

6. (a) Differentiate between an arch dam and an earth dam. Derive an equation for the most economical angle of an arch dam. 10
(b) Discuss seepage control measures to be taken in an earthen dam. 10

Unit IV

7. Describe with neat sketch chute or trough spillway. Also discuss the various design considerations of a chute spillway. 20
8. (a) Enumerate different types of spillway gates. Describe the working of a Tainter gate with a neat diagram. 10
(b) Why are stilling basins provided in a spillway? Draw a neat sketch of any one of the IS type stilling basin and discuss its elements separately. 10

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IRRIGATION ENGG-II

CE-403-E

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. All questions carry equal marks. Assume any missing data. Use of Khosla's charts, Blench curves and Montague curves is permitted.

Unit I

1. (a) Draw a neat sketch of Montague type of fall along with its profile and show its components. 10
(b) What are roughening device? Discuss their different types along with use in falls construction. 10
2. Design a cross regulator for a channel (without uplift pressure calculation of floor) for the following data :
Discharge of parent channel = 140 cumecs,
Discharge of distributory = 15 cumecs, FSL of

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parent channel $u/s = 210.0$ m, FSL of parent channel $d/s = 209.8$ m, bed width of parent channel $u/s = 52$ m, bed width of parent channel $d/s = 46$ m, depth of water in parent channel u/s and $d/s = 2.5$ m, FSL of distributory = 209.1 m, silt factor = 0.8 , exit gradient = $1/5$. 20

Unit II

3. Design a suitable cross-drainage work with the following data : 20

Canal :

Full supply discharge = 354 cumecs

Bed width = 24 m

Full supply level = 207.60 m

Canal bed level = 201.4 m

Side slopes = $0.5 H : 1 V$

Natural Drainage :

High flood discharge = 600 cumecs

High flood level = 206.3 m

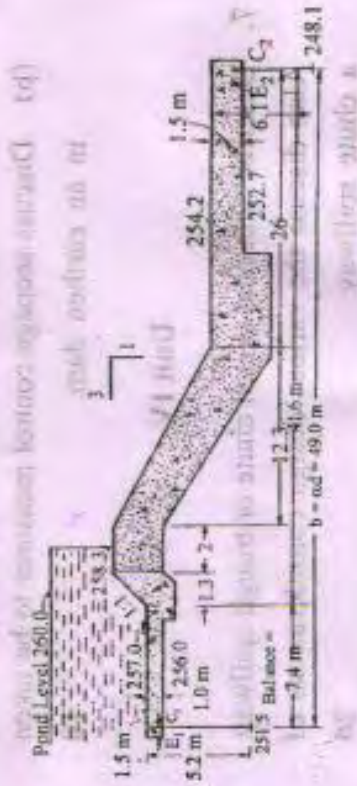
Drainage bed level = 203.6 m

4. Determine the corrected percentage pressures at key points of the sloping glacis as given below.

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Also determine the exit gradient and plot the HGL for pond level and no flow on downstream side by using Khosla's theory. 20



Unit III

5. (a) The base width of a concrete gravity dam is 75 m. For the full reservoir condition, the resultant passes through a point 12 m from the centre. The slope at the downstream face is 0.7 horizontal to 1 vertical. If the total vertical load is 6850×10^4 N; find the normal stress, shear stress and the principal stress at the toe. 10

(b) What are the various modes of failure of a gravity dam? Discuss each of them briefly. 10

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