

Total number of printed pages—4

53 (FPT 702) FPED

2017

FOOD PROCESS EQUIPMENT DESIGN

Paper : FPT 702

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. (a) Explain about the following properties of materials used in the construction of food processing equipments. 3×2=6
 - (i) Mechanical strength
 - (ii) Corrosion resistance
 - (iii) Hygienic properties
- (b) Write short notes on stainless steel which is used to design food plant equipments. 4
- (c) Explain the points/factors which has to be considered in the fabrication of food plant equipments. 10

Contd.

2. (a) Explain *any four* constructional characteristics involved in the selection of a food processing equipment. 8
- (b) Draw the neat sketch for the following :
(any two) $2 \times 4 = 8$
- (i) Segmented belt conveyor
- (ii) Roll and skate wheel conveyors
- (iii) Screw conveyors.
- (c) Write the equations representing the maximum capacity of belt and screw conveyors. $2 + 2 = 4$
3. (a) List the selection criteria to choose a suitable mechanical conveyor. 4
- (b) Classify the Motor-driven steady motion mechanical conveyors. 4
- (c) Explain the working principle of pneumatic conveyors with proper schematics. 8
- (d) Write about the classification of heat exchangers according to the fluid flow arrangement. 4

4. (a) Explain the following parts in the designing of a shell and tube heat exchangers.

(i) Shell side and tube side passes

(ii) Baffles and tie rods.

6+4=10

(b) Describe the arrangement of tube sheets in shell and tube heat exchangers and explain about the determination of effective tube sheet thickness. 10

5. (a) Write short notes on the following heat exchangers. 5+5=10

(i) Spiral heat exchangers

(ii) Graphite heat exchangers.

(b) Write short notes on the following equipments 4+3+3=10

(i) Cylindrical separators

(ii) Weight sorter

(iii) Sorters based on colour.

6. (a) Define the term — “Screening”. 2
- (b) Write short notes on sieve sizes. 5
- (c) Explain the following screening systems
- (i) Trammels
 - (ii) Flat screens
 - (iii) Screening clothes
 - (iv) Magnetic separators
 - (v) Electrostatic separators.
- 3+3+3+2+2=13

7. (a) Write about the selection of material for constructing pressure vessels. 10
- (b) Explain about the design conditions and stresses for pressure vessels. 10
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