

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), Dec 2021
B. Tech Civil Engineering, Semester V

Roll No.....

Course Code: CE1213 Hydrology and Water
Resources Engineering

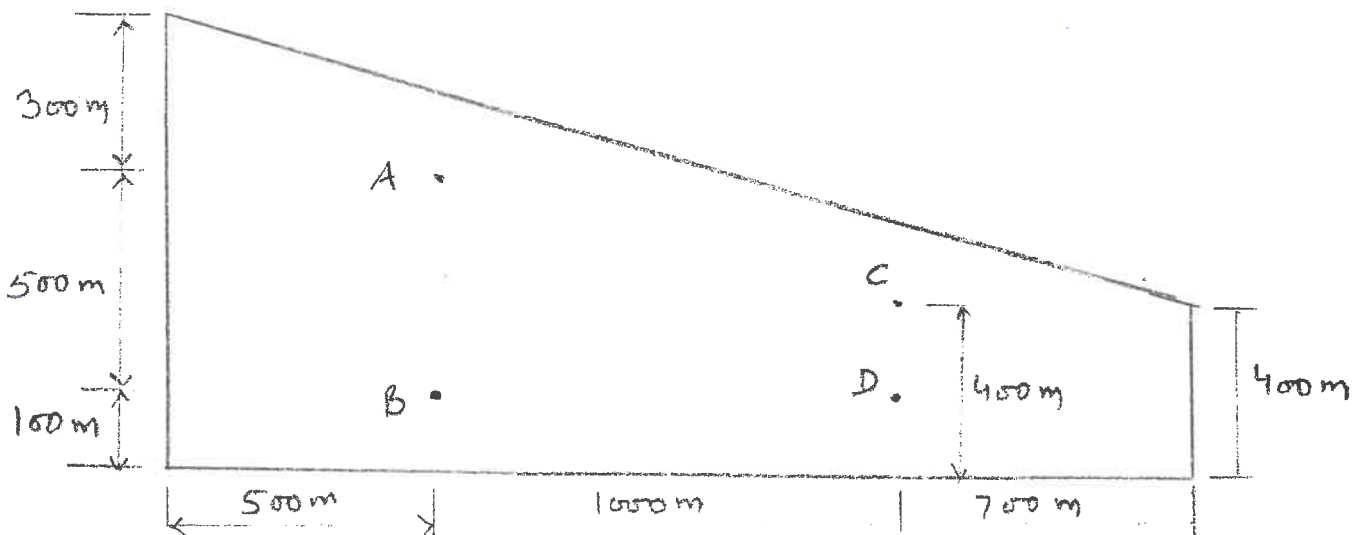
Time: 2 hours

Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q. 1 The location of 4 rain gauge stations in a catchment is given in Fig. 1. On a particular date rainfall at these stations is observed as 20 mm, 36mm, 42 mm and 19 mm respectively. Find the average rainfall for the catchment. (8)



Q. 2 The total catchment area of Mashri River is 2000 Sq km. For this catchment 2 Hr Unit hydrograph is given below. On 21 July 2021, the catchment area observed effective rainfall of 60 mm, 25 mm and 32 mm in three time spans of 2 hrs. Find the resultant direct runoff hydrograph reaches at the outlet point of the catchment. Also find the total volume of water. (8)

Time (hr)	0	2	4	6	8	10	12	14	16
4 hr UH (m^3/s)	0	13	25	32	30	27	24	21	18
Time (hr)	18	20	22	24	26	28	30	32	34
4 hr UH (m^3/s)	16	14	11.5	9.5	7.5	5.5	3.5	1.5	0

Q. 3 Table given below gives the details about the average seasonal discharges in a river for 16 years. The reservoir supplies the water in a canal system and drinking water scheme is such that it is required to maintain a flow of 600 cumecs throughout the year. Find the desired capacity of the reservoir to full fill the requirement. (10)

Year	16 th June to 30 Sept	1 oct – 31 March	1 April – 15th June
2001-2002	1000	350	50
2002-2003	3050	250	40
2003-2004	3500	400	30
2004-2005	2050	175	120
2005-2006	1200	375	65
2006-2007	1450	450	125
2007-2008	3700	155	125
2008-2009	700	210	80
2009-2010	875	150	90
2010-2011	2400	360	160
2011-2012	3300	295	90
2012-2013	2100	210	70
2013-2014	3500	155	125
2014-2015	700	400	80
2015-2016	875	150	180
2016-2017	1300	600	200

Q. 4 What is the difference between confined and unconfined aquifer? Draw a neat sketch and derive the expression for finding coefficient of permeability by pumping out test, (Write basic assumption of the derivation)

for Confined aquifer (4)