

R07

Code: R7102306

B. Tech I Year (R07) Supplementary Examinations, June 2013

PROCESS ENGINEERING PRINCIPLES

(Biotechnology)

Time: 3 hours

Max. Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain the development of boundary layer on a flat plate.
(b) Distinguish between laminar and turbulent flow.
- 2 (a) What is the difference between the two types of forces using kgwt and Newton?
(b) What is the difference between C_p and C_v of gases? How they are related?
- 3 (a) Enumerate Newton's law of viscosity giving a neat sketch.
(b) With the help of a neat sketch describe a simple inclined manometer.
- 4 (a) State the differences between Newton and non-Newton fluids with relevant examples in bioprocessing.
(b) Explain about coaxial cylinder viscometer.
- 5 (a) Draw a neat sketch of peristaltic pump and explain its construction.
(b) Explain about working principle of peristaltic pump.
- 6 A gas tight room has a volume 1000 m^3 . The room contains air considered to be 21% O_2 and 79% N_2 (by mole) at 20°C and a total pressure of 1 atm.
(a) What is the partial volume of O_2 in the room?
(b) What is the partial volume of N_2 in the room?
(c) What is the partial pressure of O_2 and N_2 in the room?
- 7 (a) With a neat diagram explain about rotameter.
(b) Differentiate between orifice meter and venturimeter.
- 8 (a) Derive the equation for the terminal setting velocity for a spherical particle in the Stoke's law region under free setting conditions range.
(b) Explain the stuffing box and mechanical seal.
