Enrollment No: _____ Exam Seat No:_____

C. U. SHAH UNIVERSITY
Winter Examination-2022

Subject Name: Irrigation Engineering

Subject Code: 4TE05IRE1 **Branch: B.Tech (Civil)**

Semester: 5 **Date: 28/11/2022** **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) Define irrigation Engineering.
b) Define Capillary water.
c) What is the permanent wilting point of a Plant?
d) Define irrigation frequency.
e) Write full form of GCA.
f) Write at least three names of the Rabi crop.
g) Give the three names of the biannual crop.
h) Define water application efficiency.
i) Write a unit for the duty of water.
j) Define Delta.
k) Define culturable cultivated area.
l) What is optimum moisture content?
m) What do you mean by multipurpose water resources project?
n) Define river training work.

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

Q-2 **Attempt all questions**

(a) Describe types of irrigation systems with a neat sketch. **(7)**
(b) What is the necessity of irrigation and write various benefits of it? **(7)**

Q-3 **Attempt all questions**

(a) Draw a neat sketch and explain soil water classification **(7)**
(b) Explain various methods for improving the duty of water. **(7)**

Q-4 **Attempt all questions**

(a) Define surface irrigation method. Write the design aspect of the Border strip method along with its advantages & disadvantages. **(7)**
(b) Write a short note on “the Furrow irrigation method”. **(7)**

Q-5 **Attempt all questions**

(a) Derive an equation that represents a relation between delta, duty, and base period. **(7)**

(b) Give a comparison of Sprinkler irrigation and Drip irrigation method. **(7)**

Q-6 **Attempt all questions**

(a) If rice requires a 12.5 cm depth of water at an interval of 12 days, and the base period is 120 days, find out the delta for rice. **(3)**

(b) Find the delta of a crop if the duty is 1800 ha/cumec and the base period is 130 days. What would be the duty if the delta is increased by 20% and the base period is reduced by 10 days? **(4)**

(c) The gross command area for a distributary is 6000 ha, 80% of which is culturable irrigable. The intensity of irrigation for the rabi season is 50% and for the kharif is 25%. If the average duty at the head of the distributary is 2000 ha/cumecs for the rabi season and 900 ha/cumecs for the kharif season, find out the discharge required at the head of the distributary from the average demand consideration. **(7)**

Q-7 **Attempt all questions**

(a) Give a classification of the irrigation canal based on discharge and relative importance along with a sketch. **(3)**

(b) Write design steps to design the channel by Lacey's Theory. **(4)**

(C) What is canal alignment and discuss general considerations for canal alignment **(7)**

Q-8 **Attempt all questions**

(a) Write briefly about "Canal Losses" **(3)**

(b) Define the following term (i) Aquifer (ii) Transmissivity (iii) Specific yield (iv) Specific retention. **(4)**

(c) What is meant by waterlogging? Discuss the causes of waterlogging. **(7)**