*Total number of printed pages–3*



**53 (FPT 702) FPED**

**2021**

**( Held in 2022 )**

# FOOD PROCESS EQUIPMENT DESIGN

Paper : FPT 702

*Full Marks : 100*

Time : Three hours

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

1. *(a)* Explain the properties of following materials which are used in construction of a food equipment : 6+4=10

   *(i)* Steel

   *(ii)* Plastics.

   *(b)* Discuss about the different stresses which influence the strength of food processing equipment and mention the preventive measures also. 10

*Contd.*

2. *(a)* Briefly elaborate the construction characteristics involved in the selection of food processing equipment. 10

*(b)* Describe in brief about the working mechanism of pneumatic conveying systems. 10

3. *(a)* Provide the schematic diagrams of segmented belt conveyor, screw conveyor and chain conveyor. 6

*(b)* Briefly discuss about the working principle of chain conveyor with schematic diagram. 8

*(c)* Provide a short note on the working mechanism of vibratory conveyors. 6

4. *(a)* What is a heat exchanger ? How are heat exchangers classified ? 6

*(b)* Give a detailed schematic representation of shell and tube heat exchanger. 6

*(c)* Discuss in brief about the basic components/basic structure of plate-type heat exchangers. 8

5. *(a)* Define the term, effective thickness of tube sheet and explain the procedure for the calculation of effective thickness of tube sheet. 10

*(b)* Write short notes on the following components of shell and tube heat exchangers : 5+5=10

*(i)* Baffles and Tie rods

*(ii)* Shell-side and tube-side passes.

6. *(a)* Provide the schematic diagrams of cylindrical separators and rotating disk separators. 4

*(b)* Define the term 'Grading' and discuss briefly about hand grading process. 8

*(c)* Explain the working principle of screening cloths, magnetic separators and electrostatic separators. 2+3+3=8

7. *(a)* Write a brief note on the designing of different types of heads or covers for pressure vessels. 10

*(b)* Briefly explain about the uses of different types of nozzles in the construction of pressure vessels. 10