

SUBJECT CODE NO:- P-376
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (CIVIL) Examination MAY/JUNE-2016
Water Resource Engineering - I
(Revised)

[Time: Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B

- i) Q.No.1 and Q.No.6 are compulsory.
 ii) Attempt any two questions from remaining questions from each section.
 iii) Assume suitable data, if necessary.

Section A

- Q.1 a) What precautions should be considered during selection of rain gauge location? 03
 b) Describe how the evaporation is measured by using atmometers. 04
 c) Explain with neat sketch master depletion cure. 03
- Q.2 a) The following are the rates of rainfall for successive 20 minutes storm in mm/hour 22, 22, 95, 72, 12.5, 12.5, 50. Taking the value of ϕ – index of 31mm/hour, find out the net runoff in mm and the total rainfall. 07
 b) Discuss the various procedures available to estimate the missing precipitation record. 08
- Q.3 a) What do you understand by synthetic unit hydrograph? Explain how it is derived. 06
 b) Find the ordinates of a flood hydrograph resulting from a storm with rainfall 3.75 cm during successive 3 hours. The ordinates of a 3-hours unit hydrograph are given below. 09
- | Time(hrs) | 03 | 06 | 09 | 12 | 15 | 18 | 21 | 24 | 03 | 06 | 09 | 12 | 15 | 18 | 21 | 24 |
|---------------------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|
| Ordinates of unit hydrograph (cumech) | 0 | 115 | 370 | 510 | 395 | 315 | 252 | 231 | 172 | 127 | 96 | 64 | 43 | 25 | 12 | 0 |
- Assume infiltration index $\phi = 2.5\text{mm/hr}$ and base flow of 12 cumec.
- Q.4 a) What do you understand by a crest gauge? Explain the principle of working of any one type of crest gauge. 07
 b) Give the various empirical formulae used for the estimation of peak flood discharges. 05
 c) Define W-index. 03
- Q.5 a) Explain how to find missing rainfall data. 05
 b) Explain working of weighing bucket type recording raingauge. 05
 c) How can evapotranspiration be reduced? 05

Section B

- Q.6 a) What are the remedial measures of water logging? 04
b) Explain with neat sketch interference of wells. 04
c) Define watershed management. 02
- Q.7 a) Derive an expression for the steady state discharge of a well fully penetrating into a unconfined aquifer. 07
b) Design a tube well for following data: 08
i. Yield required = $0.20\text{m}^3/\text{s}$
ii. Radius of circle of influence = 210m
iii. Coefficient of permeability = 50m/day
iv. Drawdown = 5.0m
v. Thickness of confined aquifer = 28m
- Q.8 a) Water is released at the rate of 15 cumec at the head of a canal. If duty at the field is 1100 hectare/cumec and loss of water in transit is 30%, find the area of the land that can be irrigated. 05
b) Define 06
i. Overlap allowance
ii. Intensity of irrigation
iii. Wilting point
c) Discuss briefly the factors affecting the choice of the method of irrigation. 04
- Q.9 a) What are the steps involved in watershed management? 05
b) What is necessity of watershed management? 05
c) Write short notes on important crops in India and their seasons. 05
- Q.10 a) Explain with neat sketch border strip method. 05
b) Explain with neat sketch artesian gravity well. 05
c) Explain constant level pumping test. 05