

BP. 3<sup>rd</sup> Sem. (ASTV) - 04/12/15

Total No. of printed pages = 4

PY 132303

Roll No. of candidate

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2015

**B. Pharm 3rd Semester End-Term Examination**

**BASIC ENGINEERING - I**

**(Unit Operations - I)**

Full Marks-100 Pass Marks-35 Time-Three hours

The figures in the margin indicate full marks  
for the questions.

1. Answer any *ten* questions : 10×3=30
  - (a) Differentiate between fluid statics and fluid dynamics. Mention the applications of fluid flow in pharmaceuticals.
  - (b) Define pressure head. List the different heads in the Bernoulli's theorem.
  - (c) Give Reynolds number and explain the symbols used therein.
  - (d) What is meant by 'air binding' in pumps ? How do you overcome the problem ?

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- (e) Draw a humidity chart and give its significance.
- (f) What are the applications of air conditioning?
- (g) Explain the principle of dehumidification.
- (h) List the properties of filter aids. Mention the handling of filter aids.
- (i) Discuss the mechanisms of filtration. Write the Poiseuille's equation.
- (j) Write the characteristics of filter media. Write a note on materials of filter media.
- (k) Define crystallization. Write the applications of crystallization.
- (l) Describe steel as materials of plant construction.

2. Answer any *eight* questions :  $8 \times 5 = 40$

- (a) Define reciprocating pump. Discuss the theory and nature of discharge of reciprocating pump.
- (b) What is vena contracta? Write the construction and working of orifice meter.
- (c) What is fluidized state? Describe the principle of pneumatic conveyor with a labeled diagram.

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- (d) Discuss factors affecting and prevention of caking.
- (e) Describe the construction and working of a rotary continuous filter.
- (f) Define centrifugal effect and describe the theory of centrifugation. Mention the applications of centrifugation in pharmaceuticals.
- (g) Classify materials of pharmaceutical plant construction. Write a note on the utility of glass in pharmaceutical industry.
- (h) What are possible industrial hazards? What methods are employed for preventing the hazards of handling and use of poisonous chemicals in industry?
- (i) Classify manometers. Discuss two-fluid U-tube manometer with a labeled diagram.
- (j) What are primary refrigerants? Describe the working of a refrigerator.

3. Answer any *three* questions :  $10 \times 3 = 30$

- (a) Discuss the Mier's super-saturation theory of crystallization. What are the limitations of the Mier's theory? Write a note on Krystal crystallizer.

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- (b) (i) Write Bernoulli's equation and explain the symbols used therein with a labeled diagram. 5
- (ii) Explain the energy losses that occur when a fluid flows through a pipe with relevant equations. 5
- (c) Discuss the objectives and advantages of conveying. Describe the construction and working of belt conveyor system for solid transport. 4+6=10
- (d) Water is flowing through a 1.0 cm I.D pipe at an average velocity of 10 cm/sec. Calculate
- (i) Reynolds number
- (ii) Friction factor
- (iii) Pressure drop required to pump water through a 10 meter long pipe. Density of water = 1g/cc, Viscosity of water = 1 cp. 3+3+4=10

