Total No. of Printed Pages:2

SUBJECT CODE NO:- H-193
FACULTY OF SCIENCE AND TECHNOLOGY
T.E. (Civil) (Sem-II)
Water Resource Engineering - I
[OLD]

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B i) Question 1 & 6 is compulsory.
ii) Answer any 2 questions of remaining of each section.
iii) Assume suitable data if necessary and state it clearly.

SECTION A

Q.1 a) What are the various methods available to calculate average precipitation over a basin? 04
b) What do you understand by the term infiltration? How can we measure it in the field? 04
c) Enlist various practical applications by hydrology. 02

Q.2 a) What is a rainfall hyetograph? How is it derived from a rainfall mass curve. 05
b) How is evaporation measured by using ISI standard pan? 05
c) The total observed runoff volume during 8h storm with a uniform intensity of 1.6cm/h is $25 \times 10_{6m3}$. If the area of the basin is 280 km_2, find the average infiltration rate for the basin. 05

Q.3 a) Explain various base flow separation techniques. 05
b) A 4-h hydrograph for a project site in Mahanadi basin is given below. Calculate
(i) a 12 h-unit hydrograph and (ii) 2 h-unit hydrograph by S hydrograph approach.

Time (h)	0	2	4	6	8	10	12	14	16	18	20	22	24	26
UH ordinates(m^3/s)	0	30	110	170	210	180	120	80	40	35	20	15	5	0

10

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 **Write short note on (any three)** 15
a) Log Pearson type III distribution
b) Determination of average precipitation over the catchment
c) Gumbel's distribution
d) Synthetic unit hydrograph
e) Horton's infiltration equation.

SECTION B

Q.6 a) Explain the terms "storage coefficient", and "coefficient of transmissibility". 04
b) Define the terms i) Aquifer ii) Aquiclude iii) Aquifuge iv) Aquitard 04
c) What do you understand by a partially penetrating well? 02

Q.7 a) Explain Darcy's law. What are its assumptions? Discuss its validity. 07
b) The discharge at outlet is $0.2m^3/s$. Average losses from outlet to field are 10% of water flowing though the outlet. If kor and kor depth for wheat and rice are 3 weeks, 120mm and 2 weeks, 250mm, calculate how much area can be irrigated for each crop. 08

Q.8 a) Explain with neat sketch different water shed structure in drainage line treatment. 07
b) Explain steps involved in watershed management and small structures. 08

Q.9 a) Obtain an expression for discharge through open well by recuperation test. 07
b) Discuss remedial measures of water logging. 08

Q.10 Write short note on : (any three) 15
a) Recharge of groundwater
b) Consumptive use of water
c) Constant level of pumping test
d) Important crops in India and their seasons