**R13** 

## Set No. 1

Code No: **RT41014** 

Time: 3 hours

### IV B.Tech I Semester Supplementary Examinations, October/November-2019 WATER RESOURCES ENGINEERING - II (Civil Engineering)

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any THREE questions from Part-B \*\*\*\*\*

### PART-A(22 Marks)

1.	a)	What is crop rotation? What are the advantages of crop rotation?	[4]
	b)	What are the drawbacks in Kennedy's theory?	[4]
	c)	Define: Proportionality, Sensitivity and Flexibility of outlets.	[3]
	d)	Draw a neat diagram of layout of diversion head works and label all parts.	[4]
	e)	What are the advantages and disadvantages of gravity dam over earth dam?	[3]
	f)	With a sketch, explain tainter gate.	[4]

### $\underline{PART} - \underline{B}(3x16 = 48 Marks)$

		$\frac{\mathbf{I} \mathbf{A} \mathbf{K} \mathbf{I} - \mathbf{D}}{\mathbf{J} \mathbf{X} \mathbf{I} 0} = 40 \text{ Marks}$	
2.	a) b)	Explain various factors affecting the duty. Discuss methods for improving duty. Compute the depth and frequency of irrigation required for a certain crop with data given below: Root zone depth = 100 cm; Field capacity = 22 %; Wilting point = 12 %; Dry density of soil = 1.5 g/cc; Consumptive use = 25 mm/day; Efficiency of irrigation = 50%.	[6] [10]
3.	a)	Design an irrigation channel to carry 35 cumecs of discharge, with B/D i.e., base width to depth ratio as 2.25. The critical velocity ratio is 1.0 and Kutter's rugosity coefficient is 0.022 and use Kennedy's method.	[10]
	b)	Explain how do you classify canals under various heads.	[6]
4.	a)	What are the various components of Sarda fall? Explain the design principles of each component	[8]
	b)	Explain the following outlets: (i) Kennedy's gauge outlet and (ii) Gibb's outlet.	[8]
5.	a)	Discuss the causes of failures of weirs on permeable foundations and suggest suitable control measures for each type of failure.	[6]
	b)	A hydraulic structure constructed on fine sand ( $C = 15$ ) has a total floor length of 35 m. Two sheet piles of depth 6 m and 8 m are provided at upstream side and downstream side of the floor, respectively. If the total head on the floor is 4 m, determine (i) Whether the hydraulic gradient is safe? (ii) Uplift pressure at points A. B. and C at a distance of 15, 25 and 35 m from the u/s end (iii)	LJ
		Thickness of floor at these points. Use Bligh's creep theory.	[10]

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[6]

- 6. a) Explain in detail the procedure for the determination of reservoir storage using mass inflow curve. [6]
  b) What do you understand by elementary profile of a gravity dam? Derive expression for determination of base width of such a dam based on (i) stress criterion and (ii) sliding criterion [10]
- 7. a) Discuss the criteria for safe design of earth dams.
  - b) Following data is available regarding an ogee spillway with vertical u/s face. Design discharge = 3500 cu.m/s; Normal reservoir level = 700.0 m; Average river bed level= 650.0 m; Length of spill way= 10 spans with a clear length of 10 m each; Thickness of pier= 1.5 m; Slope of d/s face of gravity dam = 0.7:1, Compute design head and determine downstream profile. Assume any data required and not given.

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