Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14FP2031** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DRYING TECHNOLOGY** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain various moisture contents involved in drying calculations and state their significance. | CO1 | 6 |
| b. | Distinguish drying from evaporation process. | CO3 | 6 |
| c. | Explain the mechanism of drying involved in constant rate period and falling rate period. | CO2 | 8 |
| (OR) | | | | |
| 2. | a. | Slabs of paper pulp 100cm x 100cm x 1.5cm is to be dried under constant drying conditions from 67% to 30% moisture. The value of equilibrium moisture for the material is 0.5%. If the critical moisture content is 60% and the rate of drying at the critical point is 1.5 kg / (m2.h), calculate the drying time. The dry weight of each slab is 2.5 kg. All moisture contents are on wet basis. The falling rate may be assumed to be linear. | CO2 | 14 |
| b. | Define relative humidity, percentage humidity and humid heat. | CO1 | 6 |
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| 3. | a. | What type of dryer is suitable for drying granular soilds, explain with neat sketch its principle and operation. | CO1 | 10 |
| b. | What does lyophilization mean? What type of food products can be dryied by this method? Explain with one example. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the operation of tunnel dryer with neat sketch. | CO2 | 10 |
| b. | Discuss about various classifications of dryers in detail. | CO3 | 10 |
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| 5. |  | A batch of solids is to be dried from 28% to 6% moisture on wet basis. The initial weight of the solid is 380 kg and the drying surface is 0.15m2/40 kg of dry weight. The critical moisture content is 18% dry basis and the constant drying rate is 0.32 Kg/m2h. For the falling rate period, the following data are available.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Moisture content, % dry basis | 25 | 21.9 | 19 | 16 | 13.6 | 11 | 8.2 | 7.5 | 6.4 | | Rate of drying Kg/m2.h | 0.3 | 0.27 | 0.24 | 0.21 | 0.18 | 0.15 | 0.07 | 0.044 | 0.025 | | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Explain with neat sketch the principle and operation of spray dryer. | CO2 | 10 |
| b. | What are the merits and demerits of flash drying over spray drying? | CO2 | 10 |
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| 7. | a. | What is the principle behind osmotic dehydration? Mention the limitations and advantages of osmotic dehydration. | CO3 | 10 |
| b. | What is the advantage of fluidized bed dryer over other dryers? What type of materials can be dried in fluidized bed dryer? Explain with neat sketches. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Describe foam mat drying with suitable example. | CO2 | 12 |
| b. | What are the merits and demerits of vacuum drying? | CO2 | 8 |
|  | | | | |
|  | | **Compulsory**: |  | |
| 9. | a. | Explain the principle and operation of tray dryer with a suitable sketch. | CO2 | 15 |
| b. | What is microwave drying? Mention its significance. | CO3 | 5 |