

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH. I SEMESTER REGULAR EXAMINATIONS
WATER RESOURCES ENGINEERING I
(CIVIL ENGINEERING)

NOVEMBER -2005

TIME: 3 HOURS
MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Distinguish between:
 - i. Wild flooding and controlled flooding.
 - ii. Free flooding and basing flooding
 - iii. Sprinkler irrigation and drip irrigation.(b) Explain different methods of controlled flooding with the help of neat sketches.
2. (a) Name the principal Indian crops and detail their water requirements. Also suggest ways to increase the duty in an irrigation system.
(b) During a particular stage of the growth of a crop, consumptive use of water is 2.8 mm/day. Determine the interval in days between irrigations and depth of water to be applied when the amount of water available in the soil is 25%, 50%, 75% and 0% of the maximum depth of available water in the root zone which is 80 mm. Assume irrigation efficiency to be 65%.
3. (a) Hydrology is a highly interdisciplinary science. Justify.
(b) Describe the hydrologic cycle with a neat sketch.
4. What are the various components of runoff? Describe how each component is derived in the runoff process.
5. (a) Distinguish between:
 - i. Vadose zone and phreatic zone
 - ii. Aquiclude and Aquitard
 - iii. Transmissivity and storativity(b) An unconfined aquifer has an areal extent of 15 km². When 9.5 million cubic metres of water was pumped out, the water table was observed to go down by 2.4 m. What is the specific yield of the aquifer? If the water table of the same aquifer rises by 12.5 m during a monsoon season, what is the volume of recharge?
6. (a) Explain the general consideration for alignment.
(b) Design a regime channel to carry a discharge of 50 cumecs. Assume silt factor as 1.0.
7. (a) How does a diversion weir align. Explain the different components of a diversion weir scheme.
(b) What do you mean by a weir. What are different construction materials which may be used for weirs and how are the weirs classified on this score.
8. Design a vertical drop weir using Bligh's theory for the following data.

(a) Maximum flood discharge = 1200 cumecs.

(b) HFL before construction of weir = 172.5 m

(c) River Bed Level = 168.0 m

(d) FSL of canal = 171.5 m

(e) Allowable Afflux = 1 m

(f) Coefficient of creep = 11

The weir wall need not be designed and its dimensions may be taken as top width = 3 m; Bottom width = 6 m. Assume any other data not given.

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