# BHARATI VIDYAPEETH INSTITUTE OF TECHNOLOGY
# Question Bank (K-Scheme)

**Name of subject: Hydraulics** **Unit Test: II**
**Subject code: 314303** **Course: CE**
**Semester: IV**

## Unit 3 (Hydrokinematics and Hydrodynamics)

**2 Marks**

1. Explain Continuity Equation for liquid flow.
2. Define Pressure head and give its unit.
3. Explain Energy of flowing liquid.
4. Define Uniform flow and Non Uniform flow.
5. State Bernouli's theorem and its applications.

**4 Marks**

1. While performing the experiment of Reynolds number , a batch of students observed actual discharge of $4.4 \times 10^{-6}$ $m^3/s$ from a pipe of 2.5 cm dia. The dynamic viscosity (μ) at room temperature 25° C was $0.824 \times 10^{-3}$ N-sec/$m^2$. Identify the flow observed and draw the sketch of it..
2. State the Bernoulli's theorem and write the mathematical expression for it.
3. Explain Continuity Equation for liquid flow.
4. Differentiate between Laminar flow and Turbulent flow.
5. Water is flowing upward through a vertical pipe line 15m height is gradually tapers from 200mm diameter at bottom to 100mm at top and 300KPa pressure ,2m/s velocity at bottom. Calculate the pressure at top of pipeline.if loss of head is 4.5m of water.

## Unit 4 (Flow Through Pipes and Pumps)

**2 Marks**

1. Enlist different types of losses.
2. Give the formula for a) Loss of head due to Sudden Enlargement b) Loss of head due to sudden contraction
3. Enlist types of Orifice
4. Give the formula of different coefficient of an Orifice.
5. Give the formula for a) Loss of head at entrance of pipe b) Loss of head at exit

**4 Marks**

1. A venturimeter fitted in a pipe of diameter 30cm and has a throat diameter 10cm. If the manometer reading is 6cm,find discharge through pipe.Take Cd=0.98
2. A 10cm diameter pipe suddenly enlarge to 20cm diameter. Calculate discharge through pipe,if loss of head due to sudden enlargement is 30cm of water.
3. Find the diameter of uniform pipe to replace a compound pipeline having 50cm diameter pipe for 1500m length,40cm diameter pipe for 1000m length and 35cm diameter for 1000m length.The total length of uniform pipe should remain the same.
4. Water discharges at the rate of 0.0982 m^3/s through 12cm diameter vertical sharp edged orifice placed under a constant head of 10m. Apoint on the jet measured from vena contracta of the jet has co-ordinates 4.5m horizontal and 0.54m vertical.Find the coefficients of the orifice.
5. A centrifugal pump is required to lift the water to a total head of 30m at the rate of 60lit/sec.If power required is found to be 22KW,determine the overall efficiency of the pump.

## Unit 5 (Flow Through Open Channels)

**2 Marks Questions**

1. Define a) Wetted Area b) Hydraulic Radius
2. Write Mannings formula.
3. Difference between open channel and pipe flow.
4. Give the formula for discharge through Rectangular and Triangular notch.

**4 Marks**

1. Trapezoidal most economical channel section has sides slopes 1.5H:1V. It is required to discharge 20m^3/s with a bed slope of 1m in 6KM. Design the section using mannings formula.Take N=0.015
2. Determine the bottom with and depth of flow for most economical section of rectangular channel to carry a discharge of 3Cumec. The cheezy's constant C=60 and bed slope 1:1000.
3. A triangular notch of angle 120 is used to measure the discharge of pump. Determine the head over the notch,if discharge is 1200lit/min.Assume Cd=0.6.

4. A trapezoidal channel has side slope 1.5H to 1V and bed slope 1 in 4000.Find the dimensions of the most economical section of the channel,if it has to pass a discharge of 15m^3/sec. Assume N=0.012

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