Total No. of Questions : 10]

SEAT No. :

P2912

[Total No. of Pages : 3

[5669]-501

T.E. (Civil)

HYDROLOGY AND WATER RESOURCES ENGINEERING

(2015 Pattern)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.No.1 Or Q.No.2 Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, Q.No.7 or Q.No.8 and Q.No.9 or Q.No.10.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) How hydrology is interdisciplinary science. Explain in detail. **[6]**

b) Write a note on drip irrigation with neat sketch state advantages and disadvantages of drip irrigation **[4]**

OR

Q2) a) For a drainage basin of 600 km^2, isohyets drawn for a storm gave the following data **[5]**

Isohyetal (Interval) (cm)	15-12	12-9	9-6	6-3	3-1
Inter-isohyetal Area (Km^2)	92	128	120	175	85

Estimate the average depth of precipitation over the catchment.

b) An irrigable canal has gross command area of 60,000 hectars out of which 70% is irrigable. The intensity of kharif and rabbi season is 25% and 50% respectively. Find discharge required at the end of canal if duty at its head is 850 hectores/cumec for kharif season and 1,800 hectares/cumec for rabbi season. **[5]**

Time factor = 0.9

Capacity factor = 0.8

Q3) a) State and explain any two methods of revenue collection from farmers. **[4]**

b) Derive an expression for discharge from a well fully penetrating confined aquifer. **[6]**

OR

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Q4) a) Derive the formula to calculate discharge of a well in a unconfined aquifer. **[6]**

b) Define Paleo irrigation & Kor depth. Derive relation between Duty and Delta. **[4]**

Q5) a) What is hydrograph? Explain all the parts of the typical hydrograph. Explain fern shaped catchment. **[8]**

b) Given below are the ordinates of 6-h unit hydrograph for a catchment. Calculate the ordinates of the DRH due to a excess rainfall of 3.5 cm occuring in 6 h. **[10]**

Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69
U. H. Ordinate (m^3/s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0

OR

Q6) a) What is S-curve hydrograph? Explain its construction with sketch. **[8]**

b) In a 10 hr storm rainfall depths occurred over a the catchment are **[10]**

Hour	1	2	3	4	5	6	7	8	9	10
Depths (cm/hr)	1	1.5	5	6	10.5	8.5	9	7	1.5	1.5

Surface run off resulting from the storm is equivalent to 20 cm of depth over the catchment. Determine

i) Average infiltration, and

ii) Average rate of infiltration.

Q7) a) Explain how will you fix the capacity of reservoir using annual inflow and outflow. **[8]**

b) Explain fixation of reservoir capacity using elevation capacity curve and dependable yield. **[8]**

OR

Q8) a) What are various reservoir losses. What are various measures to control these losses. **[8]**

b) What is reservoir sedimentation? What is the significance of trap efficiency? Explain with neat sketch. **[8]**

Q9) a) Write a note on ancient system of water distribution which still exist in North Maharashtra. **[8]**

b) Explain Global Water Partnership. (GWP) **[8]**

OR

Q10)a) What is water logging? Explain tile drain method and also state formula for spacing of tile drains. **[8]**

b) Draw a neat section for lift irrigation scheme and state various components of lift irrigation scheme. Explain various design steps in lift irrigation system. **[8]**

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