A–098

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MSCPH–552

M.Sc. PHYSICS (MSCPH)

(Material Science)

4th Semester Examination, 2024 (June)

Time : 2:00 Hrs. 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) 2×19=38

***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.

1. Distinguish among biomaterials, advanced materials and smart materials. Out of these materials which one is prefer more and why ?

2. Describe history of ceramics and discuss at least two methods for the preparation of ceramics.

3. Illustrate single crystal growth theory and techniques. What do you understand by the doping techniques of semiconductors ?

4. Explain in details about Differential Thermal Analysis (DTA) and Thermogravimetric Analysis (TGA) used as tools for the analysis of structure.

5. Distinguish between Nuclear Magnetic Resonance (NMR) and Electron Spin Resonance (ESR) spectroscopies.

Section–B

(Short Answer Type Questions) 4×8=32

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.

1. Describe temperature effects on stress-strain curve for metals.

2. Explain the terms used in ceramics such as abrasives, refractaries and brittle fracture.

3. Distinguish between linear chain polymers so and branch chain polymers.

4. Why properties of materials are changed at nano-scale ?

5. Discuss polymerization mechanism.

6. Describe quantum dots and quantum confinement.

7. Illustrate scanning electron microscope.

8. Distinguish between Fourier transform spectroscopy and Raman spectroscopy.

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