BACHELOR OF ENGINEERING IN CIVIL ENGINEERING EXAMINATION 2023
(Fourth Year, Second Semester)

WATER RESOURCES ENGINEERING IIE

Time: Three Hours   **Full Marks: 100**

SL No		Attempt all questions, BUT 2A OR 2B. Assume suitable values for the parameters if not supplied		Marks
1	(a)	Write down and describe the River classification on the basis of Topography.	CO1	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
2A	(a)	In a non-regime river, what is the expression of effective Tractive force? What is called critical Tractive force?	CO2	3+3=6
	(b)	Derive the expression of Tractive force on the bed of the river, with neat sketch.		5
	(c)	Deriver the expression of Tractive force at the bank of a river.		8
	(d)	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
2B	(a)	What is called braided river? What are the probable reason for developing the braided river?	CO2	2+5=9
	(b)	Explain the precondition of developing cut-off.		8
	(c)	A river cross section was initially axisymmetric, but with time the same became in-axisymmetric. Explain the reason.		8
3	(a)	What is called river 'Bend' and 'River Meandering'? Explain their difference briefly with sketches	CO3	5
	(b)	Explain the causes of meandering.		5
	(c)	What type of river training work structure may be provided to avoid the meandering and explain g its working principle.		7
	(d)	Explain the meander indices.		8
4	(a)	Explain the objective of river training work.	CO4	5
	(b)	Discuss the classification of river training work.		6
	(c)	Make a list of structures for river training work.		5
	(d)	Explain the behavior of three type of structures for river training work.		9