Roll No. ..... **Total Pages : 2**

BT-7/M-21 47045

IRRIGATION ENGINEERING

Paper–CE-403 E

Time allowed : 3 Hours **Maximum Marks : 100**

Note : Attempt **five** questions in all, selecting at least **one** question from each unit. All questions carry equal marks.

UNIT-I

1. Design a 1.5 meter Sarda Type Fall for a canal carrying discharge of 42 cumecs with the following data :
   Bed level upstream = 105.0 m,
   Bed level downstream = 103.5 m,
   Side slope of channel = 1 : 1,
   Full supply level upsteam = 106.8,
   Full supply level downstream = 105.3 m,
   Berm level u/s = 107.4 m,
   Bed width u/s and d/s = 30 m,
   Safe exit gradient for Khosla's theory = 1/5. 20

2. (i) Discuss the procedure for design of a silt extractor. Also draw a neat sketch. 10
   (ii) Explain functions of cross regulator with neat diagram labeling each part. 10

UNIT-II

3. Design a Siphon aquaduct for the following data : 20
   Discharge of canal = 40 cumecs,
   Bed width of canal = 30m,
   Full supply depth of canal = 1.6 m,
   Bed level of canal = 206.4m,
   Side slopes of canal = 1.5 H : 1V,
   High flood discharge of drain = 450 cumecs,
   High flood level of drainage = 207.0 m,
   Bed level of drainage = 204.5 m,
   Ground level = 206.5 m.

4. Explain briefly salient features of Khosla's theory and how it is used in design of permeable foundations? Numerate various corrections that are needed in this theory. 20

UNIT-III

5. (i) What do you understand by an elementary profile of a Gravity Dam? What should be maximum depth of elementary profile of gravity if the safe limit of stress on masonry should not exceed 1500 kN per m^2. 10

   (ii) What are different galleries in a Gravity Dam? Discuss their functions with neat diagrams. 10

6. (i) Differentiate between Rock Toe and Chimney Drain with neat sketches used in Earthern Dam. 10

   (ii) Discuss seepage control measure to be taken in an Earthern Dam. 10

UNIT-IV

7. Design a suitable section for the overflow section (spillway) of a concrete gravity dam having a downstream face sloping at a slope of 0.7 H : 1 V. The design discharge for the spillway is 6500 cumecs. The height of spillway crest above river bed is 60 m. The effective length of spillway is 52m. 20

8. (i) Describe with neat sketches various types of bucket type energy dissipators used in spillways. 10

   (ii) What is priming? Discuss the priming arrangement used in a addle Siphon Spillway. 10