THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Since 1881

Backlog Arrear Examination, March 2021

Crystal growth and Thin film

PGP-5522 **Time: 3Hrs**

Marks:75

Answer ANY FIVE of the following Questions **(5 X 15 = 75)**

1. Explain the Crystal Growth phenomena in detail and derive the net free energy associated with spherical nucleus.
2. Describe the X-Ray diffractometer and explain how is used to determine wavelength of the crystal structure
3. Explain the various Micro hardness testing methods with neat diagram.
4. Draw a neat sketch to describe the Bridgman technique for growing single-crystal using a two-zone furnace.
5. (a) How is vacuum measured using various gauges? Explain it with neat diagram.

   (b)Write a note on different valves pumps in vacuum systems
6. Explain the different PVD techniques used in developing Thin films .Write the advantages and disadvantages of each techniques
7. (a)How will you determine the film thickness its uniformity and purity

   (b) Differentiate homogeneous and Heterogeneous nucleation and derive expression for critical size and critical free energy for heterogeneous nucleation

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