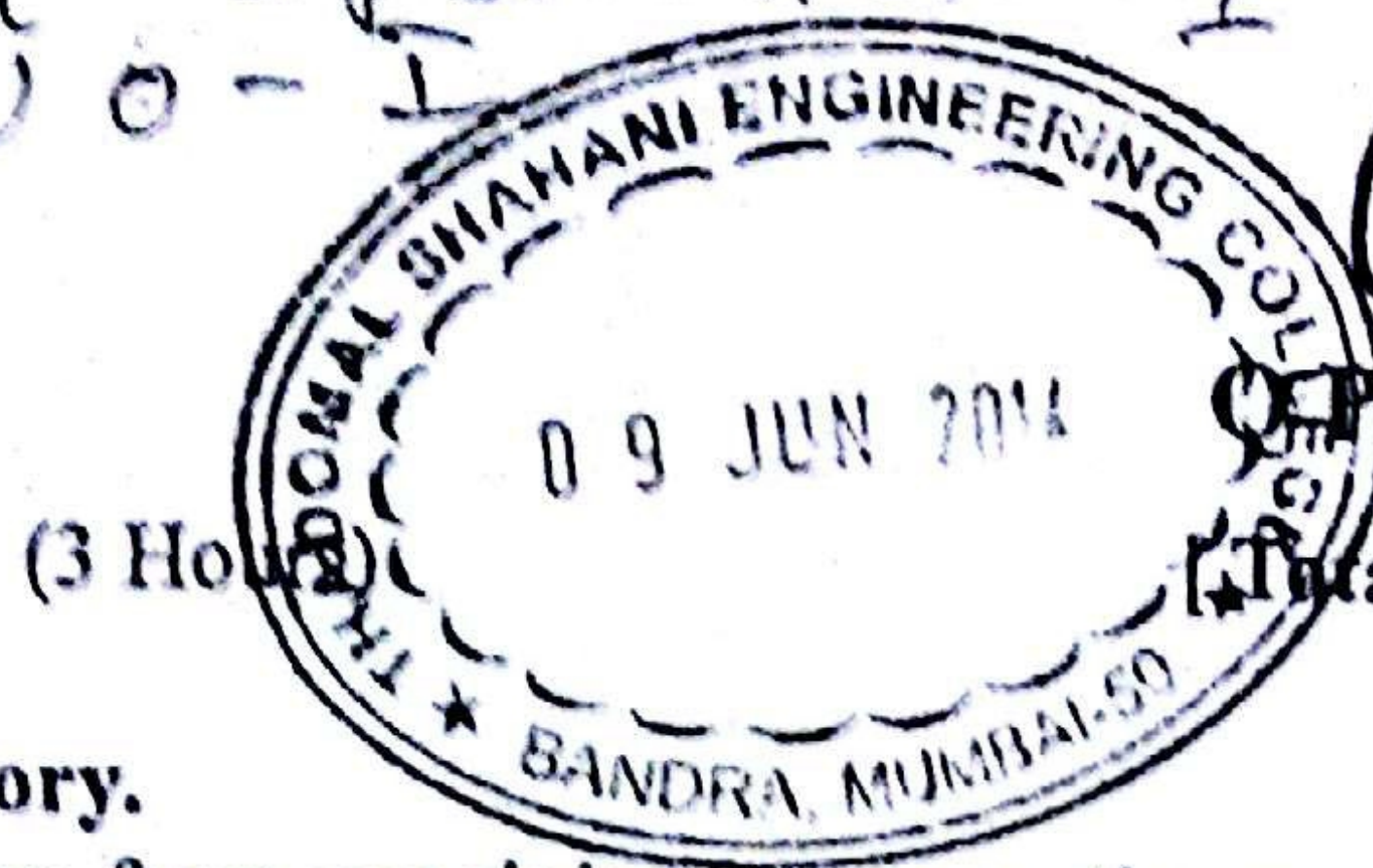


SE (Biotech) - III (CBGS)
Unit Operation - I

09/7/14



Code : NP-18773

Total Marks : 80

- N.B. : (1) Question No.1 is compulsory.
(2) Attempt any three questions from remaining five questions.
(3) Assume suitable data wherever necessary.

1. Answer the following (any four) 20
- (a) Explain capacity and effectiveness of screen.
 - (b) Apply the principle of conservation of mass to the flow of incompressible fluid to derive the relevant form of continuity equation.
 - (c) Give various temperature measuring devices.
 - (d) State Bond's law for size reduction and give its equation.
 - (e) Give the important factors on which rate of filtration depend.
2. (a) Water is flowing through a pipe having diameter 30cm and 15cm at the bottom and upper portion respectively. The intensity of pressure at the bottom end is 29.43 N/cm² and the pressure at upper end is 14.715 N/cm². Determine the difference in datum head if the rate of flow through pipe is 50 lit/sec. 10
- (b) Describe the principle, construction, working and applications of venturimeter. 10
3. (a) Differentiate between crushing and grinding. 6
- (b) Calculate the operating speed of the ball mill from following data 8
- (i) Diameter of ball mill = 500 mm
 - (ii) Diameter of ball = 50 mm
- Operating speed of ball mill is 35% of critical speed.
- (c) Compare ideal screen and actual screen. 6
4. (a) Give the classification of pump? Explain construction and working of centrifugal pump. 10
- (b) Explain pneumatic conveyor with neat diagram. 5
- (c) Explain Helical blade mixers. 5
5. (a) Explain constant rate and constant pressure filtration. 10
- (b) State Newton's law of viscosity? What is kinematic viscosity? Find the kinematic viscosity of an oil having density 960kg/m³. The shear stress at a point in oil is 0.25 N/m² and velocity gradient at that point is 0.25s⁻¹. 10
6. Write short notes on :(any four) 20
- (a) Piezometer
 - (b) Blowers
 - (c) Knife Cutter
 - (d) Pitot Tube
 - (e) Orifice Meter.