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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**MAKE UP EXAMINATION SEP 2023**

**Course Code**: MEC103

**Course Name**: Nanotechnology

**Program & Sem**: B. Tech

**Date**: 05.10.2023

**Time**: 1.00PM – 4.00PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. (5Qx 5M=25M)**

1. Mention the structured design processes in relation to materials.

[5] (C.O.No.3) [Knowledge]

1. What is the standard form of AFM? and who found the term Nanotechnology?

[5] (C.O.No.4) [Knowledge]

1. List out the Applications of Nanotechnology in electronics.

[5] (C.O.No.2) [Knowledge]

1. List and brief at least two mechanical properties of Nanomaterial.

[5] (C.O.No.2) [Knowledge]

1. Define Nanotechnology.

[5] (C.O.No.3) [Knowledge]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. (3Qx15M=45M)**

1. Spectroscopy is the branch of science concerned with the investigation and measurement of spectra produced when matter interacts with or emits electromagnetic radiation. Explain surface enhanced Raman spectroscopy.

[15] (C.O.No.3) [Comprehension]

1. Write a brief note on following.

A) Why did the quest for improved heat transfer in fluids arise, and what approaches were pursued to achieve it?

B) Delve into the world of Nano fluids and their fascinating thermo-physical characteristics.

C) Explore the diverse and innovative applications of Nanofluids that are shaping various industries.

[15] (C.O.No.3) [Comprehension]

1. How do synthetic nanomaterials like "Graphene" impact our world? Explore its fascinating properties, benefits, limitations, and diverse applications in a concise manner.

[15] (C.O.No.2) [Comprehension]

**Part C [Problem Solving Questions]**

**Answer all the Questions. (2Qx15M=30M)**

1. Nanomaterials are often made using wet-chemical synthesis at lower temperatures than gas phase methods. A key liquid phase process is the Sol-gel method, where a sketch can help illustrate. It has pros and cons worth noting.

[15] (C.O.No.2) [Application]

**Q.NO. 10**. How do electron microscopes revolutionize our understanding of the nanoworld, and what are the various types of electron microscopes used in modern scientific exploration?

[15] (C.O.No.3) [Application]