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

| PART-A<br>MARK-25 | | |
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| 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 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 | |

| | | |
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| | 15 second. | |
| Question no. 3 | Choose the correct answer | 1x10=10 |
| Q 3a | Belt conveyor is used in | |
| | i. Material transportation over long distance<br>ii. Material transportation with in the premises<br>iii. Both a & b<br>iv. Lifting of materials | |
| 3b | HTST pasteurization means | |
| | i) High temperature simple tank<br>ii) High time short temperature<br>iii) High temperature short time<br>iv) High time small temperature | |
| 3c | The hammer mill is used to reduce the size by | |
| | i. Shear<br>ii. Impact<br>iii. Cutting<br>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<br>ii. Compression<br>iii. Cutting<br>iv. Crushing | |
| 3e | The size of the agricultural products may be reduced by | |
| | i. Shear<br>ii. Impact<br>iii. Crushing an compression<br>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<br>ii. Impact<br>iii. Cutting<br>iv. Crushing | |
| 3g | The process of heat treatment in which partial cooking of product takes place to inactivates and destroys the enzymes | |
| | i. Blanching<br>ii. Cooking<br>iii. Deep-fat frying<br>iv. Roasting | |
| 3h | Transpiration of powder materials inside the plant is takes place | |

| | | |
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| | using | |
| | i. Bucket elevator<br>ii. Belt conveyors<br>iii. Pneumatic conveyors<br>iv. None of the above | |
| 3i | Law of grinding which is more applicable for fine grinding is | |
| | i. Bond'S Law<br>ii. Kick'S law<br>iii. Rittinzer'S Law<br>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<br>ii. Compression<br>iii. Crushing<br>iv. Cutting | |



| PART-B<br>MARK- 45 Marks ( 9x5 marks) | | |
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| 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 | |

| | | |
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| 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 |