

BACHELOR OF ENGINEERING (CIVIL ENGINEERING) EXAMINATION 2022

[Forth Year; Second Semester]

Water Resources Engineering IIE

Total Time: Four Hours for 70 Marks

Full Marks 70
(Part I: 35 + Part II: 35)*Use a separate Answer-Script for each part*

No. of questions	Part I (35 Marks)	Marks
<i>Attempt All Questions</i>		
1	(a) Write down and describe the River classification on the basis of Topography.	3+6=9
	(b) Write down and describe the River classification on the basis of Flood Hydrograph.	2+4=6
	(c) Write down and describe the classification of River Indian Rivers.	2+4=6
	(d) Why the Himalayan Rivers are perennial in most of the cases.	2
	(e) What type of Rivers are called Tidal River?	2
2	(a) In a non-regime river, what is the expression of effective Tractive force? What is called critical Tractive force?	2+2=4
	(b) A River carries 115 cumecs of water, with a bed load concentration of 45ppm, by weight. The median diameter of the grains of the bed material sediment may be taken as 0.35mm. Estimate the bed load transport by Meyer-Peter's Formula.	6

B.E. CIVIL ENGINEERING FOURTH YEAR SECOND SEMESTER – 2022
Subject : WATER RESOURCES ENGINEERING IIE (ELECTIVE) (PART II)

Time 4 hours Full marks 35

USE SEPERATE ANSWERS SCRIPT FOR EACH PART

1. Discuss the different parameters used to define geometry of a meandering river using neat sketches. Indicate how meandering of a river channel is related to flow depth, average river width, bed slope and hydraulic depth. 7+3 = 10

2. (a) Derive the expression for scour depth at a contraction for a straight rectangular channel using a neat sketch. 6

(b) Calculate the maximum scour depth at a circular pier using Melville and Coleman's method for the following data: 10

Pier diameter, $b = 2.5$ m

Approaching flow depth, $h = 3.4$ m

Discharge per unit width, $q = 11.9$ m²/sec

Sediment size $d_{50} = 20$ mm, $d_{95} = 85$ mm and $d_{max} = 99$ mm

Take reasonable values of data not supplied.

3. What are the objectives of river training works? Discuss with neat sketches different river training works used for guiding river flow, deflecting current and bank protection. 3+6=09