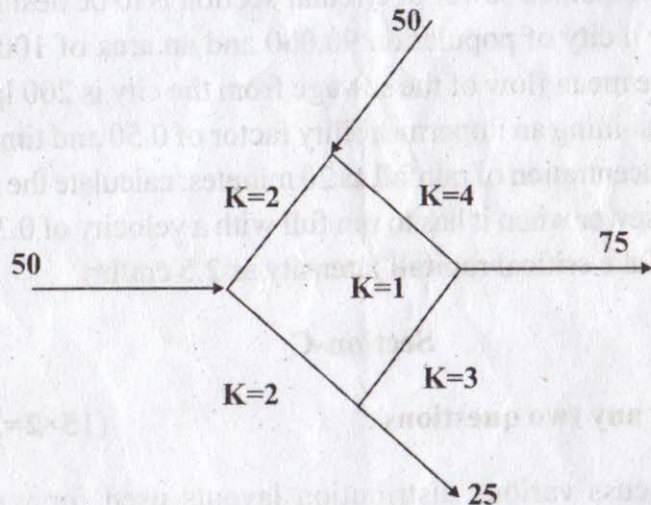


12. Write a short note on Hardy-Cross method used for analysis of complex pipe networks mentioning the conditions to be satisfied in any loop. Determine the distribution of flow in pipe network shown in Fig. The head loss, h , may be assumed as KQ . The flow is turbulent and pipe are rough. The value of K for each pipe is indicated in the fig. Use Hardy-Cross method.



(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 100513

Roll No.

B.Tech.

(SEM. V) THEORY EXAMINATION, 2015-16

ENVIRONMENTAL ENGINEERING-I

[Time:3 hours]

[Total Marks:100]

Section-A

- 1 Attempt all the parts. (2×4=20)
- What is the function of check valve?
 - As per Indian Standard conditions, what is per capita requirement of water taken for design purpose?
 - What is permissible limit of flourides in drinking water?
 - What is self-cleansing velocity?
 - Pumps are connected to be in to double the head and keep the discharge same.
 - What are the causes of permanent hardness?
 - What percentage of total water demand contributes to domestic use in pipes?

- (h) What are the characteristics of the simple reciprocating pumps?
- (i) What is permissible limit of iron in drinking water?
- (j) The regular population growth curve follows which curve equation?

Section-B

Attempt any five questions : (10×5=50)

2. Write a short note on laying of sewer pipelines.
3. Write a short note on various types of valves used in water supply pipelines.
4. Explain the various factors affecting consumption of water.
5. Define air pollution. Also differentiate between primary and secondary sources of air pollution.
6. Determine the future population of a town by geometric increase method for the year 2011 using the following data.

Year	Population
1951	93
1961	111
1971	132
1981	161

7. A circular sewer of 45 cm diameter is designed for a town of population 30,000. The sewer is designed to carry 3.5 times of DWF. What slope should be provided to the sewer when it is running full? Take Manning's $n=0.012$. Assume the relevant data suitably.
8. What are intakes? Enumerate various factors affecting selection of site of intakes.
9. A combined sewer of circular section is to be designed for a city of population 90,000 and an area of 100 ha. The mean flow of the sewage from the city is 200 lpcd. Assuming an impermeability factor of 0.50 and time of concentration of rainfall as 20 minutes; calculate the size of sewer when it has to run full with a velocity of 0.3 m/s. Take critical rainfall intensity as 2.5 cm/hr.

Section-C

Attempt any two questions : (15×2=30)

10. Discuss various distribution layouts used for water supply schemes.
11. Discuss various appurtenances used in sewer pipelines in detail.