

# END SEMESTER/ RE-TEST EXAMINATION, 2020

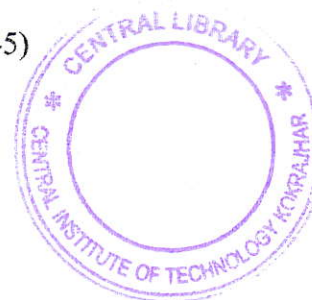
Semester: 5<sup>th</sup>

Subject code: FPT-502

FOOD ENGINEERING 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

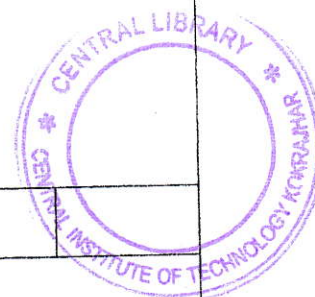
PART-A		
MARK-25		
Questions no.	questions	marks
Question 1	Fill in the blanks:	1x5=5
1a	In disc separator, the adjustable component for separation is _____.	
1b	Cyclone separators separates materials on the basis of _____.	
1c	Jaw crusher is of two types 1. Dodge type and 2 <sup>nd</sup> is _____.	
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	
Q10a	Idlers	3 marks
Q10b	Rittnger's Law	3 marks
Q10c	Belt Conveyor	3 marks

