

Total No. of Questions : 8]

SEAT No. :

P4580

[Total No. of Pages : 2

[4860]-1051

M.E. (Civil) (Water Resources and Environmental Engg.)

HYDROLOGY

(2013 Credit Pattern)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer any FIVE questions.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of Calculator is allowed.
- 5) Assume Suitable data if necessary.

- Q1) a) Write a note on hydrologic cycle [4]
b) Describe with the neat sketch any three methods of separation of base flow from the hydrograph of runoff (stream flow hydrograph) indicating the situation under which you advocate them. [6]
- Q2) a) The runoff of a stream in the month of September has a mean and standard deviation of 265 and 200 cumec- months. Assuming that log normal distribution is a good fit, find the probability that September runoff in this stream in any year exceeds 350 cumec- months. What is the probability that the September runoff would fall in the range 150 to 350 cumec-months? [5]
b) Write a note on selection of distribution function and estimation of parameters. [5]
- Q3) a) Explain the method of design flood estimation using the rational method. [4]
b) The analysis of 30 year flood data at a point on a river yielded $x = 1200 \text{ m}^3/\text{s}$, and $s_x = 650 \text{ m}^3/\text{s}$. For what discharge would you design the structure at this point to provide 95% assurance that the structure would not fail in the next 50 years? Use Gumbel's method. [6]

P.T.O.

- Q4)** a) Explain how the yield of an open well can be determined using recuperation test. [5]
 b) Define the terms: (i) Aquifuge, (ii) Aquiclude, (iii) Aquitard (iv) confined aquifer (v) perched groundwater. [5]
- Q5)** a) A 20 cm well penetrates 30 m below static water level (GWT). After a long period of pumping at a rate of 1800 lpm, the draw downs in the observation wells at 12m and 36 m from the pumped well are 1.2 m and 0.5 m, respectively. Determine (i) Transmissibility (ii) the drawdown in the pumped well assuming R=300 m, (iii) specific capacity of the well. [5]
 b) What are the advantages of ground water compared to surface water? [5]
- Q6)** a) What are the analog models? Explain any two models. [6]
 b) What is ground water pollution? How the industrial use of water affects on it. [4]
- Q7)** a) Enlist the various methods of artificial recharge of ground water and explain any one in detail. [5]
 b) What are different pumping equipment used to pump the ground water? Explain one in detail with neat diagram. [5]
- Q8)** a) Distinguish between: (i) Maximum probable flood and design flood, (ii) Return period and exceedence probability. [6]
 b) Write a short note on chi square test. [4]

