Total No. of Questions : 12]

SEAT No. :

P3639

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T.E. (Civil)

HYDROLOGY AND WATER RESOURCES ENGINEERING

(2008 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Answer any three questions from Section I and three questions from Section II.***
2) ***Assume suitable data, if necessary.***
3) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) Explain with sketch the hydrological cycle. **[8]**

b) State various methods to measure evaporation. Discuss the factors affecting infiltration. Explain flooding type of infiltrometer. **[10]**

OR

Q2) a) In a year the annual rainfall recorded by the rainguages are as follows:**[10]**

Station	L	M	N	O
Rainfall in mm	700	500	300	440

If an error of 10% in the estimation is permissible. Determine the optimum number of rainguages.

b) Explain with graph the 'Intensity-Duration-frequency' relationship. **[8]**

Q3) a) Distinguish between evaporation and expotranspiration. Also state Dalton's equation and explain different terms in it. **[8]**

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b) Rainfall of magnitude 3.8cm and 2.8cm occuring on two consecutive four hours duration on a catchment of area 27km^2, produce falling hydrograph. Estimate rainfall excess and ϕ index. **[8]**

Time from start of rainfall (hrs)	-6	0	6	12	18	24	30	36	42	48	54	60	66
observed flow (cumecs)	6	5	13	26	21	16	12	9	7	5	5	4.5	4.5

OR

Q4) a) State various formulae to estimate flood and explain any two methods. **[8]**

b) With the help of concept sketch of hydrograph, name different components of hydrograph. Also explain base flow separation and its significance. **[8]**

Q5) a) What is meant by reservoir sedimentation? State factors affecting reservoir sedimentation. How will you reduce it? **[8]**

b) Write a note on various zones of reservoir with a neat sketch. **[8]**

OR

Q6) a) The mean monthly discharge at dam site is given below. To meet a constant discharge of 60m^3/sec; calculate the minimum amount of storage required. **[8]**

Month	J	F	M	A	M	J	J	A	S	O	N	D
Discharge m^3/s	80	65	55	40	35	45	70	100	125	110	100	90

b) What is apportionment of total cost of reservoir? Explain various methods of it. **[8]**

SECTION- II

Q7) a) Define: **[8]**

i) Kor depth, ii) Capacity factor

iii) C.C.A. iv) Delta

v) Duty vi) Base period

vii) Paleo irrigation viii) Catchment area

b) Determine the capacity of a reservoir if its cultivable area is 1,00,000 hectares. Following are details of crop pattern. **[10]**

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

Assume 10% as reservoir losses and 5% canal losses.

OR

Q8) 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 witting point = 15%

iv) Effect depth of root zone = 75 cm

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

b) Explain the factors affecting duty of crop. **[8]**

Q9) a) Explain Dupits and Thiems theory and state the assumptions made. **[8]**

b) In Recuperation Test of an open well, water level was depressed by 3.5m and pumping was stopped. After 90 minutes, the water level recuperated by 1.5m. Find **[8]**

i) Specific yield

ii) Diameters of the well, that will give the yield of 350 LPM, under the depression head of 2m.

OR

Q10)a) Enlist different types of tube wells and dug wells. Explain strainer type with a neat sketch. **[8]**

b) Explain with a neat sketch 'lift Irrigation'. **[8]**

Q11)a) Derive the expression for spacing for tile drain. **[6]**

b) Explain the methods of application of water to crops. **[10]**

OR

Q12)a) What is water logging? State its ill effects. Explain any one method to improve the sub-surface drainage? **[8]**

b) Write a short note on- **[8]**

i) Use of G.I.S. in crop pattern

ii) Warabandi.

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