QPC: RD20BTECH371

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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fifth Semester – Regular) Examinations, December – 2022 **BPCAG5014 – Post-harvest Engineering of Cereals, Pulses and Oilseeds**(AGE)

Time: 3 hrs Maximum: 70 Marks **Answer ALL Questions** The figures in the right hand margin indicate marks. **PART – A: (Multiple Choice Questions)** $(1 \times 10 = 10 \text{ Marks})$ [CO#] [PO#] Q.1. Answer ALL questions and processes used to remove the bran layer from the brown rice 1 Abrasion and friction (ii) Shear and friction (i) Abrasion and shear All of the above (iii) (iv) In grain drying, end of constant rate period and start of falling rate period is known as_____ (i) Equilibrium moisture content (ii) Critical moisture content (iii) Isotherm moisture content (iv) Equilibrium moisture content The vertical polishing cone is made of steel and is covered with wood on which _____ have been 1 (i) Leather strips (ii) Rubber brakes (iii) Wooden strips (iv) PVC material brakes In continuous -flow mixing type dryer, the temperature of drying air is _____ without damaging 1 the grains (ii) 70 - 75 °C (i) 65-75 °C (iii) $60-70^{\circ}C$ (iv). 55 - 70 °C is used to measure the dry and wet bulb temperature 2 1 Air Hygrometer (ii) Sling psychrometer (i) (iii) Digital thermometer (iv) Pycnometer In _____ rice milling equipment, under slight pressure, the remaining bran is removed and the 1 rice becomes shiny and glossier (i) Vertical whitening cone (ii) Horizontal abrasive whitener (iii) Jet pearler (iv) Horizontal polisher The number of cubic meters of moist air per kilogram of dry air is called _____ 3 1 (i) Specific volume (ii) Unsaturated volume of air (iii) Saturated volume of Air (iv) Partial saturated volume of air Which dryer is used to dry the material almost instantaneously in a turbulent stream of hot air 1 (i) Fluidized bed dryer (ii) Drum dryer (iii) Cabinet tray dryer (iv) Pneumatic dryer _____ is continuous flow non-mixing type of grain dryer 1 (i) Cabinet dryer (Tray dryer) Rotary dryer (iv) Baffle dryer (iii) Recirculatory type batch dryer Pressure in air-vapour mixture to the saturated water vapour pressure in air at same temperature is 1 known as (i) Specific humidity (ii) Absolute humidity (iii) Percentage humidity (iv) Relative humidity **PART – B: (Short Answer Questions)** $(2 \times 10 = 20 \text{ Marks})$ Q.2. Answer **ALL** questions [CO#] [PO#] State the difference between Critical Moisture content and Equilibrium moisture content in drying 1 of Agricultural Products Define (i) brown rice and (ii) milled rice 1 1

c.	Define Psychrometric chart and state which thermodynamic properties of moist air are represented by Psychrometric chart	2	1
d.	Define Abrasion and Friction Process of removal of bran layer from the surface of the brown rice	2	1
e.	Define Grading and Cleaning of paddy	2	1
f.	Enlist different types of dryers use for grains drying	3	1
g.	State the grain/particles paths in cleaner and separators	3	1
h.	Define EMC (Equilibrium Moisture Content) and write down the Name of EMC Models which are used in grains drying process	3	1
i.	Define parboiling of paddy and state the main objectives of parboiling of paddy	4	1
j.	Write on the basis of which properties the below said separators separate the grain material	4	1
	 i. Indented cylinder separator ii. The specific gravity separator iii. Spiral separator iv. Pneumatic and aspirator separator 		
PA	RT – C: (Long Answer Questions) (10 x 4 =	= 40 Ma	rks)
Ansv	Answer ALL questions Market		PO#

PART – C: (Long Answer Questions)			$(10 \times 4 = 40 \text{ Marks})$			
Answer ALL questions		Marks	CO#	PO#		
3. a.	State the different sections of Rubber Roll Sheller by schematic diagram and describe the working principle of Robber Roll Sheller.	he 6	1	1		
b.	Explain the use of Cyclone Separator in rice milling industry	4	1	1		
	(OR)					
c.	Show the basic flow chart of rice milling process	5	1	1		
d.	Indicate the different by-products of rice milling and state its commercial use	5	1	1		
4. a.	State the different sections of LSU dryer (Louisiana State University dryer and explain the air distribution system in drying chamber.	ne 6	2	1		
b.	Explain types of air flow in mechanical drying system	4	2	1		
	(OR)					
c.	Enlist the Rice milling equipment / Machines as per unit operations wise of Rice Milling	5	2	1		
d.	Describe the operation of Flat Bed Type Batch Dryer for on-farm drying of Agricultur Product	al 5	2	1		
5. a.	Determine the value of EMC (M_e) using Henderson's EMC Model for the drying of paddrying at 40° C and 50% of RH (Relative Humidity of Hot air. The values of constants ' $C = 2.32 \times 10^{-5}$ and ' $C = 1.98$ were taken.		3	1		
b.	Explain Desorption EMC and Absorption EMC by curve	4	3	1		
	(OR)					
c.	Describe the working of Rotary Air Screen Cleaner	6	3	1		
d.	Enlist different EMC Models use to predict the EMC values in drying of Agricultur Products and state the equation of Henderson's EMC Model Henderson's EMC Model		3	1		
6. a.	Describe the working of Deep bed dryer with schematic diagram	5	4	1		
b.	Explain the Constant drying and Falling drying rate with drying curve shows the characteristics of drying of Agricultural Products	he 5	4	1		
	(OR)					
c.	Describe different types of Screens opening use in screener/cleaner equipment for cerear pulses and oil seed crops.	al, 5	4	1		
d.	State the Advantages and Disadvantages of Rotary Dryer	5	4	1		