

SEAT No. _____

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SARDAR PATEL UNIVERSITY

M.Sc. (Polymer Science & Technology) Semester-IV Examination-2018

Thursday, 19th April-2018

02:00 P.M to 05:00 P.M

PS04EPST06: ANALYTICAL TECHNIQUES

Total Marks: 70

- Note:** (1) Attempt all questions.
(2) Figures to the right indicate marks.

Q. 1 Answer the following multiple choice questions. 08

- (1) GLP involves _____.
(a) SOPs (b) QAU (c) Both of above (d) None of above.
- (2) Improper calibration of instruments may lead to _____ error.
(a) systematic (b) random (c) both of above (d) none of above.
- (3) _____ generally present in the NaOH decreases the sharpness of the end point during its titration.
(a) NaCl (b) Na₂CO₃ (c) NaHCO₃ (d) None of above
- (4) Frequency μ = _____.
(a) c/λ (b) $1/\lambda$ (c) λ/c (d) none of above
- (5) _____ is required for IR absorption.
(a) Correct wave length (b) Change in dipole moment (c) a & b both (d) None of above
- (6) The wavelength of NIR is _____ cm⁻¹.
(a) 400-4000 (b) 400 -10 (c) 400-100 (d) none of above
- (7) CPD is Known as _____.
(a) Critical Point Drying (b) Crystal Point Drying (c) Commutative Point Drying (d) None of above
- (8) Thermocouple made of _____ is used to measure temperature up to 1750°C in TGA.
(a) Pt-alloys and rhodium (b) Pt-alloys and alumel (c) Pt-alloy and cromel (d) none of above

Q. 2 Attempt **any seven** of the following. 14

- (1) Explain the significance of analytical chemistry.
- (2) Enlist the steps involved in the chromatography techniques.
- (3) Write down various techniques of preparing TLC plates.
- (4) Write a brief note on the requirements of primary standards.

- (5) Describe an Anisotropic effect with one suitable example.
- (6) Explain fragmentation process in mass spectrometer.
- (7) What is the role of thermopile as detector in IR spectrometer?
- (8) Write down the types of crucible and sample preparation used in DSC.
- (9) Discuss about characteristics viewed by SEM.
- Q. 3** (a) What do you mean by validation process? Explain accuracy of method in detail. 06
- (b) Answer the following. 06
1. Molality and Normality.
 2. Expression of analytical results for solid and liquid samples
- OR**
- (b) Discuss the following points of validation process. 06
1. Documenting and archiving.
 2. Linearity.
 3. Quality assurance and control chart.
- Q. 4** (a) Answer the following. 06
1. Instrumentation of GC.
 2. HPTLC.
- (b) Explain various types of paper chromatography in detail. 06
- OR**
- (b) Give an account on the principle and instrumentation of HPLC with neat labelled diagram. 06
- Q. 5** (a) Write a detail note on following 06
1. Instrumentation of FT-IR spectrometer
 2. Fingerprint region
- (b) Explain following mass spectrometers. 06
1. Quadruple mass spectrometer
 2. Time of flight mass spectrometer.
- OR**
- (b) Explain the principle and instrumentation of NMR in detail. 06
- Q. 6** (a) Explain instrumentation of TGA with neat and clean diagram. Discuss about sample preparation and reproducibility. 06
- (b) Explain instrumentation of SEM with neat labelled diagram. 06
- OR**
- (b) Explain following: 06
1. Power Compensated DSC with neat labelled diagram.
 2. TMA.

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