PVP 23

Code: 23CE3502

III B.Tech - I Semester - Regular Examinations - NOVEMBER 2025

ENGINEERING HYDROLOGY
(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Define Hydrologic cycle and write its applications.	L1	CO1
1.b)	List out different types of rain gauge networks.	L1	CO1
1.c)	Explain Evapotranspiration and controlling methods.	L1	CO2
1.d)	What is meant by infiltration capacity curve?	L1	CO2
1.e)	Explain the concept of Unit Hydrograph.	L1	CO3
1.f)	Define Synthetic Unit Hydrograph and Instantaneous Unit Hydrograph (IUH).	L1	CO3
1.g)	Define Standard Project Flood (SPF) and Probable Maximum Flood (PMF).	L1	CO4
1.h)	What are the flood control methods?	L1	CO4
1.i)	Differentiate between confined and unconfined aquifer.	L1	CO5
1.j)	List out the different types of wells.	L1	CO5

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Define the Hydrologic Cycle. Explain its components with a neat sketch.	L2	CO1	5 M
	b)	Explain the Non-Recording type of rain gauges and discuss their merits and demerits.	L2	CO1	5 M
OR					
3	a)	The normal annual rainfall at stations A, B, C and D in a basin are 70.97, 57.59, 86.28 and 89.01 cm respectively. In the year 1995, the station D was inoperative and the stations A, B and C recorded annual precipitation of 81.11, 92.23 and 89.89 cm respectively. Estimate the rainfall at station D in that year.	L2	CO1	5 M
	b)	Differentiate between Intensity Duration Frequency (IDF) and Depth Area Duration (DAD) curves.	L2	CO1	5 M
UNIT-II					
4	a)	Discuss the factors affecting evaporation and its control methods.	L2	CO2	5 M
	b)	Explain the initial abstraction and its importance in hydrological analysis.	L2	CO2	5 M
OR					

<table>
<tr><td rowspan="2">5</td><td>a)</td><td>Explain the different infiltration indices such as φ-index and W-index.</td><td>L2</td><td>CO2</td><td>5 M</td></tr>
<tr><td>b)</td><td>Determine the flood hydrograph from the unit hydrograph obtained due to a 3-hour storm. Total precipitation =20 cm, initial loss = 0.6, Ø-index=1cm/hr.
<table>
<tr><td>Time (hr)</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><td>24</td><td>27</td><td>30</td></tr>
<tr><td>Discharge (cumecs)</td><td>4</td><td>9</td><td>12</td><td>18</td><td>20</td><td>16</td><td>20</td><td>10</td><td>8</td><td>6</td><td>4</td></tr>
</table></td><td>L3</td><td>CO2</td><td>5 M</td></tr>
<tr><td colspan="6">UNIT-III</td></tr>
<tr><td rowspan="2">6</td><td>a)</td><td>Define Runoff and explain different factors effecting runoff.</td><td>L2</td><td>CO3</td><td>5 M</td></tr>
<tr><td>b)</td><td>Explain the terms:
i) Flow Mass Curve
ii) Flow Duration Curve</td><td>L2</td><td>CO3</td><td>5 M</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>7</td><td colspan="2">Explain the different components of a unit hydrograph with a neat sketch and write its merits and demerits.</td><td>L3</td><td>CO3</td><td>10 M</td></tr>
<tr><td colspan="6">UNIT-IV</td></tr>
<tr><td>8</td><td colspan="2">Define floods. Explain the causes and effects of floods with controlling methods.</td><td>L3</td><td>CO4</td><td>10 M</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>9</td><td colspan="2">For a data of maximum recorded annual floods of a river the mean and standard deviation are 5200 m^3 and 2705 m^3 respectively. Using Gumbel’s Extreme Value Distribution, estimate the return period of a design flood of 9700 m^3/s. Assume as infinite sample size.</td><td>L4</td><td>CO4</td><td>10 M</td></tr>
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UNIT-V					
10		Derive the expression for discharge in case of unconfined Aquifer with neat sketch.	L3	CO5	10 M
OR					
11	a)	Describe the Occurrence of ground water.	L2	CO5	5 M
	b)	Write the short notes on well construction and Open Well-Recuperation test.	L2	CO5	5 M