Total No. of Questions : 10]

SEAT No. :

P3616

[Total No. of Pages : 3

[4858] - 1001

T.E. (Civil) (Semester - I)

Hydrology and Water Resource Engineering

(2012 Pattern) (End-Sem.)

Time : $2\frac{1}{2}$ *Hours]* *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) How hydrology can be useful in design of water supply, agriculture water requirements, navigation, flood control and hydraulic structures? **[5]**

b) Explain isohyetel method with neat sketch. **[5]**

OR

Q2) a) The normal annual depths recorded at five rain gauge stations, A, B, C, D and E respectively are 910, 1070, 1410, 810 and 590 mm respectively. Determine the optimum number of rain gauge stations to be established in the drainage basin. If it is desired to limit the error in the mean value of rainfall to 10%. **[5]**

b) State deltas for Jowar, Bajra, Sugarcane, Rice and Wheat also explain methods to improve duty. **[5]**

Q3) a) Differentiate between flood irrigation and sprinkler irrigation system. **[5]**

b) Explain with neat sketch bubbler method to determine the stage of river and also state the advantages of this method. **[5]**

OR

P.T.O.

Q4) a) In a water table aquifer of 50 m thickness, a 20cm diameter well is pumped at uniform rate of 0.05 m^3/s. If the steady state drawdown measured in the observation wells located at 10m and 100m distance from the well are 6.5 m and 0.25 m respectively, determine the hydraulic conductivity of the aquifer. **[6]**

b) Explain various types of tube wells and explain construction of any one. **[4]**

Q5) a) What do you mean by base flow? Enlist the methods of base flow separation and explain any two in details. Explain with neat sketch. **[8]**

b) The observed annual flood peaks of a stream for a period of 40 years from 1942 to 1981 in m^3/s are given below. **[10]**

395, 619, 766, 422, 282, 990, 705, 528, 520, 436,

697, 624, 496, 589, 598, 359, 686, 726, 527, 310,

408, 721, 814, 459, 440, 632, 343, 634, 464, 373,

289, 371, 522, 342, 446, 366, 699, 560, 450, 610,

Construct the probability plot for the annual flood on ordinary graph. Determine the flood magnitude with return period of 100 years.

OR

Q6) a) What is hydrograph? Draw a single peaked hydrograph showing its all components. Also state uses of hydrograph. **[8]**

b) Find the ordinates of flood hydrograph resulting from a storm with rainfalls of 3.0, 6.5 and 4.5 cm each during successive 4-hours. The ordinates of a 4-hour unit hydrograph are given below: **[10]**

Time (hours)	0	4	8	12	16	20	24	28	32	36	40	44
UHO (m^3/s)	0	110	320	515	380	305	250	230	150	95	50	0

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 warabandi. **[8]**

b) Explain Participatory Irrigation Management. **[8]**

OR

Q10) a) What is water logging? What are the ill effects of water logging? How will you control it? **[10]**

b) Draw a neat section for lift irrigation scheme and state various components of lift irrigation scheme. State the authorities from whom permission for implementation of lift irrigation is required. **[6]**