Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY
Winter Examination-2018

Subject Name : Water Resources Engineering

Subject Code : 4TE05WRE1 Branch: B.Tech (Civil)

Semester : 5 Date :28/11/2018 Time : 10:30 To 01:30 Marks : 70

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Choose the correct answer of the following: (14)

a) The hydrological cycle is powered by _____ (Water, Sun, Gravity)
b) _____ is characterized by frozen Drizzle type form of precipitation (Snow Flake, Glaze, Sleet)
c) ____ method does not taken into account the orographic influence in determination of average rainfall (Thiessen Polygon, Isohyetal)
d) Evaporation is the process by which water is changed to vapors at the free surface, below _____ point (freezing, melting, boiling) of water.
e) _____ generally used to measure transpiration (Phytometer, Atmometer, Lysimeter)
f) The rainfall in excess of a particular value of φ-index for the entire pattern of storm rainfall is called _____ (Steady rain, Supra rain, Hefty rain)
g) ____ method of seafloor mapping is very time consuming, especially when charting deep water (Echo-sounding, Lead Lines, Sounding rods)
h) _____ is commonly referred as fresh circulating ground water (Meteoric, Juvenile, Connate)
i) _____ can absorb water but cannot transmit significant amounts of water (Aquifuge, Aquiclude, Aquitard)
j) ____ is equal to the product of hydraulic conductivity and the saturated thickness of the aquifer (specific yield, storage coefficient,Transmissivity).
k) National Water Policy is formulated by the Ministry of (Water Resources, Water and Power, Water and Environment)
l) The reservoir capacity corresponding to a specific yield is determined by ___ Curve and Demand Curve (Double mass, Mass inflow, Discharge)
m) _____ Irrigation is suitable for Sugar cane crop. (Furrow, Border, Check basin)
n) In sediment transported by river, the _____ load is generally smaller (Suspended, Bed).

Attempt any four questions from Q-2 to Q-8

Q-2 (a) Why missing data of rainfall is estimated? Explain normal ratio method for estimating the missing rainfall data. (03)

(b) Describe Thiessen polygone and Isohytal methods to compute average rainfall (04)

(c) In a watershed, there are 4 rain gauge stations with their normal annual precipitation amounting 820, 560, 410 and 360 mm respectively. Determine the optimum number of rain gauges in the watershed. If it is designed to limit the error in the mean value of rainfall in the watershed to 10%. (07)

Q-3 (a) Explain Dalton's law of evaporation and discuss factors affecting evaporation. (07)

(b) What is transpiration? What are the various factors that affect transpiration? How would you measure transpiration? What is transpiration ratio? (07)

Q-4 (a) What is unit hydrograph? What are the basic proportions of the unit hydrograph theory? Discuss the limitations of unit hydrograph theory. (07)

(b) The following are the ordinates of 12-hr unit hydrograph, determine ordinates of 4-hr unit hydrograph for the watershed by S-curve method. (07)

Time in hr	0	4	8	12	16	20	24	28	32	36	40	44	48
12-hr U. H. O.	0	16	48	84	120	108	96	84	68	50	10	6	0

Q-5 (a) Define design and chance flood (02)

(b) For a river, the estimated flood peaks for two return periods by the use of Gumbel's method are as follows: (05)

Return period (years)	Peak flood (m^3/s)
100	430
50	400

What flood discharge in this river will have a return period of 1000 years?

(c) Explain structural and non-structural methods of flood mitigation. (07)

Q-6 (a) Derive Thiem equation for discharge from a well in confined aquifer. The well fully penetrates it. (07)

(b) An unconfined aquifer has a thickness of 30 m. A fully penetrating 20 cm diameter well in this aquifer is pumped at a rate of 40 lit/sec. The drawdown measured in two observation wells is 7.5 m and 0.5 m respectively. Determine the average co-efficient of permeability of the aquifer. At what distance from the well the drawdown is insignificant. (07)

Q-7 (a) Discuss water resources development and irrigation potential in India. (07)

(b) Write short note on inter basin transfer of water. (07)

Q-8 (a) Define (i) Vadose zone (ii) Cash Crop (iii) Duty of water (03)

(b) Explain augmentation of water (04)

(c) Briefly discuss various water conservation methods (03)

(d) What is water harvesting? Explain rain water harvesting (04)