Total No. of Questions – [06] Total No. of Printed Pages: 2

G.R. No.	

DECEMBER 2021 - ENDSEM EXAM

T. Y. B. TECH. (CIVIL) (SEMESTER - I)

COURSE NAME: Hydrology & Water Resources Engineering

COURSE CODE: CVUA31185

(PATTERN 2018)

Time: [1Hour] [Max. Marks: 30]

(*) Instructions to candidates:

5) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.

6) Figures to the right indicate full marks.

7) Use of scientific calculator is allowed

8) Use suitable data where ever required

Q.1 a Distinguish between controlled and uncontrolled flooding methods of surface irrigations? 4

Q.1 b A stream of 130 liters/second was diverted from a canal and 100 liters/second were delivered to the field. An area of 1.6 hectares was irrigated in 8 hrs. The effective depth of root zone was 1.7 m. The runoff loss in the field was 420 cu.m. The depth of water penetration varied linearly from 1.7 m at the head end of the field to 1.1. m at the tail end. Available moisture holding capacity of the soil is 20 cm per meter depth of soil. It is required to determine the water conveyance efficiency, water application efficiency, water storage efficiency and water distribution efficiency. 6

Q2 a Compare the lift irrigation and subsurface irrigation methods on the basis of advantages and limitations? 4

Q2 b The lowest portion of the capacity elevation curve of a proposed irrigation reservoir, draining 20 km^2 of catchment, is represented b the following data 6

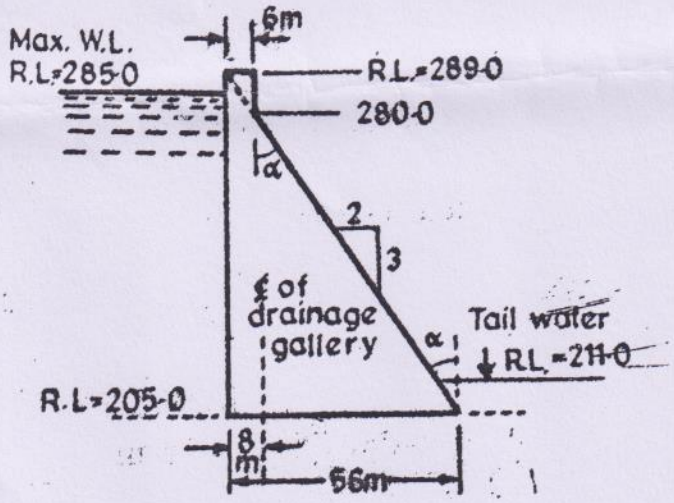
Elevation in m (RL)	Capacity in ha.m
600	24.2
602	26.2
604	30.3
606	36.8

The rate of silting for the catchment has been assessed to be 300 m^3/km/year. Assuming the life of the reservoir to be 50 years (1) compute the total dead load storage and the lowest sill level (LSL), if the main canal is 6km long with a bed slope of 1 in 1000, and the canal bed level at the tail end is t RL. 594.5 m. The FSD of the canal at the head is 80 cm. The crop water requirement is assessed as 250 ha.m.

If the dependable yield of the catchment is estimated to be 0.29m, what will be

the gross capacity of the reservoir?

Q.3 a	Categorize the spillways based on prominent features and explain any two types in detail.	4
Q.3 b	Enlist the causes of failure of Earthen dams. What the characteristics of hydraulic failure and seepage failure of the earthen dam?	6
Q.4 a	Explain the concept of spillway capacity and point out it's relationship with parameters on which it depends.	4
Q.4 b	For the given section of the gravity dam, determine 1) Weight of the dam 2) Hydrostatic force acting on the dam (on upstream as well as on downstream face)	6



Q.5 a	What are the silent features of Kennedy's theory for the design of earth channels based on the critical velocity concept and mention its limitations?	4
Q.5 b	An irrigation canal is to be designed based on Kennedy's theory, to allow a discharge of 44 m^3/sec. Assume rugocity coefficient N as 0.0255 and C.V.R. as equal to 1.0. The bed slope of the channel is 1/1600. Determine the depth of flow in the channel.	6
Q.6 a	Categorize various the factors for lining of canals and justify their necessity.	4
Q.6 b	Using Lacy's method, design a suitable channel in alluvium to carry a discharge of 50 m^3/s. Take mean sediment size as 0.3 mm	6