

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

1100CET307122103

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Examination December 2021 (2019 scheme)



Course Code: CET307

Course Name: HYDROLOGY & WATER RESOURCES ENGINEERING

Max. Marks: 100

Duration: 3 Hours

**PART A**

*(Answer all questions; each question carries 3 marks)*

		Marks
1.	What is a Mass curve?	3
2	A precipitation station X was inoperative .Precipitation recorded in three stations A,B,C surrounding station X were 6.2 ,4.7and3.5 cm respectively. Normal annual precipitation amounts to 64.3, 70.7 , 54.5 and 35. 3 cm for stations X,A, B and C. Estimate storm precipitation of X	3
3	Explain the Two line method of separation of base flow	3
4	A six hour storm rainfall with following rainfall depths occurs over a basin. 2.2, 3.5,5.4,10.2,4.8,3.1 and 6.2 cm. Surface runoff is 10.7 cm. Determine the average infiltration index	3
5	Define i) Field capacity ii ) Permanent wilting point	3
6	A field has an area of 50 ha. When 10 cumecs of water was supplied for 5 hours , 35 cm of water was stored in root zone.Find Field application efficiency	3
7	What is Surcharge storage and Bank storage in a reservoir?	3
8	Explain any one method of River stage measurement	3
9	Sketch a cavity type-tube well and label its parts	3
10	Define i) Specific yield ii ) Specific retention	3

**PART B**

*(Answer one full question from each module, each question carries 14 marks)*

**Module -1**

- 11 a) Explain the Thiessen Polygon method of computation of mean precipitation 6

- b) Plot a hyetograph using the following data

8

Time (am)	9.00	9.05	9.10	9.15	9.20	9.25	9.30
Accumulated Rainfall (mm)	0	2	6	12	15	17	20

- 12 a) Explain the field measurement of infiltration rate using Double ring infiltrometer 6  
 b) What are the different ways to control evaporation? Explain the measurement of evaporation using IMD pan . 8

### Module -2

- 13 a) What are the factors affecting Runoff? 6  
 b) Determine the ordinates of unit hydrograph from the following observed flows from a drainage area of 300 sq km of 3 hours duration . Assume a constant flow of 25 cumecs. 8

Time	Ordinates of storm hydrograph (cumecs)
0 am	25
3 am	110.3
6 am	150.6
9 am	139.8
12 noon	126
3 pm	100.3
6 pm	75.9
9 pm	48.5
0 am	25

- 14 a) What are the assumptions of Unit hydrograph theory ? 6  
 b) Explain the parts of a single peaked hydrograph . 8

**Module -3**

- 15 a) Determine the reservoir capacity for the following data if canal losses are 15 % and reservoir losses are 10% 6

Crop	Base period	Duty (hectare/cumecs)	Area under crop (ha)
Cotton	250	1200	2500
Wheat	130	1700	4000
Rice	115	850	3000
Vegetables	125	665	1000
Sugar cane	360	800	5000

- b) Explain the factors affecting duty and methods to improve duty 8
- 16 a) Define various Irrigation efficiencies 6
- b) Explain the different types of Irrigation 8

**Module -4**

- 17 a) Explain the types of reservoirs 6
- b) Explain the determination of reservoir capacity using Mass curve method 8
- 18 a) What is a Flow duration curve? Explain the procedure to construct the same 6
- b) Explain River Training works 8

**Module -5**

- 19 a) A well penetrates fully a 12m thick water bearing stratum of soil having coefficient of permeability of 0.007 m/s. The well radius is 11 cm and is to be worked under a drawdown of 5 m at the well face. Calculate discharge from the well. What will be the percentage increase in discharge if the radius of well is doubled? Radius of influence is 300 m in each case 6
- b) Explain Recuperation test for determining yield of open wells 8
- 20 a) Explain the zones of underground water 6
- b) A 35 cm diameter well penetrates 25 m below the water table. The water level in a test well at 80 m is lowered by 0.6 m after 24 hours of pumping at the rate of 6000 l/minute and in a well 35 m away, the drawdown is 1.2 m. Determine a) Transmissibility of the aquifer b) Drawdown in the main well 8

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