Ref. No. Ex/CE/PE/B/T/421D/2025

BACHELOR OF ENGINEERING IN CIVIL ENGINEERING EXAMINATION 2025

(Fourth Year, Second Semester)

WATER RESOURCES ENGINEERING IIE

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

SL No		*Attempt both the GROUPS A & B, separate answer scripts are not required for different GROUPS, rather use single script only, Assume suitable values for the parameters if not supplied*		Marks
		GROUP A (*Attempt any one out of two questions*)		
1	(a)	What is called braided river? Show by neat sketch. What are the probable reason for developing the braided river?	**CO2**	4+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**
2	(a)	Define River Morphology. What is the impact of River Morphology on River Dynamics?	**CO2**	3+7=**10**
	(b)	What is the impact of climate change on River morphology?		**8**
	(c)	Explain the anthropogenic activities on River Morphology.		**7**
		GROUP B (*Attempt all questions mandatory*)		
3	(a)	What has been suggested in Meyer-Peter's Formula (*1948*)? Explain in brief.	**CO1**	**5**
	(b)	What are the parameters on which the quantum of sediment movement depends? Explain in brief.		**5**
	(c)	Estimate the quantum of bed load in the canal which is carrying 25 cumecs with a bed load concentration of 40ppm by wait. The median grain diameter of the bed material may be taken as 0.30mm. Use, Lacey's Regime perimeter and Meyer-Peter's Formula (*1948*).		**15**
4	(a)	What is called river 'Bend' and 'River Meandering'? Explain their difference briefly with sketches	**CO3**	**5**
	(b)	Explain the causes of river meandering.		**5**
	(c)	What type of structure, as river training work, may be provided to avoid the meandering? Explain its working principle.		3+4= **7**
	(d)	Explain the meander indices.		**8**
5	(a)	Estimate the discharge of a particular location of a stream for the data tabulated below.	**CO4**	**15**

Gauge Distance from Initial Point at Bank of the Stream (M)	Depth, d (m)	Mean Velocity v (m/s)	Gauge Distance from Initial Point at Bank of the Stream (M)	Depth, d (m)	Mean Velocity v (m/s)
0	0.0	0.00	180	5.7	2.25
10	3.1	0.37	190	5.1	2.05
30	4.4	0.87	210	6.0	1.44
50	4.6	1.09	225	6.5	1.32
70	5.7	1.34	240	7.0	1.20
90	4.5	1.36	255	7.2	1.04
110	4.4	1.39	270	6.2	0.86
130	5.4	1.42	285	5.5	0.45
150	6.1	2.03	300	3.6	0.26
160	5.8	2.22	315	0.0	0.00

	(b)	Draw a rating curve, on an appropriate graph sheet, for the total discharge estimated above; assuming initial gauge reading as 4.8m, and the increment of water level is 0.25m/hr for 24 hours.		**10**