

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: FT204

Course Name: ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any three full questions, each question carries 10 marks.

Marks

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|---|---|------|
| 1 | Recall the measurement techniques of porosity. | (10) |
| 2 | a) Discuss "Knowledge of surface area of plant materials is important to plant scientist." Also explain the method to measure leaf and stalk. | (5) |
| | b) Compare and discuss mercury porosimetry and gas absorption. | (5) |
| 3 | Derive the mathematical equation for calculating terminal velocity and drag coefficient. | (10) |
| 4 | Derive Gibbs Absorption equation. | (10) |

PART B

Answer any three full questions, each question carries 10 marks.

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| 5 | Derive Janssen and Rankine's equation of pressure distribution in storage structures and compression chambers. | (10) |
| 6 | a) Discuss how moisture content and angle of repose are connected. | (5) |
| | b) Discuss the role of angle of internal friction and angle of repose in the designing of storage bins. | (5) |
| 7 | a) Discuss the economic importance of mechanical damage in seeds and grains, fruits and vegetables. | (5) |
| | b) Describe the four phases of impact damage. | (5) |
| 8 | How vibrational damage affect the agricultural products and explain the laboratory setup used to measure vibrational damage. | (10) |

PART C

Answer any four full questions, each question carries 10 marks.

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| 9 | Explain Physical States of matter using creep compliance function and relaxation modulus function. | (10) |
| 10 | Explain the following term; | (10) |
| | a. Yield point | |
| | b. Shear strength | |
| | c. Poisson's point | |
| | d. Modulus of elasticity | |

e. Shear strain

- 11 Differentiate uniaxial compression and uniaxial tension. (10)
- 12 Explain why firmness and hardness is considered as a major factor in rheological properties. (10)
- 13 Elucidate three methods for sensory evaluation of food. (10)
- 14 Mention any three instruments used in the food texture analysis. (10)
