

R09

Code No: 09A32303

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech II Year I Semester Examinations, May/June-2013

Process Engineering Principles

(Biotechnology)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Explain the role of bioprocess engineer in biotechnology industry, explain with the help of suitable examples.
- b) Describe the applications of transport phenomenon principles in bio processing. [15]
2. Explain dimensional analysis? And different methods of dimensional analysis. [15]
3. Derive Bernoulli's equation and its applications. [15]
- 4.a) What is Newton's law of viscosity? Give the classification of fluids with a neat figure.
- b) Describe plate and cone viscometer. [15]
- 5.a) Write about Boundary layer concept.
- b) Derive Hagen-Poiseuille equation. [15]
6. Explain the concept of fluidization, and derive an expression for pressure drop in fluidized bed. [15]
- 7.a) Explain the different types of flow measuring devices.
- b) Write short notes on 'valves' and 'bends'. [15]
8. Explain the following.
 - a) Positive displacement pumps
 - b) Reciprocating pumps.
 - c) Diaphragm pumps.
 - d) Peristaltic pumps. [15]

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