PROBLEM 1.1. Flaws and cracks can play havoc with the performance of structures, so that the nondestructive detection of defects in solids is an essential part of quality control of engineering systems for their safe and successful use in practical situations. This is known as nondestructive testing (NDT), nondestructive evaluation (NDE), nondestructive characterization (NDC), or nondestructive inspection (NDI). Identify and describe in detail (principle, apparatus, applicability, advantages, disadvantages, etc.,) at least two (2) non-optical NDT, NDC, and/or NDI techniques.

PROBLEM 1.2. Identify and describe in detail (principle, apparatus, applicability, advantages, disadvantages, etc.,) at least two (2) optical NDT, NDC, and/or NDI techniques.

PROBLEM 1.3. Identify and briefly describe at least two (2) practice codes, standards, and/or recommendations for NDT (i.e., ASTM standards) with optical techniques.

PROBLEM 1.4. Describe the possible application of optical (non-coherent and/or coherent) NDT, NDC, and/or NDI techniques in your research investigations.