

Day: Wednesday

Date: 02/05/2018

S-2018-3912

Time: 10.00 AM TO 01.00 PM

Max. Marks: 60

**N.B:**

- 1) Q. No. 1 and Q. No. 5 are **COMPULSORY**. Out of the remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to the both sections should be written in **SEPARATE** answer books.
- 4) Draw neat and labeled diagram **WHEREVER** necessary.

**SECTION - I**

- Q.1** Attempt **ANY FIVE** of the following: (10)
- a) What is vapour recompression?
  - b) Classify drying equipments.
  - c) Enlist different types of heat exchangers.
  - d) What is H.E.T.P.?
  - e) Draw labeled diagram of forced circulation evaporator.
  - f) Enlist steps involved in freeze-drying process.
- Q.2** a) Classify evaporators. Explain principle and working of multiple effect evaporator. (06)
- b) Explain principle and working of mechanical traps. (04)
- Q.3** a) Derive an expression for heat transfer between fluid and solid boundary. (06)
- b) Explain principle and working of spray dryer. (04)
- Q.4** Write short notes on **ANY TWO** of the following: (10)
- a) Theory of drying
  - b) Scale formation
  - c) Packings in column

**SECTION - II**

- Q.5** Attempt **ANY FIVE** of the following: (10)
- a) What is anti-solvent crystallization?
  - b) Give ideal characteristics of containers and closures.
  - c) Enlist the interactions between primary packaging material and the included pharmaceutical product.
  - d) Classify crystallizers.
  - e) What is caking of crystals?
  - f) Enlist advantages and disadvantages of plastic as a packaging material.
- Q.6** a) Enlist techniques of granulation. Explain principle and working of fluid bed granulator. (06)
- b) Add a note on crystallization by cooling. (04)
- Q.7** a) Explain in detail theories of crystal growth. (06)
- b) Explain the concept of spray drying and congealing. (04)
- Q.8** Write short notes on **ANY TWO** of the following: (10)
- a) Mier's theory of supersaturation.
  - b) Measurement of humidity.
  - c) Comparison of glass and metal as a primary packaging material.