END SEMESTER/ RE-TEST EXAMINATION, 2020

Semester: 5th

Subject code: FPT-502

FOOD ENGINERRING OPERATIONS-I

Full Marks: 70 = (part A-25 + Part B- 45)
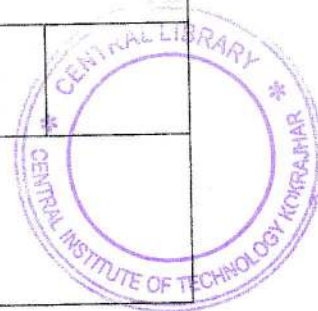
Duration: 3 hours

Instructions:

1. Questions on Part A are compulsory

2. Answer any five questions from Part B

Questions no.	questions	marks
	PART-A	
	MARK-25	
Question 1	Fill in the blanks:	1x5=5
1a	In disc separator, the adjustable component for separation is _____ .	
1b	Cyclone separators separates materials on the basis of _____ .	
1c	Jaw crusher is of two types 1. Dodge type and 2nd is _____ .	
1d	In a ball mill, most of the size reduction is achieved by _____ which methods.	
1e	Pascal is a unit of _____ .	
Question no.2	Write true or false:	1x10=10
2a	Size reduction means decrement of size.	
2b	Mass neither be created nor be destroyed : As per laws of conservation of Mass	
2c	Bucket elevators is used to transport materials with in the plant premises	
2d	Pneumatic conveying is the excellent methods of transporting powders in closed containers.	
2e	Hammer mill categorized under grinding	
2f	Ultra-filtration is a classic example of cross-flow filtration	
2g	Diatomaceous earth is used as filter aid	
2h	The tension developed at the drive pulley in transmitting the required powder to move the loaded belt is known as effective tension.	
2i	Operation of hammer mill is an example of dynamic force application by impact.	
2j	Holding time under high temperature short time milk pasteurizer is	

	15 second.	
Question no. 3	Choose the correct answer	1x10=10
Q 3a	Belt conveyor is used in	

i. Material transportation over long distance
ii. Material transportation with in the premises
iii. Both a & b
iv. Lifting of materials

3b	HTST pasteurization means	

i) High temperature simple tank
ii) High time short temperature
iii) High temperature short time
iv) High time small temperature

3c	The hammer mill is used to reduce the size by	

i. Shear
ii. Impact
iii. Cutting
iv. Crushing

3d	In which process of size reduction, minimum deformation and rupture results and the new surface created is more or less undamaged	

i. Impact
ii. Compression
iii. Cutting
iv. Crushing

3e	The size of the agricultural products may be reduced by	

i. Shear
ii. Impact
iii. Crushing an compression
iv. All of the above

3f	When a material is subjected suddon blow of force in excess of its strength, if fails is called	

i. Shear
ii. Impact
iii. Cutting
iv. Crushing

3g	The process of heat treatment in which partial cooking of product takes place to inactivates and destroys the enzymes	

i. Blanching
ii. Cooking
iii. Deep-fat frying
iv. Roasting

3h	Transpiration of powder materials inside the plant is takes place	

	using	
	i. Bucket elevator	
	ii. Belt conveyors	
	iii. Pneumatic conveyors	
	iv. None of the above	
3i	Law of grinding which is more applicable for fine grinding is	
	i. Bond'S Law	
	ii. Kick'S law	
	iii. Rittinzer'S Law	
	iv. None of the above	
3j	In which process of size reduction, minimum deformation and rupture results and the new surface created is less or more undamaged.	
	i. Impact	
	ii. Compression	
	iii. Crushing	
	iv. Cutting	

PART-B MARK- 45 Marks (9x5 marks)		
Questions no.	Questions	Marks
Question no. 4		
Q4a	Write the law of conservation of energy?	3 marks
Q4b	Write all different steps to be followed during energy balances.	6 marks
Question no.5		
Q5a	What is the importance of material handling in food processing?	3 marks
Q5b	Describe a pneumatic conveyor with a neat diagram and its application in food processing.	6 marks
Question no. 6		
Q6a	Write all laws associated with size-reduction operations	3 marks
Q6b	Explain the functioning of hammer mill with a neat diagram.	6 marks
Question no. 7		
Q7a	Compare and contrast dehydration and drying	3 marks
Q7b	In a rice milling industries, it was found that to grind 4.33 mm sized grains to sieve opening of 0.351 mm, the power requirement was 8 KW. Calculate the power requirement for milling of rice by the same mill to sieve opening of 0.157 mm with a feed rate of milling is 200 kg/hr using Kick'S law.	6 marks
Question no. 8	Differentiate the following	

Q8a	Crushing and Grinding	3 marks
Q8b	Jaw crusher and Gyratory crusher	3 marks
Q8c	Drying and Dehydration	3 marks
Question no. 9		
Q9a	What is meant by crystallization? What are the various type's crystallizers available in industrially?	5 marks
Q9b	Describe a batch crystallizer with a neat diagram.	4 marks
Question no. 10	Write shot notes on	
Q1oa	Idlers	3 marks
Q10b	Rittnger'sLaw	3 marks
Q10c	Belt Conveyor	3 marks