

Ph.D in DAIRY SCIENCE AND TECHNOLOGY

Term-End Examination

December, 2014

**RDR-003 : PRODUCT MONITORING AND
PROCESS CONTROL**

Time : 3 hours

Maximum Marks : 100

Note : Attempt any five questions. All questions carry equal marks.

1. What is a food process control loop ? Describe its different elements and explain how a feedback control model works ? 20
2. Detail the various steps involved in Product - Process monitoring aimed at product quality optimization. 20
3. (a) What do you understand by 'flavour bioassay' ? Explain how Charm Analysis is carried out ? 12
(b) How is a mass spectrophotometer be used as a GC detector ? 8
4. (a) What are major types of biosensors ? Describe the construction, functioning and application of an enzyme based sensor. 12
(b) What are chiral compounds ? How are these analyzed in food ? 8

5. (a) Give the principle and procedure for quantification of heavy metals by Atomic Absorption Spectrophotometer. 12
(b) How does bitterness arise in dairy products ? 8
6. (a) Explain the principle and applications of 'X-ray diffraction' and 'Ultra - sound' techniques in food industry. 12
(b) Explain polarized light microscopy and its application in food characterization. 8
7. Write short notes on **any four** of the following : 20
(a) Working principle of HPLC
(b) E - nose
(c) IR spectrophotometer sample cells
(d) Automatic milk analyzers
(e) Piezoelectric transducers.
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