

SUBJECT : ANALYTICAL TECHNIQUES

Day : Thursday
Date : 01/11/2018

W-2018-1196

Time : 10.00 AM TO 01.00 PM
Max. Marks : 80

N. B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in the **SEPARATE** answer books.

SECTION - I

Q.1 A) Attempt **ANY ONE** of the following: (06)

- i) Explain the gravimetric estimation of calcium from industrial effluents.
- ii) Describe the principle of chromatography. Add a note on various types of chromatographic technique with their applications.

B) Attempt **ANY TWO** of the following: (10)

- i) List the different types of centrifuge. Explain the various applications of centrifugation technique in biotechnology.
- ii) Describe the principle of HPLC. Explain the various types of HPLC technique.
- iii) What is titrimetry? Explain titrimetric analysis of water.

Q.2 Write short notes on **ANY FOUR** of the following: (16)

- i) Flame photometry
- ii) pH meter
- iii) Bray and Krutz's method of phosphate estimation
- iv) Spectrophotometer
- v) Kjeldahl's method of nitrogen estimation

SECTION - II

Q.3 A) Attempt **ANY ONE** of the following: (06)

- i) Discuss the principle and applications of lyophilization.
- ii) Explain membrane filtration technique with its applications.

B) Attempt **ANY TWO** of the following: (10)

- i) Describe various methods of food preservation.
- ii) Describe principle and types of laminar air flow systems.
- iii) Explain principle of spectrophotometer.

Q.4 Write short notes on **ANY FOUR** of the following: (16)

- i) Reverse osmosis
- ii) Nutraceuticals
- iii) Density gradient centrifugation
- iv) Agarose gel electrophoresis
- v) Affinity chromatography

Q.5 Attempt **ANY EIGHT** of the following: (16)

- i) What is isopycnic density?
- ii) Name different types of filtration technique.
- iii) What are toxic effects of fluoride and arsenic from water?
- iv) Name cation exchange resin.
- v) What is $[\text{OH}^-]$ of solution that has pH 10?
- vi) What is the role of salt in food preservation?
- vii) Name 2 lyophilized products commercially available in market.
- viii) Name two stabilizers used in food industry.
- ix) How much NaCl is required for preparing 100 ml solution containing 50 ppm of Na [mol. wt. of NaCl = 58.46, Na = 23]