Subject Code: XXXXX

Roll No:

BTECH

(SEM-7) IRRIGATION AND WATER RESOURCES ENGINEERING 2021-22

TIME:3 HOUR ***Total Marks: 100***

Instruction: Attempt the questions as per the given instructions. Assume missing data suitably.

SECTION - A

Attempt *All Parts* in Brief **2*10 = 20**

Q1	Questions	Marks
(a)	Describe Probable Maximum Precipitation (PMP).	2
(b)	Define water budget equation.	2
(c)	What is the assumption made in unit hydrograph?	2
(d)	Define trickle irrigation system.	2
(e)	Explain Lacey's silt factor.	2
(f)	Define canal regulation works.	2
(g)	Define silting and scouring in canals.	2
(h)	Define the objectives of diversion headwork.	2
(i)	Explain specific capacity of well.	2
(j)	Define specific yield.	2

SECTION - B

Attempt *Any Three* of the following **3*10 = 30**

Q2	Questions	Marks
(a)	Write a short note on synthetic unit hydrograph. How will you derive the synthetic unit hydrograph from a number of unit hydrograph ? Illustrate the method with suitable example in a tabular form.	10
(b)	Define following terms: i. Depth area duration curve. ii. Probable maximum precipitation. iii. Evapotranspiration. iv. **Φ** - index.	10
(c)	What is the problem of water logging ? What are the poor effects of water logging ? Describe some suitable remedial measures against water logging in brief.	10
(d)	Using Lacey's theory, design a trapezoidal irrigation channel (side slope, 1H : 2V) carrying discharge of 40 m^3/sec. Take silt factor as 1.0.	10
(e)	e. Write short notes on: i. Well shrouding and well development. ii. Types of open wells. iii. Infiltration galleries. iv. Hydraulic conductivity.	10

SECTION - C

Attempt *Any One* of the following **5*10 = 50**

Q3	Questions	Marks
(a)	A catchment has six raingauge stations. In a year, the 2. 3. annual rainfall recorded by <table><tr><td>Station</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr><tr><td>Rainfall(cm)</td><td>82.6</td><td>102.9</td><td>180.3</td><td>110.3</td><td>98.8</td><td>136.7</td></tr></table> Calculate the optimum number of raingauges stations in the catchment for 10% error.	10
(b)	Define infiltration and describe the factors that affect the process of infiltration. How will you measure the rate of infiltration?	10

Q4	Questions	Marks
(a)	Describe the various method of irrigation system. Define sprinkler irrigation system with neat sketch.	10
(b)	What is meant by crop rotation ? What are the advantages of crop rotation? Describe in brief with suitable examples.	10

Q5	Questions	Marks
(a)	Water course has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40 % and for B is 35 % both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 10 cm and for B is 16 cm.	10
(b)	What do you understand by regime channel ? Explain the initial regime and final regime of a channel in Lacey's theory.	10
Q6	**Questions**	**Marks**
(a)	Distinguish between perennial and inundation canal. Describe the various factors considered for alignment of a canal.	10
(b)	Design a concrete lined channel of triangular section to carry a discharge of 45 m^3/sec at a slope of 1 in 1000. The side slopes of the channel are 1.5:1 and Manning's rugosity coefficient for lining material as 0.018.	10
Q7	**Questions**	**Marks**
(a)	Describe confined and unconfined aquifer with suitable diagram. Derive the expression for the discharge through confined aquifer.	10
(b)	Define following terms : i. Aquifer. ii. Aquiclude. iii. Aquitard. iv. Aquifuge. v. Porosity.	10