KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Food Engg. & Tech.) 2019 Admission

III Semester-Final Examination-February 2021

Fden.2104   **Crop Process Engineering (2+1)**   **Marks: 50**
                                                                          Time: 2 hours

I   **Match the Following**   **(10x1=10)**
        1. Size reduction   a. Wet bulb
        2. Parboiling   b. Reducing moisture to safe limit
        3. Psychrometry   c. Paddy
        4. Vibratory screens   d. Work index
        5. Drying   e. Grain cleaning

        State True or False
        6. Indented cylinder separator separates grain on the basis of their relative length.
        7. Temperature for starch gelatinization in paddy parboiling is about 70 ^{0}C.
        8. In attrition mill, size of grain is reduced by shear and impact.
        9. Corn milling seldom involves dry and wet milling process.
        10. The moisture content of product from where constant rate drying ceases and falling rate drying starts is called as the critical moisture content.

II   **Write Short notes on any FIVE of the following**   **(5x2=10)**
        1. Differentiate cleaning and grading.
        2. Explain importance of equilibrium moisture content (EMC).
        3. Explain semolina in wheat milling process.
        4. Calculate critical speed and operating speed of rotation in revolutions per minute of a ball mill of 2000 mm diameter charged with 100 mm balls. The rotational speed of the ball mills are kept at 80 % of the critical speed. Assume the ball mill grinding solid matter.
        5. Explain pretreatments of pulses
        6. Enlist different types of breakfast cereals food.
        7. Explain extrusion process for extruded products.

III   **Answer any FIVE of the following.**   **(5x4=20)**
        1. In a wheat milling experiment it was found that to grind 4.33 mm sized grains to IS sieve 35 (0.351 mm opening), the power requirement was 8 kW. Calculate the power requirement for milling of wheat by the same mill to IS sieve 15 (0.157 mm opening) using (1) Rittinger's law and (2) Kick's law. Feed rate of milling is 200 kg/hr.
        2. Draw layout of modern rice mills processed products from rice milling system.
        3. Explain CFTRI method of parboiling for paddy.
        4. During the evaluation of an air screen grain cleaner with two screens the following were observed.
            i. The impurities present in feed were 6.5 %
            ii. The impurities present in clean grain were 0.5 %
            iii. The outflow of blower contained 0.2 % clean seed
            iv. The overflow of the 1st screen contained 1 % clean seed
            v. The underflow contained 0.5 % clean seed

Compute the cleaning efficiency of the cleaner.
5. 800 kg of paddy at 24 % moisture content (wb) is dried to 13 % moisture content (wb) for milling. Calculate the amount of moisture removed in drying.
6. Explain Jaw and gyratory crushers with neat sketches.
7. Write tempering-degerming (T.D.) method for corn dry milling.

IV   **Write an essay on any ONE of the following**   **(1x10=10)**
1. Explain drying theory with various points like thin layer drying, deep bed drying, constant rate period, falling rate period and drying curves for grains. Also write effects of different factors on the drying process.
2. What are the important points to be kept in mind while selecting the conveyor? Describe screw conveyors in details with neat sketch and formula.

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