

2017

**IRRIGATION ENGINEERING**

Paper : CE 716

Full Marks : 100

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

Answer **any five** questions.

1. (a) Define cross drainage work. Write a note on selection of suitable type of cross drainage work. With a neat sketch distinguish between siphon aqueduct and canal siphon. 15
- (b) Describe causes and effects of water logging. 5
2. (a) Explain with the help of a diagram, the various component parts of diversion head work. 15

Contd.

- (b) Explain the design procedure of a canal based on Lacey's theory. 5

3. (a) Fig. 1 shows the section of a hydraulic structure founded on sand. Calculate the average hydraulic gradient. Also, find the uplift pressure at point 6, 12, 18m from the U/S end of the floor and find the thickness of the floor at those points. 10

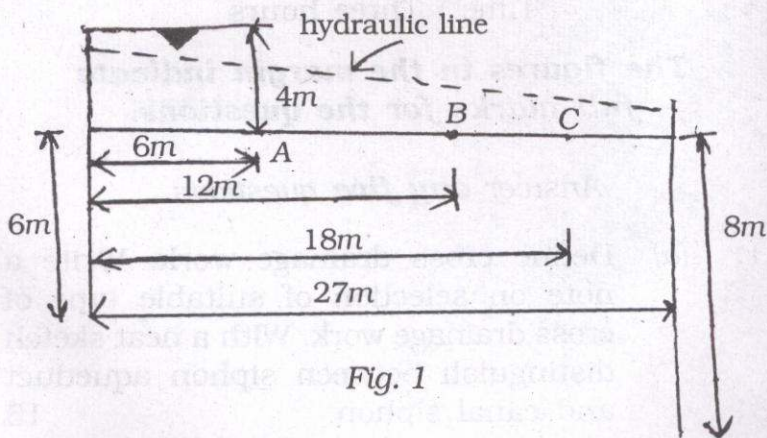


Fig. 1

- (b) Design a channel section by Kennedy's theory from the following given data :  
 Discharge = 2828 cumecs  
 Kutter's  $N = 0.0225$   
 $C.V.R./m = 1$ , side slope =  $1/2 : 1$   
 $B/D = 7.6$ , find also the bed slope of channel. 10

4. (a) Explain the procedure of designing Sarda type fall. 15
- (b) What is Canal Lining? What are its advantages? 5
5. (a) Design a trapezoidal shaped concrete lined channel to carry a discharge of 100 cumecs at a slope of 25cm/km. The side slope of the channel are 1.5:1. The value of  $N$  may be taken as 0.016. Assume the limiting velocity as 1.5m/sec. 10
- (b) Compare Kennedy's and Lacey's silt theories. Why is Lacey's conception superior to that of Kennedy's? 10
6. (a) Enumerate various types of lining used for canal. 10
- (b) Explain briefly the various types of canal fall. Why is it necessary? 10