

Day : Friday  
Date : 03/11/2017

W-2017-0957

Time : 02.00 PM TO 05.00 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) Describe various types of centrifuges and their applications in biotechnology industries.
  - ii) What is HPLC? What are its applications in research and quality control?
- B) Attempt **ANY TWO** of the following: (10)
- i) Differentiate between single beam spectrophotometer and double beam spectrophotometer.
  - ii) What are the toxic effects of fluoride, chloride, sulphate and arsenic from potable water?
  - iii) Explain the principle behind electrophoresis. What are the factors affecting electrophoretic separation.
- Q.2** Write short notes on **ANY FOUR** of the following: (16)
- i) Kjeldahl's method of nitrogen estimation
  - ii) Care of pH electrodes
  - iii) Flame photometry
  - iv) Principle involved in pH meter
  - v) Bray and Krutz's method of phosphate estimation

**SECTION - II**

- Q.3** A) Attempt **ANY ONE** of the following: (06)
- i) Explain various components of HPLC. Add a note on its biotechnological applications.
  - ii) List various types of filtration. Explain their merits and limitations.
- B) Attempt **ANY TWO** of the following: (10)
- i) Describe the various types of laminar air flow systems.
  - ii) Describe reverse osmosis in detail.
  - iii) Explain different methods of food preservation.
- Q.4** Write short notes on **ANY FOUR** of the following: (16)
- i) Purification of proteins by chromatography
  - ii) Aseptic methods
  - iii) Agarose electrophoresis
  - iv) Ultra filtration
  - v) Types of centrifuge rotors
- Q.5** Attempt **ANY EIGHT** of the following: (16)
- i) What is the  $[H^+]$  of a solution that has pH 6?
  - ii) What is the role of sugar in food preservation?
  - iii) What is the density gradient centrifugation?
  - iv) Name two preservatives used in food industry.
  - v) State Beer's Lambert's law.
  - vi) Name strong cation and anion exchange resins.
  - vii) Why phosphate is essential for plants?
  - viii) What is titrimetry?
  - ix) Name different types of electrophoresis.