Q. P. Code:-18304

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Question **No. 1** is compulsory.
2. Attempt any **three** questions out of remaining 5 questions.
3. Figures to right indicates full marks.
4. Assume suitable data wherever necessary.

Q.1 Answer the following. **(Any four)**

a. What are the factors that influence the size of product in ball mill? 5
b. Comment on: "Particle size analysis is essential." 5
c. State and derive Pascal's Law. 5
d. What is cavitation and priming in a centrifugal pump? 5
e. Explain Reynold's experiment used for studying nature of flow. 5

Q. 2 a. What is a pitot tube? Derive the equation for velocity of flow in a pipe by pitot-tube. 10
b. What are the different flow patterns in mixing and how are they obtained? 10

Q.3 a. State different types of pumps used for pumping of fluids. Explain construction and working of centrifugal pump. 10
b. Explain the various major and minor losses in the pipes with empirical formula. 5
c. Explain construction and working of Bourdon Gauge. 5

Q. 4 a. Write down the general form of Bernoulli equation. Explain the significance of each term. What is importance of Bernoulli's equation from application point of view? 10
b. The rate of flow of water through a horizontal pipe is 0.9 m^3/s. The diameter of pipe is suddenly converged from 750 mm to 500 mm. The pressure intensity in the large pipe is 13.734 N/cm^2. Determine (i) loss of head due to sudden change in diameter and (ii) pressure intensity in smaller pipe. 10

Q. 5 a. Develop expressions for local velocity, maximum velocity and average velocity for flow of Newtonian fluid in laminar flow through circular pipe. 10
b. The water is flowing through a pipe having diameters 20 cm and 10 cm at sections 1 and 2 respectively. The rate of flow through pipe is 35 liters/s. The section 1 is 6 m above datum and section 2 is 4 m above datum. If the pressure at section 1 is 39.24 N/cm^2, find the intensity of pressure at section 2. (Density of water = 1000 kg/m^3). 10

Q.6 **Write a note on any four**

a. Types of conveyors 5
b. Differentiate between: Ideal screen and actual screen. 5
c. Jaw crusher 5
d. Effect of temperature and pressure on viscosity of fluids 5
e. Batch sedimentation 5

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