



PRESIDENCY UNIVERSITY

BENGALURU

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End - Term Examinations – May / June 2026

Date: 29- 05-2026

Time:09:30am – 12:30pm

School: SOE	Program: B.Tech	
Course Code : CIV2505	Course Name: Hydrology and Irrigation Systems	
Semester: IV	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	10	-	24	30	36

Instructions:

- Read all questions carefully and answer accordingly.
- Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	List any two scope of hydrology	2 Marks	L1	C01
2.	Define precipitation and list any two types of precipitation	2 Marks	L1	C01
3.	Name the three important losses from precipitation	2 Marks	L1	C01
4.	Define rain gauge and give one example for non –recording type rain gauge	2 Marks	L1	C01
5.	Define the following forms of precipitation a) Sleet b) Fog	2 Marks	L1	C01
6.	Define the following a) Base flow b) Surface run off	2 Marks	L1	C03
7.	Define Unit Hydrograph	2 Marks	L1	C03
8.	Define irrigation and list any two advantages of irrigation	2 Marks	L1	C05
9.	Define the following terms related to irrigation a) Duty b) Delta	2 Marks	L1	C05
10.	What is Perennial method of Irrigation	2 Marks	L1	C05

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Explain the below mentioned factors affecting Runoff Hydrograph. a) Shape of the basin b) Urbanization	10 Marks	L2	C03																																
	b.	Given below are the ordinates of a 6-h unit hydrograph for a catchment. Calculate the ordinates of the DRH due to a rainfall excess of 3.5 cm occurring in 6 h. <table><tr><td>Time (h)</td><td>0</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>69</td></tr><tr><td>UH ordinate (m³/s)</td><td>0</td><td>25</td><td>50</td><td>85</td><td>125</td><td>160</td><td>185</td><td>160</td><td>110</td><td>60</td><td>36</td><td>25</td><td>16</td><td>8</td><td>0</td></tr></table>	Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69	UH ordinate (m³/s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0	10 Marks	L3	C03
Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69																						
UH ordinate (m³/s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0																						
Or																																					
12.	a.	Explain the below mentioned factors affecting runoff hydrograph a) Physiographic factors b) Climatic factors	10 Marks	L2	C03																																
	b.	Two storms each of 6-h duration and having rainfall excess values 2.0 of and 3.0 cm respectively, occur successively. The 3 cm <i>ER</i> rain follows the 3 cm rain. The 6 h unit hydrograph for the catchment is given below. Calculate the resulting <i>DRH</i> . <table><tr><td>Time (h)</td><td>0</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>69</td></tr><tr><td>UH ordinate (m³/s)</td><td>0</td><td>20</td><td>40</td><td>80</td><td>120</td><td>160</td><td>180</td><td>160</td><td>110</td><td>60</td><td>40</td><td>20</td><td>15</td><td>8</td><td>0</td></tr></table>	Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69	UH ordinate (m³/s)	0	20	40	80	120	160	180	160	110	60	40	20	15	8	0	10 Marks	L3	C03
Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69																						
UH ordinate (m³/s)	0	20	40	80	120	160	180	160	110	60	40	20	15	8	0																						
Or																																					
13.		The ordinates of a 3-hour unit hydrograph for a catchment are given below. Determine the 9-hour unit hydrograph using the method of superposition <table><tr><td>Time (h)</td><td>0</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td></tr><tr><td>3-h UH</td><td>0</td><td>15</td><td>60</td><td>95</td><td>80</td><td>50</td><td>20</td><td>0</td></tr></table>	Time (h)	0	3	6	9	12	15	18	21	3-h UH	0	15	60	95	80	50	20	0	20 Marks	L3	C04														
Time (h)	0	3	6	9	12	15	18	21																													
3-h UH	0	15	60	95	80	50	20	0																													
Or																																					
14.		Given the ordinates of a 4-h unit hydrograph as below determine the ordinates of a 12-h unit hydrograph for the same catchment using S-Curve method. <table><tr><td>Time (h)</td><td>0</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td></tr><tr><td>Ordinate of 4-h UH</td><td>0</td><td>20</td><td>80</td><td>130</td><td>150</td><td>130</td><td>90</td><td>52</td><td>27</td><td>15</td><td>5</td><td>0</td></tr></table>	Time (h)	0	4	8	12	16	20	24	28	32	36	40	44	Ordinate of 4-h UH	0	20	80	130	150	130	90	52	27	15	5	0	20 Marks	L3	C04						
Time (h)	0	4	8	12	16	20	24	28	32	36	40	44																									
Ordinate of 4-h UH	0	20	80	130	150	130	90	52	27	15	5	0																									
15.	a.	Explain the classification of canal based on its surface. And also mention merits and demerits of lined and unlined canal	10 Marks	L2	C05																																

	b.	The peak discharge of a flood hydrograph due to a 4-h isolated storm is $320 \text{ m}^3/\text{s}$. Total rainfall = 6.5 cm. Average infiltration loss = 0.4 cm/h. Base flow = $25 \text{ m}^3/\text{s}$ (constant). a) Estimate the peak of the 4-h unit hydrograph. b) If the catchment area is 620 km^2 , determine the base width of the UH assuming it is triangular.	10 Marks	L3	C04
Or					
16.	a.	With the help of neat sketch explain classification of canal based on alignment	10 Marks	L2	C05
	b.	A 2-h duration storm produces a flood peak of $180 \text{ m}^3/\text{s}$. Total rainfall depth = 4.2 cm. Average loss rate = 0.5 cm/h. Constant base flow = $15 \text{ m}^3/\text{s}$. 1. Determine the effective rainfall. 2. Calculate the peak of the 2-h unit hydrograph. 3. If the catchment area is 350 km^2 , compute the base width assuming triangular UH.	10 Marks	L3	C04
17.	a.	Due to water logging productivity of land gets affected. Water logging can be also referred as saturation of soil with excess of water. Explain the causes and effects of water logging	10 Marks	L2	C05
	b.	Explain Basin and free flooding method of Irrigation method with the help of neat sketch.	10 Marks	L2	C05
Or					
18.	a.	Explain any five methods to control water logging in agricultural land	10 Marks	L2	C05
	b.	Explain drip Irrigation method and also mention two merits and demerits of drip Irrigation method	10 Marks	L2	C05