Total No. of Questions :12]

SEAT No. :

P3891

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T. E. (Civil)

HYDROLOGY AND WATER RESOURCES ENGG.

(2008 Course) (Semester - II)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section II.***

2) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) State the various practical applications of hydrology. **[6]**

b) State the various factors governing site selection for rain guage station. **[6]**

c) What is probable maximum precipitation? How it is estimated. **[6]**

OR

Q2) a) Explain different forms of precipitation. **[6]**

b) Explain tipping bucket type rain guage. **[6]**

c) Describe with graph 'Intensity - Duration - Frequency relationship'. **[6]**

OR

Q3) a) Calculate the value of ϕ index from the following data of storm of 8 cm precipitation that resulted in direct runoff of 4.4 cm. **[8]**

Time in hrs.	1	2	3	4	5	6
Rainfall/hour in 'cm'	0.57	0.58	1.25	3.00	1.4	1.2

P.T.O.

b) Differentiate between evaporation and evapotranspiration. Also state Dalton's law & explain terms of it. **[6]**

c) What are 'W' and 'ϕ' Indices? Explain importance. **[2]**

OR

Q4) a) Explain the dilution technique of stream flow guaging. **[6]**

b) Explain the factors affecting evaporation. What are the methods used to control it. **[6]**

c) Explain Field capacity and permanent wilting point. **[4]**

Q5) a) The table below gives ordinates of 6 hour flood hydrograph over a catchment of 250 sq.km. The constant base flow is 10 m^3/sec. Compute the ordinates of 6 hour unit hydrograph and find depth of direct run - off. **[10]**

Time in hours	0	06	12	18	24	30	36	42	48	54	60
	10	110	260	210	160	110	80	60	45	35	25

66	72
15	10

b) State different methods of estimating Runoff. **[6]**

OR

Q6) a) Explain the methods of separating base flow. Compare merits and demerits of these methods. **[6]**

b) Explain concept of synthetic hydrograph & state step by step procedure of Synder's study. **[10]**

SECTION - II

Q7) a) Find duration in days between two watering if **[10]**

i) Field capacity of soil = 30%

ii) Apparent density of soil = 1.5%

iii) Permanent wilting point = 15%

iv) Effective depth of root zone = 75 cm

v) Daily consumptive use of water for the crop = 10 mm.

b) State the salient features of national water policy. **[6]**

OR

Q8) a) Define 'Duty'. State factors affecting duty. **[8]**

b) Determine the capacity of reservoir if its culturable area is 1,00,000 hectare. Following are details of crop pattern. **[8]**

Crop	Base period (Days)	Duty (ha/cumecs)	Intensity of Irrigation (%)
Sugarcane	330	2500	40
Wheat	120	1500	20
Rice	120	1000	10

Assume reservoir loss is 10% and canal loss as 5%.

Q9) a) State any two classifications of land drainage system and explain design aspect of tile drain. **[8]**

b) State concept of participatory Irrigation management. Explain role of water user's cooperative societies in PLM. **[8]**

OR

Q10)a) Explain the concept of Global water partnership. **[8]**

b) Compare lift irrigation system with canal irrigation system. **[8]**

Q11) Write short notes on:

a) Application of R.S. in reservoir sedimentation. **[6]**

b) Use of G.I.S. in crop pattern. **[6]**

c) Warabandi. **[6]**

OR

Q12)a) State Dupit's assumption and derive the equation for discharge from unconfined aquifer under steady state conditions. **[8]**

b) What are different irrigation acts? State the main features of Maharashtra Water Resources Controlling Authority Act 2005. **[10]**