BACHELOR OF ENGINEERING IN CIVIL ENGINEERING EXAMINATION 2024
(Fourth Year, Second Semester)

WATER RESOURCES ENGINEERING IIE

Time: Three Hours   Full Marks: 100

SL No		*Attempt any FOUR questions.* *Assume suitable values for the parameters if not supplied*		Marks
1	(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
2	(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
3	(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
4	(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
5	(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
6	(a)	Estimate the discharge of a particular location of a stream for the data tabulated below.		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 4.0m, and the increment of water level is 0.2m/hr for 12 hours.		10