

2020-22

Time : 3 hours

Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

Answer any five questions in which Q. No. 1 is compulsory.

1. Answer any four of the following :

- (a) Explain vacuum gauges.
- (b) Explain indirect reading vacuum gauges.
- (c) Explain neutron scattering.
- (d) Explain Gun plot.
- (e) What do you mean by NAMD ?
- (f) What do you mean by VMD ?
- (g) How thickness of thin film is measured ?
- (h) Explain Linux operating system.

2. Write short notes on the following :

- (a) Cryogenic pumps
- (b) IT – Raman Spectra

3. Describe the principle and working of vacuum pumps. What are the different types of vacuum pumps ? What are its uses ?

4. Describe the principle and working of AFM. Discuss its advantages and disadvantages and how it is used in nanomaterial characterization.

5. What do you mean by thin film ? How metallic thin film can be fabricated by thermal evaporation technique ? What are optical properties of metallic thin films ?

6. Describe the principle and working of FTIR. How FTIR is used to obtain emission and absorption spectra in infra-red regions of solid, liquid or gas ?

7. Describe the principle and working of XRD. How XRD is used to analyse the structure of a given crystal sample ?

8. Explain Monte Carlo simulation technique. Write a FORTRAN program to add three odd integers and output to sum. Explain each line in the program.

9. Write short notes on any two of the following :

- (a) SCILAB
- (b) SEM
- (c) Sputter Deposition Technique
- (d) Ion pumps



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