Code No: RT31353 **R13** SET - 1

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

AGRICULTURAL PROCESS ENGINEERING

(Agricultural Engineering)

Time: 3 hours Max. 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**

PART –A

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 cm diameter charged with 10 cm balls to grind viscous suspension.	[6M]
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 field.	[9M]
	b)	What are the design considerations for air screen cleaner?	[7M]
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]

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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]

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