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Code No: RT31353



SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018 AGRICULTURAL PROCESS ENGINEERING

(Agricultural Engineering)

| ſ | Time: 3 | b hours Max. Marks | Marks: 70 | |
|---|---------|---|-----------------|--|
| _ | | Note: 1. Question Paper consists of two parts (Part-A and Part-B) 2. Answering the question in Part-A is compulsory 3. Answer any THREE Questions from Part-B | | |
| | | <u>PART –A</u> | | |
| 1 | a) | With a neat sketch describe the working principle of a ball mill. | [4M] | |
| | b) | Write down different mixers used for dry powder and particulate food. | [3M] | |
| | c) | Describe the working principle of Air screen grain cleaner. | [4M] | |
| | d) | With a neat sketch describe the working principle of rotary dryer. | [4M] | |
| | e) | Write down the advantage of paddy parboiling. | [3M] | |
| | f) | Describe the working principle of bucket elevator. | [4M] | |
| | | PART -B | | |
| 2 | a) | Define crushing efficiency. | [4M] | |
| | b) | Describe Bond's law of size reduction and work index. | [6M] | |
| | c) | What would be the critical speed and operating speed of a ball mill having 200 | [6M] | |
| | | cm diameter charged with 10 cm balls to grind viscous suspension. | | |
| | | | | |
| 3 | a) | Define power number. What are the factors responsible for the power requirement of fluid mixing? | [8M] | |
| | b) | Describe the working principle of kneader mixer in detail. | [8M] | |
| | | | | |
| 4 | a) | Derive an expression for terminal velocity of spherical particle in gravitational | [9M] | |
| | | field. | | |
| | b) | What are the design considerations for air screen cleaner? | [7M] | |
| _ | ` | | [7] (1 | |
| 5 | a) | What is hysteresis effect? | [5M] | |
| | b) | Describe free moisture, bound and unbound moisture. | [5M] | |
| | c) | Two tonnes of paddy at 40 % initial moisture content (d.b.) is dried in a dryer to a final moisture content of 20 % (d.b.) in 4 hours. Calculate the average rate of moisture removal | [6M] | |
| | | or moisture removal. | | |

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| 6 | a) | Describe the working principle of plate and frame filter press. | [6M] |
|---|----|---|-------|
| | b) | Describe the dry milling process of pulse milling. | [5M] |
| | c) | Write down different steps of wheat milling. | [5M] |
| 7 | a) | Write down the different components of belt conveyor. | [6M] |
| | b) | A horizontal screw conveyer mounted on a 4cm diameter shaft has screw pitch and diameter both equal to 30cm. Estimate its actual capacity of conveying wheat weighing 850 kg/m ³ while operating at 150 rpm. Assume loading efficiency to be 0.4. For a screw length of 8m what horse power motor will be required if the total co-efficient of resistance is 2.5. | [10M] |

