SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
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QUESTION BANK (DESCRIPTIVE)

Subject with Code: H&WRE (19CE0123) **Course & Branch**: B.Tech & CE

Year & Sem : III B.Tech & II-Sem **Regulation:** R19

UNIT –I

INTRODUCTION TO HYDROLOGY & HYDROGRAPH ANALYSIS

<table>
<tr><td>1.</td><td>Explain with the help of a diagram the hydrological cycle with components?</td><td>[L2][CO1]</td><td>[12M]</td></tr>
<tr><td>2.</td><td>(a) Demonstrate your understanding about precipitation?
(b) Explain types and forms of precipitation?</td><td>[L2][CO1]
[L1][CO1]</td><td>[4M]
[8M]</td></tr>
<tr><td>3.</td><td>Explain the factors which affect the rate of evaporation?</td><td>[L2][CO1]</td><td>[12M]</td></tr>
<tr><td>4.</td><td>What is mean by Infiltration? Explain the factors which affect the rate of infiltration?</td><td>[L1][CO1]</td><td>[12M]</td></tr>
<tr><td>5.</td><td>Explain the water budget method and the energy balance method?</td><td>[L2][CO1]</td><td>[12M]</td></tr>
<tr><td>6.</td><td>(a) With the help of a neat sketch explain the single tube infiltrometer?
(b) Explain elaborately about Φ-index and W-index?</td><td>[L2][CO1]
[L2][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>7.</td><td>(a) Compute the weekly evaporation from a reservoir using the water-budget method from the following data recorded during the week. Average inflow into the reservoir is 32.5m^3/s, average out flow from the reservoir is 40.2m3/s, average water spread area is 15.8km^2, storage at the beginning of the week is 9180ha-m and storage at the end of the week is 8360ha-m.
(b) What do you mean by Hydrograph and Unit hydrograph?</td><td>[L3][CO1]
[L1][CO1]</td><td>[6M]
[6M]</td></tr>
<tr><td>8.</td><td>Explain the construction and limitations of unit hydrograph.</td><td>[L3][CO1]</td><td>[12M]</td></tr>
<tr><td>9.</td><td>The ordinates of a 6-h unit hydrograph are given a storm had 3 successive 6-h intervals of rainfall magnitude of 3,5 and 4 cm respectively. Assuming a Φ-index of 0.23cm/hr and a base flow of 30m^3/s. Determine the resulting hydrograph
<table>
<tr><td>Time
In hour</td><td>0</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td></tr>
<tr><td>Ordinate of 6-hr U.H(m^3/s)</td><td>0</td><td>250</td><td>600</td><td>800</td><td>700</td><td>600</td><td>450</td><td>320</td><td>200</td></tr>
</table></td><td>[L4][CO1]</td><td>[12M]</td></tr>
<tr><td>10.</td><td>Write the method to measure the evaporation? Explain any one method.</td><td>[L2][CO1]</td><td>[12M]</td></tr>
</table>

UNIT –II

GROUND WATER& IRRIGATION

1	Explain in detail about the different types of aquifers with neat sketch.	[L1][CO1]	**[12M]**
2	(a) Explain ground water well and basic assumptions? (b) In certain alluvial basin of 120km^2, 100Mm^3 of ground water was pumped in a year and the ground water table dropped by 5m during the year. Assuming no replenishment, estimate the specific yield of the aquifer. If the specific retention is 12%, what is the porosity of the soil?	[L2][CO1] [L3][CO1]	**[6M]** **[6M]**
3	(a) What do you understand from Darcy's law, hydraulic gradient, seepage velocity. (b) Enumerate about specific yield and elaborate the factors contribute the specific yield.	[L2][CO1] [L2][CO1]	**[6M]** **[6M]**
4	(a) With a neat sketch explain Dupuit's theory for confined aquifer? (b) An undisturbed rock sample has an over dry weight of 1305gm. When it is completely saturated with kerosene it weighed 1436gm. The saturated sample, when immersed in kerosene displaced 605gm of kerosene. What is the porosity of the sample?	[L1][CO1] [L2][CO1]	**[8M]** **[4M]**
5	Explain the necessity and importance of Irrigation?	[L2][CO2]	**[12M]**
6	List out the advantages of Irrigation in detail.	[L1][CO2]	**[12M]**
7	(a) Briefly discuss in detail with flow chart about the types of irrigation. (b) Define duty and delta of irrigation?	[L1][CO2] [L2][CO2]	**[8M]** **[4M]**
8	Explain in detail about the methods of application of irrigation water.	[L1][CO2]	**[12M]**
9	(a) Enumerate in detail about factor affecting duty of irrigation water. (b) Explain in detail about the methods of improving duty	[L1][CO2] [L2][CO2]	**[6M]** **[6M]**
10	The left branch canal carrying a discharge of 20cumecs has a Culturable commended area of 20000 hectares? The intensity of rabi crop is 80% and base period is 120 days. The right branch canal carrying a discharge of 8 cumecs has a Culturable commanded area of 12000 hectares, intensity of irrigation of rabi crop is 50% and base period is 120 days. Compare the efficiencies of the two canal systems.	[L3][CO2]	**[12M]**

UNIT –III

WATER REQUIREMENT OF CROPS & CANAL REGULATION WORKS

1	Explain any five irrigation efficiencies	[L1][CO3]	**[12M]**
2	A water course commands an irrigation area 1000 hectares. The intensity of irrigation of rice in this area is 70%. The transplantation of rice crop takes 15 days and during the transplantation period the total depth of water required by crop on field is 500mm. during transplantation period, the useful rainwater falling on field is 120mm. Find during transplantation, at head of field and also at head of water course. Also calculate the discharge required in water course.	[L3][CO3]	**[12M]**
3	(a) Illustrate about G.C.A. and C.C.A. (b) Briefly detailed about Culturable cultivated area and Culturable uncultivated area?	[L2][CO3] [L1][CO3]	**[8M]** **[4M]**
4	A field of 4 hectares has an average root zone depth of 1.0m, a field capacity of 18%(both by weight). Assume that it's desirable to irrigation when 60% of available moisture has been extracted. The field is irrigated by a sprinkler system which delivers 300m3/hour over a period of 12 hours. What is water application efficiency? Density of soil is 1400kg/m3.	[L3][CO3]	**[12M]**
5	Explain with neat sketch about the types of fall in dam irrigation?	[L2][CO4]	**[12M]**
6	What is roughening device in canal? And also explain its varieties?	[L1][CO4]	**[12M]**
7	Write the design step by step procedure for sarada type falls with formulas?	[L3][CO4]	**[12M]**
8	Design a Sarada type fall for the following set of data. Full Supply Discharge- 14 m3/s, Bed width- 18 m, Full Supply Depth (FSD) - 1.5 m, Full Supply Level (U/S) -101.00 m, Full Supply Level (D/S) -100.00 m, U/S Bed Level - 99.5 m, D/S Bed Level- 98.5m, Natural Surface Level-99.5 m (D/S), Bligh's Coefficient (c) is -8.	[L4][CO4]	**[12M]**
9	(a) Write the function of cross regulators and distributor head regulators? (b) Write the criteria to design the crest level and length of downstream floor in cross regulator design.	[L1][CO4] [L3][CO4]	**[6M]** **[6M]**
10	Demonstrate about consumptive use of water? Write in detail about factors affecting consumptive use of water.	[L2][CO3]	**[12M]**

UNIT –IV

CROSS DRAINAGE WORKS& RESERVOIR PLANNING

1.	Elaborate about cross drainage work and detailed its types.	[L2][CO5]	**[12M]**
2.	(a) Illustrative the criteria's to select the suitable type of cross drainage work. (b) Write the three classifications of aqueducts?	[L2][CO5] [L1][CO5]	**[8M]** **[4M]**
3.	Describe in detail various investigation to be carried for reservoir planning.	[L3][CO5]	**[12M]**
4.	What are the various factors on which the selection of the site of a reservoir depends?	[L2][CO5]	**[12M]**
5.	Explain the different types of zones of storages in the reservoir with the help of neat sketch	[L1][CO5]	**[12M]**
6.	(a) Explain the mass inflow curve and demand curve. (b) Write a procedure for calculation of life of a reservoir.	[L2][CO5] [L2][CO5]	**[6M]** **[6M]**
7.	Write the calculation of reservoir capacity for a specified yield from mass inflow curve.	[L3][CO5]	**[12M]**
8.	What is flood routing and explain about method of flood routing by graphical method.	[L1][CO5]	**[12M]**
9.	Explain various types of reservoirs?	[L1][CO5]	**[12M]**
10.	(a) Explain the term life of reservoir in detail. (b) Write the calculation of determination of safe yield from reservoir.	[L2][CO5] [L2][CO5]	**[6M]** **[6M]**

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UNIT –V

DAMS& GRAVITY DAMS

1.	Classify all the various classifications of dams according to use in detail with sketches.	[L2][CO6]	**[12M]**
2.	(a) Discuss in brief about the merits and demerits of any two types of dam. (b) What do you understand by gravity dam?	[L2][CO6] [L2][CO6]	**[8M]** **[4M]**
3.	Discuss the physical factors that govern selection of type of dam.	[L2][CO6]	**[12M]**
4.	What are the factors to be considered for selection of site for a dam?	[L2][CO6]	**[12M]**
5.	(a) Explain with sketch about galleries in gravity dam? (b) Write briefly on various forces that act on a gravity dam.	[L1][CO6] [L2][CO6]	**[4M]** **[8M]**
6.	Discuss in detail various modes of failure of a gravity dam.	[L2][CO6]	**[12M]**
7.	Explain the stability analysis for dam carried out by analytical method.	[L3][CO6]	**[12M]**
8.	Draw and explain the elementary profile of a gravity dam.	[L2][CO6]	**[12M]**
9.	A masonry dam 6 m high and 1.5 m wide at the top and 4.5 m wide at the bottom, with vertical face. Determine the normal stresses at the toe and heel for reservoir empty and reservoir full conditions. Take ρ=2.4 and c=1.	[L3][CO6]	**[12M]**
10.	Discuss about the limiting height of a gravity dam.	[L1][CO6]	**[12M]**

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