

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- APRIL-2023

COURSE CODE(CREDITS): 21B1WBT831 (03)

MAX. MARKS: 25

COURSE NAME: Food Processing and Engineering

COURSE INSTRUCTORS:Dr Anil Kant

MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q.1

- a. What are tubular heat exchangers? Describe the design elements of 2-4 heat exchanger with the help of labeled diagram. [3] COIV
- b. Based on your knowledge about different heat exchange equipments, which equipment would you recommend for following operations? Describe its design, operations and advantages it will offer wrt given process. [5] COIII, IV
 - i. Heating of material, when viscosity and rheological behavior of product changes abruptly
 - ii. Pasteurization /chilling of free flowing liquid food material which may be heat sensitive

Q.2

- a. A grinding equipment requires 10kWh for grinding a material at the rate of 200 kg/hour from 1 cm to 1mm. How much power is required if material is to be ground up to 0.1mm size? Do calculations using the Rittinger law of grinding. [3] COIII
- b. How much power is required to grind a material at a rate of 4 t/h such that 80% of feed passes through 5mm opening and 80% of product passes through 0.5 mm opening. Given bond work index of material is 10kWh/t [3] COIII
- c. Write down the equation of crushing efficiency and elaborate various parameters in it. Mention two discrete points which are attributed to low crushing efficiency in most grinding operations. [2] COIII

Q.3

- a. Describe the general design and working of any three of following equipment i) Pulping equipment. ii) Gravity separator iii) Cyclone separators iii) Telescope centrifuge iv) bowl centrifuge [6] COIV
- b. Enlist size separation applications in the food processing Industry? [3] COIV