647510 **MSC3AnaC301x** **Seat No :_____**

M.Sc.(Chem.) Semester - 3 (*CBCS*) Examination
OCT/NOV-2024 (AS PER SYLLABUS YEAR JUNE-2019)
Instrumental Methods of Analysis (Core(New))

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 (A) **Answer the following question** **(04)**

(1) What is Thomson's Scattering?

(2) Explain EMR spectrum.

Q.1 (B) **Answer any two questions out of three.** **(10)**

(1) Write a note on Laue's photographic plate method.

(2) Discuss applications and limitations of XRD technique.

(3) Derive Bragg's equation for path difference.

Q.2 (A) **Answer the following question** **(04)**

(1) Give the principle of MRI technique.

(2) State limitations of MRI.

Q.2 (B) **Answer any two questions out of three.** **(10)**

(1) Explain basic instrumentation of MRI technique.

(2) Discuss T_1 and T2 relaxation with figure

(3) Distinguish between NMR and MRI techniques.

Q.3 (A) **Answer the following question** **(04)**

(1) Explain glass transition temperature in brief.

(2) Name various thermocouples used in DSC.

Q.3 (B) **Answer any two questions out of three.** **(10)**

(1) Give the principle and working of DSC apparatus.

(2) Write a note on factors influencing TGA and DTA analysis.

(3) Give an account of the sequential decomposition reaction that $CaC_2O_4\ H_2O$ undergoes in TGA.

Q.4 (A) **Answer the following question** **(04)**

(1) Give the name of elements which are suitable and not suitable for atomic absorbance spectroscopy technique.

(2) Why atomic absorbance technique is more superior than flame photometry?

Q.4 (B) **Answer any two questions out of three.** **(10)**

(1) Explain Hallow cathode lamp with labelled diagram.

(2) Explain electrochemical atomization with diagram.

(3) Discuss about interferences of atomic absorbance spectroscopy.

Q.5 (A) **Answer the following question** **(04)**

(1) Draw the schematic diagram of laminar flow type burner.

(2) Enlist advantages and limitations of flame photometry

Q.5 (B) **Answer any two questions out of three.** **(10)**

(1) Explain the role of flame in flame photometry and also give the details of fuel and oxidants used in flame photometry.

(2) Write a note on total consumption burner.

(3) Discuss instrumentation of flame photometry.

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