mechanical properties of metals are significant? Give some important mechanical properties of metals.
2. What do you mean by polymers? Give the classification of polymers. What are physical properties of polymers?
3. What are zero-, one-, two-, and three-dimensional nanomaterials? Explain the Mechanical grinding method for the preparation of nanostructure materials.
4. What is single crystal? How single crystals are grown? Explain in detail.
5. Give different Methods of Fabricating Thin Films and explain Gas phase fabrication method.

## **SECTION-B**

### **(Short Answer Type Questions)**

**Note :** Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only. (4×8=32)

1. What is the Creep phenomenon? Explain different creep mechanisms.

2. Define flexural strength and explain the flexure test for determining flexural strength.
  3. What are quantum dots and quantum confinement?
  4. What is Chemical Vapour Deposition (CVD) coating?
  5. Explain working principle of magnetron sputtering system for the thin films deposition.
  6. What information does the XRD pattern of a crystal provide?
  7. Explain the working of transmission electron microscope (TEM).
  8. Explain Fourier Transform (FT-IR) spectroscopy.
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