

Answer all the following questions:

(Hazen-Williams formula or chart is accepted and any missing data can be assumed)

Question 1 (30 marks)

- a) What are the types of pipes used in water distribution systems?.....[5]
 b) Given the network shown in Fig. 1, the inflow at A, and outflows at C, D and E. Using Hardy Cross method, find the flows in the individual pipes comprising the network (only one trial is required).....[25]

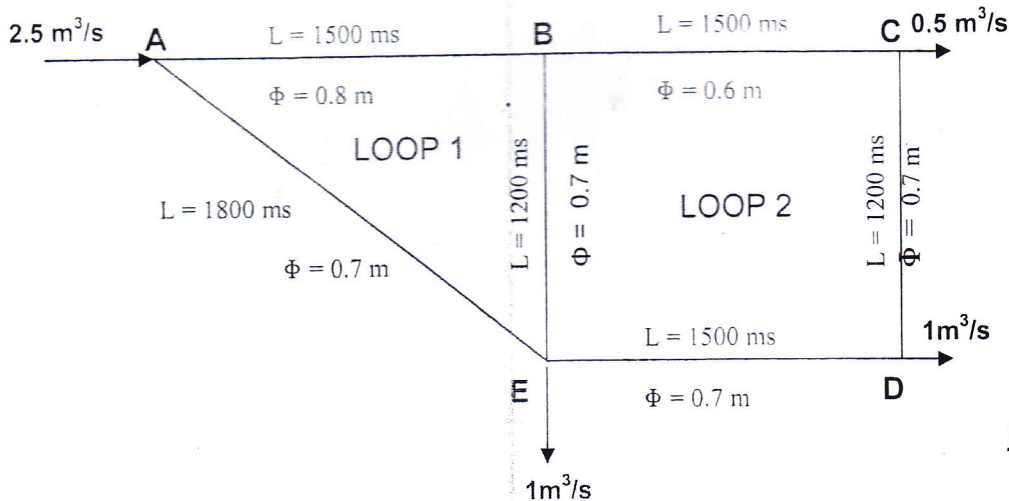


Fig. 1

Question 2 (25 marks)

- a) Discuss the purpose of using equivalent pipe?.....[5]
 b) For the system shown in fig.(2), when the flow from the elevated tank at A is 120 lit/sec, the pressure at D was 2.5 kg/cm². The flow to D must be increased to 165 lit/sec with a pressure at D equals to 3.5 kg/cm². What size of pipe, 1500 ms long, should be laid from B to D (shown dotted) parallel to the existing 250 mm to accomplish this result?[20]

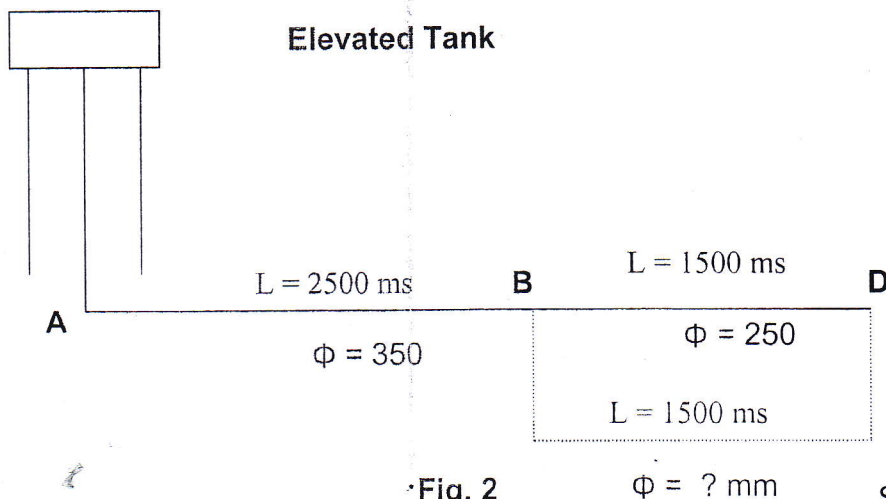


Fig. 2

See next page.....

Question 3 (25 marks)

Investigate the minor pipes of the distribution system shown in Fig. 3. The required fire flow 400 lit/sec. Feeders are 1000 ms apart and the normal pressure in the feeders is 2.8 kg/cm².

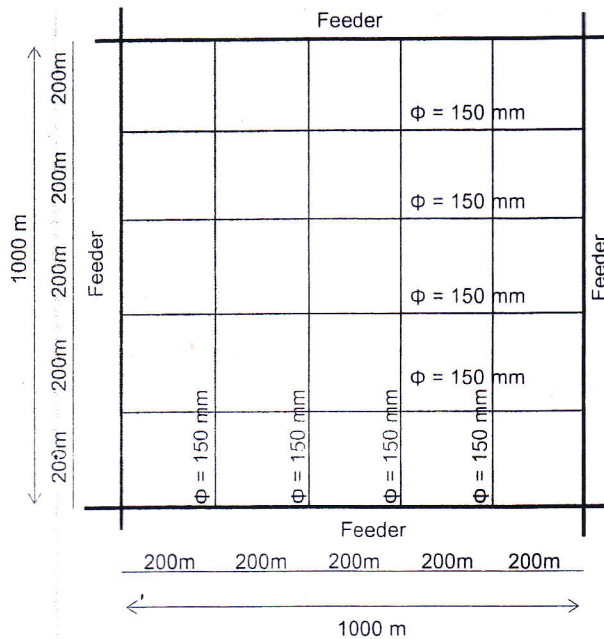


Fig. 3

Question 4 (20 marks)

- a) Compare (using sketches as possible) between different types of surface water intakes.....[10]
- b) An artesian well is pumped at the rate of 1.6 m³/min. At observation wells 150m and 300m away, the drawdowns noted are 0.75m and 0.60m, respectively. The average thickness of the aquifer at the observation wells is 6.0m. Compute the coefficient of permeability of the aquifer.....[10]

End of Exam - Good luck

This exam measures the following ILOs															
Question Number	Q1-a	Q1-b	Q2-a	Q3	Q4-a	Q1-b	Q2-b	Q3	Q4-b		Q1-b	Q2-b	Q3	Q4-b	
	a1-1	a1-2	a1-1	a1-2	a1-2	b2-1	b2-1	b2-1	b2-1		c1-1	c1-1	c1-1	c1-1	
Skills	Knowledge & Understanding Skills					Intellectual Skills					Professional Skills				