Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Winter 2018 - 19 Examination

Semester: 2 **Date: 11/12/ 2018**
Subject Code: 03214152 **Time: 2:00 pm to 4:30 pm**
Subject Name: Hydrologic Modelling **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 **A)** Define Tenth percentile , First quartile , Third quartile and Inter quartile range . **(05)**

B) Following are the differential manometer readings of a venturymeter : **(05)**
21.49 , 22.67 , 24.62 , 24.18 , 22.78 , 22.56 , 24.46 and 23.79
Illustrate the Box plot for the given data.

C) If a random variable has the standard normal distribution , find the probability that it will take on a value : **(05)**
Between 0.00 & 2.50 , Between 1.52 & 2.63 , Between -1.15 & -0.15 and Between -1.50 and 1.55 .

Q.2 **Answer the following questions. (Attempt any three)** **(15)**

A) Formulate a rainfall runoff model assuming the values of k and p_0 with the help of the following data :
Rainfall , cm : 44.70 , 18.11 , 27.75 , 17.13 , 09.83 , 15.90, 13.80 , 15.86 , 01.65 , 01.28 , 13.28 and 31.53
Runoff , cm : 23.85 , 13.61 , 16.05 , 16.27 , 11.62 , 08.62 , 05.52 , 04.33 , 02.48 , 02.07 ,03.02 and 07.68

B) Validate the above model by Coefficient of determination.

C) Validate the above model by Theil's U index of inequality

D) Validate the above model by Refined index of agreement

Q.3 **A)** Consider the following time series with record length of 8 years. Apply a moving average filter with equal weight of 0.25 of smoothening interval of 4 yields **(07)**
Y = (13 ,13 , 22 , 22 , 22 , 31 , 31 , 34)

B) From the following high flood discharge data find out the maximum flood having probability of100 years event : **(08)**
7670 , 7230 , 21600 , 19400 , 7290 , 17500 , 7290 , 17500 , 7480 , 7520 , 15300 , 14700 , 7700 , 7880 , 8140 , 13800 , 13600 , 13600 , 7700 , 7880 , 8140 , 8140 , 8140 , 13300 , 13000 , 13000 , 11700 , 11200 , 10500 , 10500 , 8210 , 8450 , 8700 , 8790 , 8950 , 9410 , 10200 , 9740 and 9660 cumec

OR

B) W r t the data given in Q . 3 (B) above ,what is the probability of having 20000 cumec flood for 75 years data? **(08)**

Q.4 **A)** Consider the following annual maximum flood series for the Narmada river at Garudeshwar : **(07)**
715 , 74 , 45 , 22, 13, 206 , 71, 40 , 20 , 13 , 173, 62, 38 , 20, 13,151, 60 , 35, 19 , 9 , 139 , 56 , 32, 17 , 8 , 134 , 53, 29 , 14,7 , 83, 48 , 28 , 14 , 3, 75 , 47 , 27 and 13 cumec .
Determine whether the largest flood is an outlier .

OR

Q.4 **A)** Discuss population versus sample **(07)**

Q.4 **B)** Formulate a hypotheses **(08)**