

Code: 9A23303

R09

B.Tech II Year I Semester (R09) Supplementary Examinations December 2015

FLUID FLOW IN BIOPROCESSES

(Biotechnology)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Write short notes on the following:
 - (a) Heat transfer in bioprocess.
 - (b) Unit operations.
- 2 Write an account on units & dimensions and conversion of units.
- 3
 - (a) Give an account on Bernoulli's equation and its significance.
 - (b) Give a brief account on properties of fluids.
- 4 Write notes on the following:
 - (a) Concept of Newtonian and non-Newtonian fluids.
 - (b) Newton's law of viscosity.
- 5 Discuss about Hagen-Poiseuille equation and its significance.
- 6 Write an account on the following:
 - (a) Concept of packed beds.
 - (b) Terminal velocity.
- 7 Explain about the flow measuring and monitoring systems.
- 8 Give an account on the following:
 - (a) Positive displacement pumps.
 - (b) Diaphragm pumps.
