

B.E. Civil VII CBSGS
Irrigation Engg

8-12-16
Q.P. Code : 848502

(3 Hours)

[Total Marks : 80

- N.B. :** (1) Question No 1 is compulsory.
 (2) Attempt any 3 questions out of the remaining.
 (3) Assume data wherever necessary and clearly mention the assumptions made.
 (4) Draw neat figures as required.

1. Solve any four from the following 20
- Discuss briefly the various techniques used for distributing water in the farms.
 - What is meant by "Flow duty" and "Quantity duty"? Describe briefly factors affecting duty.
 - What is Precipitation? Explain the various types of precipitation.
 - Differentiate between confined and unconfined aquifer with neat sketch.
 - Discuss the factors which are considered for the selection of site for a proposed dam.

2. 6
- Write a short note on irrigation efficiencies. 6
 - Explain recording type rain gauges with neat sketches. 8
 - Determine the reservoir capacity for :
 Command area of 40,000 ha, canal losses = 10% and reservoir losses = 10%
 Base period, outlet factor and intensity of irrigation are as under:

Crop	Base Period (days)	Outlet factor(ha/cumecs)	Irrigation intensity (%)
Sugarcane	360	1700	20
Cotton	180	1500	10
Wheat	120	1800	20
Rice	120	700	15
Vegetables	120	700	15

3. 8
- What do you understand by Catchment area and Runoff? Explain the various factors that influence the runoff from a catchment area. 8
 - The following are the ordinates of 12 hour unit hydrograph. 8

Time (hr)	0	12	24	36	48	60	72	84
Flow (10 ² cumecs)	0	16	29	26	14	7	1.5	0

If successive 12 hour rainfall excesses are 1.5 cm, 3.0 cm and 0.75 cm for the catchment, plot the resulting flood hydrograph on a graph sheet and mark the lag time and flow expected for the river.

[TURN OVER]

- c) Define "Storage coefficient" and "Transmissibility". 4

- 4. a) Write a short note on Reservoir Sedimentation and Explain the methods to control it. 6
- b) Explain the various forces acting on gravity dam with neat sketches. 6
- c) A 60 cm diameter well is being pumped at a rate of 1360 lit/minute. Measurements in the nearby test well were made at the same time as follows: At a distance of 6 m from the well being pumped, the drawdown was 6 m and at 15 m the drawdown was 1.5 m. The bottom of the well is 90 m below the ground water table. (a) Find out the coefficient of permeability. (b) If all the observed points were on the dupuit's curve, what was the drawdown in the well during pumping? (c) what is the rate at which water can be drawn from this well. 8

- 5. a) What are the causes of failure of Earthen Dam? Explain in detail with neat sketches. 10
- b) A concrete gravity dam has maximum water level 305.0 m, bed level 225.0m, top R.L. of dam 309.0 m, d/s face slope starts at R.L 300.0 m, d/s slope 2:3, tail water is nil, upstream face of dam is vertical, center line of drainage gallery is 8 m d/s of u/s face, uplift pressure is 100% at the heel, 50 % at the line of gallery and zero at toe, weight of concrete is 2.4 t/m³. Considering only weight, water pressure and uplift, determine (i) Maximum vertical stresses at toe and heel of the dam, (ii) Major principal stresses at the toe of dam, and (iii) Intensity of shear stress on a horizontal plane near the toe. 10

- 6. Write a short note on following :- 20
 - a) Arch and Buttress Dam
 - b) Cross Drainage works
 - c) Canal Regulation works
 - d) Canal Lining and Water Logging

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