

Total No. of Questions :9]

SEAT No. :

P2903

[Total No. of Pages :4

[5023] - 417

M.Sc. - II

ANALYTICAL CHEMISTRY

CHA - 492: Methods of Analysis and Applications

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) Students should attempt any two sections from section I, II and III.*
- 2) All questions of respective sections are compulsory.*
- 3) Figures to right hand side indicate full marks.*
- 4) Neat labelled diagram must be drawn wherever necessary.*
- 5) Use of log table /non - programmable calculator is allowed.*
- 6) Write the answer of two sections on Separate answer books.*

SECTION - I

(Pollution Monitoring and Control)

Q1) Answer the following:

[10]

- a) What is the composition of particulate matter.
- b) Give control measures of NO₂.
- c) List any two measures for the safety of workers, analyzing particulate matter.
- d) What is industrial effluent?
- e) State any two advantages of electrostatic precipitator.

Q2) Attempt any two of the following:

[10]

- a) Explain the analytical method for the estimation of arsenic from waste water.
- b) Give the method used for recovery of copper.
- c) Write a note on cyclone separator.
- d) Explain SO₂ control measures and it's economics.

P.T.O.

Q3) Attempt any one of the following: [5]

- Discuss effects of atmospheric pollution with respect to particulate matter.
- Explain in brief photochemistry of air pollutions.

SECTION - II

(Analysis of Body fluids)

Q4) Attempt the following: [10]

- What is polyuria and anuria?
- What is GTT? What are the factors affecting GTT?
- Write the structure and deficiency diseases of tocopherol.
- What is ELISA?
- Write the principle of Van-der Bergh method.

Q5) Attempt any two of the following: [10]

- Write the principle of radioimmunoassay. Describe the application of radioimmunoassay in estrogen determination.
- Give an analytical method for the estimation of Na from blood serum.
- Explain collection, preservation and changes on keeping of blood.
- Two patients shows following readings during the analysis of urea clearance -

Patient No.	Blood urea (mg %)	Urinary Urea (mg%)	Rate of Urine flow (ml/min)
1	85	2200	2
2	70	2300	1

Calculate the urea clearance for each patient and comment on the results.

Q6) Attempt any one of the following:

[5]

- Give an analytical method for the estimation of serum xanthuric.
- Four times diluted urine sample of a 45 years patient required 9.5 ml of Benedicts Reagent during analysis of it's glucose content. Routine blood analysis of the same patient shows following readings.

Test	Method	O.D. of Sample	O.D. of Std.
Urea	DAM	0.110	0.115
Uric Acid	Caraway's	0.090	0.150
Phosphate	TCA	0.088	0.110
Creatinine	Picric acid	0.009	0.050

Calculate the concentration of each component present in per 100 ml of the sample.

SECTION - III

(Carbon-Nanostructures and Application of Nanotechnology)

Q7) Attempt the following:

[10]

- What is coulomb blockade?
- What are sensing parameters in physical and chemical sensors?
- Explain the term Quantum Dots.
- Give Major routes of entry for engineered nanomaterials in the body.
- Define
 - Carbon Nanotubes
 - Nanowires

Q8) Answer any two of the following: **[10]**

- a) Write a short note on vibrational and mechanical properties of nanotubes.
- b) Explain electrochemical sensors and bio-membrane based sensors.
- c) Describe the applications of carbon nanotubes.
- d) Explain the role of fungi in nanoparticle synthesis.

Q9) Answer any one of the following: **[5]**

- a) Explain the fabrication of carbon nanotubes.
- b) Write a short note on Nanoparticle toxicology.

