

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME Semester –III Examination Dec. - 2011**

**Subject code: 731201**

**Date: 05/12/2011**

**Subject Name: Water Supply & Drainage**

**Time: 10.30 am – 01.00 pm**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) How will you arrive at the treatment plant capacity for a proposed water treatment plant of a town? **07**
- (b) Draw the layout plan and section of a typical surface water treatment plant. **07**

- Q.2** (a) Write short note on elevated service reservoir. **07**
- (b) How will you decide the capacity of the pump for lifting water? **07**

**OR**

- (b) Describe “fire hydrants”. **07**

- Q.3** (a) Describe Hardy cross method for analysis of pipe networks. **07**
- (b) Write short note on centrifugal pumps. **07**

**OR**

- Q.3** (a) Discuss briefly the rational method to determine the flow of storm water. **07**
- (b) The following data is available regarding the various types of area and the corresponding impermeability factors (C). If the maximum intensity of rainfall is 40mm/hour, calculate the discharge of storm water which will reach the sewer line. Use rational formula. **07**

Types of Surface	% area	Run off co-efficient
Roofs	35	0.9
Pavement & Yards	20	0.85
Lawn & Gardens	30	0.15
Vacant Plots	15	0.10

- Q.4** (a) Are storm sewer designed for full flow conditions? Why? Discuss in details. **07**

- (b) Calculate the velocity of flow and discharge in storm sewer of circular section having diameter of 1.5 m laid at a gradient of 1 in 450. Assume sewer is running half full. **07**

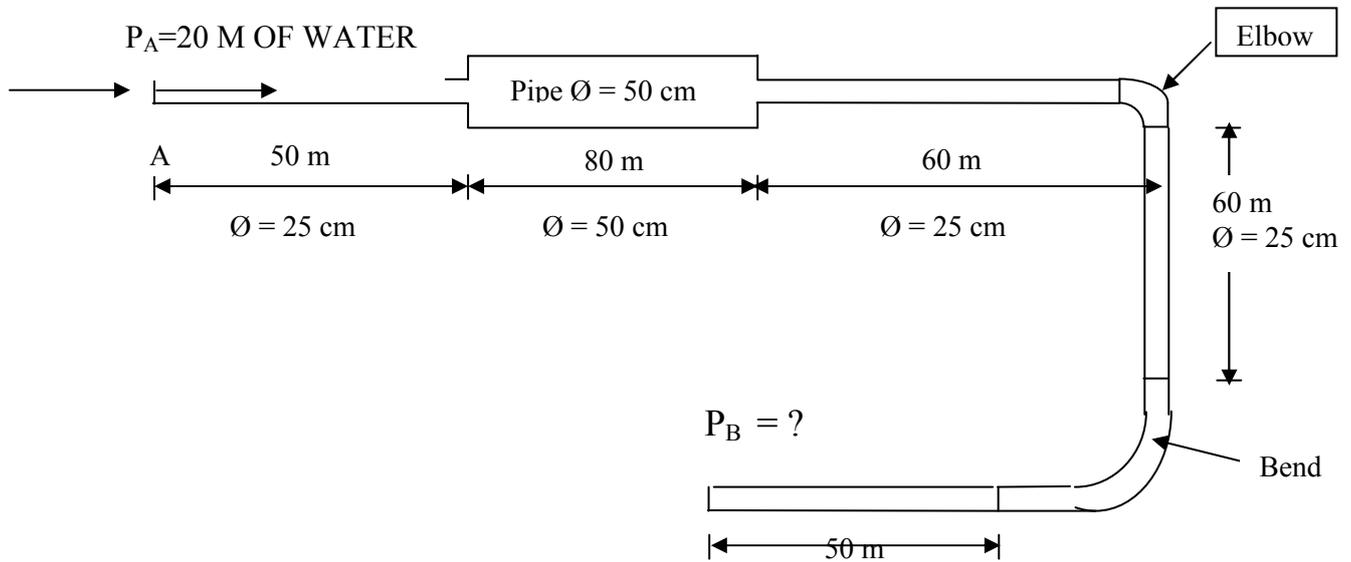
**OR**

- Q.4** (a) Explain the following: **07**
- (i) Non silting velocity
- (ii) Non scouring velocity

- (b) Determine the diameter of a storm sewer to carry storm discharge of  $0.75 \text{ m}^3/\text{sec}$ . The sewer is to be designed to run half full. **07**

- Q.5 (a)** State the head losses in the following fixtures: **07**
- (i) Bend
  - (ii) Gate valve
  - (iii) Elbow
  - (iv) Reducers
  - (v) Sudden expansion
  - (vi) Sudden contraction
- (b)** Explain how you will find out pressure at point B in following diagram. **07**

Plan of the Pipe Line



**OR**

- Q.5 (a)** Explain the following terms **07**
- (i) Hydraulic jump
  - (ii) Specific energy & specific energy curves
  - (iii) Froude's number and its usefulness.
- (b)** A trapezoidal channel having side slopes of 2 vertical to 1 horizontal has **07**  
 base width of 1.8 m carries water at a depth of 1.2 m. If the slope of  
 channel is 1 in 300. Find out discharge carried by the channel.

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