

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Water Resources Engineering

Subject Code: 4TE05WRE1

Branch: B.Tech.(Civil)

Semester: 5

Date: 22/03/2017

Time: 02:30 To 05:30

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 Attempt the following questions: (14)

- | | |
|---|----|
| a) What is hydrology? | 01 |
| b) What is the minimum distance of nearest object from a rain-gauge? | 01 |
| c) What is infiltration capacity? | 01 |
| d) Define equivalent moisture. | 01 |
| e) Which instrument is used to measure evapotranspiration? | 01 |
| f) Define hyetograph. | 01 |
| g) Define isochrones. | 01 |
| h) What is stream flow? | 01 |
| i) What is Frequency of flood? | 01 |
| j) A device used in a tube-well for preventing entry of silt and sand is called | 01 |
| k) The difference in levels in a well before and after pumping is called _ | 01 |
| l) Define transmissibility. | 01 |
| m) Define soil moisture. | 01 |
| n) Define trap efficiency. | 01 |

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

Q-2 Attempt all questions (14)

- | | |
|--|----|
| (a) Describe the process of the hydrologic cycle with a neat sketch. | 05 |
| (b) Write short note on causes of drought. | 05 |
| (c) Distinguish between: aquiclude and aquitard. | 04 |

Q-3 Attempt all questions (14)

- | | |
|--|----|
| (a) What are the factors that affect evaporation losses? | 05 |
| (b) Explain the procedure of separating base flow in a hydrograph. | 05 |
| (c) Write short note on types of design floods. | 04 |

Q-4 Attempt all questions (14)

- | | |
|---|----|
| (a) What is the need for planning of water resources projects? | 05 |
| (b) Explain water use management. | 05 |
| (c) In to a stream, with no trace of salt initially, a salt solution with a concentration of 20 mg/c.c. is introduced at a constant rate of 2 litres per minute. The samples collected at a downstream section sufficiently far away indicated an equilibrium salt concentration of 0.05 ppm. Determine | 04 |



the discharge in the stream from this data.

Q-5 Attempt all questions (14)

- (a) Enlist recording and non-recording type of rain gauge and describe any two. 07
- (b) The isohyetal map for 24 hour storm gave the area enclosed between different isohyets, as follows: 07

Isohyets (mm)	21	20	19	18	17	16	15	14	13	12
Catchment area enclosed (km ²)	543	1345	2030	2545	2955	3280	3535	3710	3880	3915

Determine the average depth of rainfall over the basin.

Q-6 Attempt all questions (14)

- (a) Explain the factors affecting runoff. 07
- (b) The ordinates of a 3-hr unit hydrograph of a basin at 6 hr interval are given below. 0, 3, 5, 9, 11, 7, 5, 4, 2, 1, 0 cumecs. Derive the storm hydrograph due to a 3-hr storm with a total rainfall of 15 cm. Assume an initial loss of 0.5 cm and a ϕ -index of 1 cm/hr. Take base flow = 4 cumecs. 07

Q-7 Attempt all questions (14)

- (a) Explain the procedure for the development of storm hydrographs. 07
- (b) Derive an expression for discharge from a well which is fully penetrated in confined aquifer. 07

Q-8 Attempt all questions (14)

- (a) What are different methods for the measurement of discharge of a river? Discuss the salient features of the area-velocity method. 07
- (b) The base period, duty of water and area under irrigation for various crops under a canal system are given in the table below. If the losses in the reservoir and canals are, respectively, 15% and 25%, determine the reservoir capacity. 07

Creep	Wheat	Sugarcane	Cotton	Rice	Vegetable
Base period B (days)	120	320	180	120	120
Duty D (ha/cumecs)	1800	1600	1600	800	700
Area irrigated (ha)	15000	10000	5000	7500	5000

