

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BVoc DEGREE EXAMINATION MAY 2026
(Second Semester)**

Branch -FOOD PROCESSING TECHNOLOGY

FOOD PROCESS ENGINEERING

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Water activity (aw) of a food material is defined as: (i) Ratio of vapor pressure of food to pure water (ii) Total moisture content (iii) Equilibrium moisture (iv) Relative humidity	K1	CO1
	2	Which instrument is used to measure moisture content indirectly? (i) Oven drying method (ii) Karl Fischer titration (iii) Infrared moisture meter (iv) Distillation method	K2	CO1
2	3	A specific gravity separator works on the principle of: (i) Size difference (ii) Shape difference (iii) Density difference (iv) Color difference	K1	CO2
	4	Which grader uses optical sensors to separate materials? (i) Cylinder separator (ii) Spiral separator (iii) Colour sorter (iv) Magnetic separator	K2	CO2
3	5	During the falling-rate period of drying: (i) Surface moisture evaporates rapidly (ii) Internal moisture diffusion controls the rate (iii) Temperature remains constant (iv) Drying rate is maximum	K1	CO3
	6	Rittinger's law for size reduction states that energy required is proportional to: (i) Volume reduction (ii) Surface area increase (iii) Particle diameter (iv) Square of particle size	K2	CO3
4	7	Which size reduction equipment uses impact as the primary mechanism? (i) Jaw crusher (ii) Hammer mill (iii) Rolling mill (iv) Attrition mill	K1	CO4
	8	Cryogrinding is preferred for heat-sensitive materials because: (i) It increases moisture content (ii) It operates at very low temperatures preventing thermal degradation (iii) It reduces particle size uniformly (iv) It enhances flavor	K2	CO4
5	9	Which conveyor system is best suited for vertical transportation of grains? (i) Belt conveyor (ii) Screw conveyor (iii) Bucket elevator (iv) Pneumatic conveyor	K1	CO5
	10	High Pressure Processing (HPP) inactivates microorganisms primarily by: (i) Heat generation (ii) Disruption of cellular structures due to pressure (iii) Chemical reaction (iv) Radiation exposure	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the importance of engineering properties of food materials in designing crop processing equipment.	K2	CO1
		(OR)		
	11.b.	Describe direct and indirect methods of moisture content determination with their merits and demerits.		
2	12.a.	Deduce the working principle and applications of vibratory air-screen cleaner and specific gravity separator	K3	CO2
		(OR)		
	12.b.	Describe the construction and operation of colour sorter and spiral separator with suitable diagrams		
3	13.a.	Explain the constant-rate and falling-rate periods of drying with neat sketch and analysis the factors affecting drying rate	K4	CO3
		(OR)		
	13.b.	Compare Rittinger's, Bond's and Kick's laws of size reduction. Which law is applicable for fine grinding and why?		
4	14.a.	Examine the principle and operation of groundnut decorticator (hand operated and motorized).	K4	CO4
		(OR)		
	14.b.	Elucidate the design considerations and applications of belt conveyor and pneumatic conveyor systems in food processing		
5	15.a.	Evaluate the principle, advantages and applications of Pulsed Electric Field (PEF) technology in food processing	K5	CO5
		(OR)		
	15.b.	Interpret Cold Plasma technology: its generation, mechanism of action and applications in food preservation		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Survey the significance of psychrometric chart in food drying operations with a neat sketch. and examine temperature and relative humidity affect EMC?	K4	CO1
2	17	Classify various cleaning and grading equipment used in food processing. Examine the working principle, construction and performance evaluation of rotary air-screen cleaner with diagrams.	K4	CO2
3	18	Discuss the principles of thin layer and deep bed drying. Derive the expression for prediction of drying time.	K5	CO3
4	19	Interpret the role of Automated Guided Vehicles (AGV) and Automated Storage & Retrieval Systems (AS/RS) in modern food warehouses.	K5	CO4
5	20	Compare Ohmic Heating and High Pressure Processing (HPP) technologies with respect to principle, equipment, advantages, limitations and food applications.	K6	CO5

Z-Z-Z END