

**B**

06CE7123

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

Name \_\_\_\_\_

**A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

**M.TECH DEGREE EXAMINATION, DECEMBER 2016**

**THIRD SEMESTER**

**Branch: Civil Engineering**

**Environmental Hydrology**

**Time: 3 Hours**

**Max. Marks: 60**

**PART A**

*Answer ALL questions*

1. Explain the limitations of unit hydrograph.
2. Explain different types of saturated formations seen below the ground surface.
3. Write a note on infiltration galleries.
4. Illustrate upconing of saline water

**(4 x 5 marks =20 marks)**

**PART B**

5. What do you mean by infiltration? Explain different methods for the measurement and calculation of infiltration.

OR

6. How we can check the consistency of rainfall data from a station? The Annual rainfall of a station at Chennai and the annual rainfall of 5 surrounding stations are given below. Check the consistency of data at the given station. Correct the data if it is inconsistent

Year	Annual rainfall at Chennai	Annual rainfall at 5 surrounding stations	Year	Annual rainfall at Chennai	Annual rainfall at 5 surrounding stations
1989	1580	1260	1999	1250	1350
1990	1420	1270	2000	1120	1230
1991	1740	1410	2001	750	950
1992	1480	1350	2002	1280	1150
1993	1760	1320	2003	1220	1430
1994	1240	970	2004	1200	1150
1995	1400	1080	2005	1100	1230
1996	1760	1730	2006	1170	1100
1997	1210	1360	2007	1100	1260
1998	1380	1440	2008	1430	1410

7. a) Define hydraulic conductivity. How can you measure it. (5 marks)

b) Develop an equation relating the steady state discharge from a well in an unconfined aquifer and depth of water table at two known positions from the well. (5 marks)

OR

8. How can you estimate the confined aquifer parameters when a radial unsteady flow occurs in the aquifer for a pumping rate of  $Q \text{ m}^3/\text{s}$ .

9. Discuss different methods of drilling of dug wells.

OR

10. a) Explain well loss. Discuss different methods to determine well loss ( 5 marks)

b) What do you meant by specific capacity of a well? How it is determined? ( 5 marks)

11. What do you meant by geophysical exploration? Explain different techniques used for geophysical exploration.

OR

12. Explain different methods to recharge ground water.

**(4 x 10 marks =40 marks)**

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**A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY****M.TECH DEGREE EXAMINATION, DECEMBER 2017****THIRD SEMESTER****BRANCH: CIVIL ENGINEERING****Specialization: Environmental Engineering****ENVIRONMENTAL HYDROLOGY****Time: 3 Hours****Maximum Marks: 60****PART A***Answer ALL questions***(4 x 5 marks =20 marks)**

1. Briefly explain Horton's infiltration model.
2. Write a note on well function. How it is determined?
3. Illustrate infiltration galleries.
4. Explain different methods to control saline water intrusion in to ground water.

**PART B****(4 x 10 marks =40 marks)**

5. Explain different methods to measure precipitation in an area.

**OR**

6. Explain IUH with its applications. The ordinates of a IUH of a catchment are given below. Derive DRH for this catchment due to a storm of duration 4 hrs. and have rainfall excess of 5 cm.

Time (h)	0	1	2	3	4	5	6	7	8	9	10	11	12
Ordinates IUH (m <sup>3</sup> /s)	0	8	35	50	47	40	31	23	15	10	6	3	0

P.T.O.

7. a) Define specific yield and specific capacity of a well. How can you measure it? (5 marks)
- b) Develop an equation relating the steady state discharge from a well in an unconfined aquifer and depth of water table at two known positions from the well. (5 marks)

**OR**

8. How can you estimate confined aquifer parameters when a radial unsteady flow occurs in the aquifer for a pumping rate of  $Q \text{ m}^3/\text{s}$ ?

9. Briefly explain different techniques used for the construction of a well

**OR**

10. a) What are the factors considered in the design of a well? Explain. (5 marks)
- b) What are the different reasons for the failure of tube wells. (5 marks)

11. Discuss about the management of ground water basin for the effective utilization of sub surface water.

**OR**

12. The water table of a tube well in a particular area of our country is decreasing day by day. How can you enhance the sustainable yield from that well.

Exam Slot: B

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**A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**M.TECH DEGREE EXAMINATION, DECEMBER 2018**  
**THIRD SEMESTER**  
**ENVIRONMENTAL ENGINEERING**  
**Environmental Hydrology**

Time: 3 Hrs

Maximum Marks:60

**PART A**

*Answer ALL Questions*

1. How can you separate water loss and run off from the total precipitation represented as a hydrograph?
2. Write a short note on leaky aquifers.
3. Illustrate infiltration galleries and list its applications.
4. Explain briefly the impacts of ground water pollution.

4 x 5 marks = 20 marks

**PART B**

5. a) Briefly explain Hortons infiltration model.  
**4 marks**
- b) The ordinates of a 6 hr unit hydrograph are given. Using this derive the ordinates of a 3 hr unit hydrograph for the same catchment.

Time (h)	0	3	6	9	12	15	18	21	24	27	30	33
6 hr UH ordinates (m <sup>3</sup> /s)	0	8	20	43	80	110	130	146	150	142	130	112
Time (h)	36	39	42	45	48	51	54	57	60	63	66	
6 hr UH ordinates (m <sup>3</sup> /s)	90	70	52	38	27	20	15	10	5	2	0	

6 marks

OR

6. a) What do you mean by infiltration? Explain different methods for the measurement and calculation of infiltration.

**6 marks**

b) Write a note on DAD curves. What are the applications of DAD curve?

**4 marks**

7. a) Write a short note on multiple well system.

**4 marks**

b) The following are the observations made on a 300 mm diameter well penetrating an unconfined aquifer.  $Q = 1800$  lpm. Drawdown in the test well 30 m away = 1.8 m, draw down in the test well 60 m away = 0.6 m, depth of water in the well before pumping = 50m, determine R and T?

**6 marks**

OR

8. a) Briefly explain different properties of aquifer.

**4 marks**

b) How can you estimate the unconfined aquifer parameters when a radial unsteady flow occurs in the aquifer for a pumping rate of  $Q$ ?

**6 marks**

9. Write a short note on dug wells. Discuss different methods of drilling of dug wells.

**10 marks**

OR

10. Briefly explain different techniques used for the development of a well to increase the specific capacity and life of a well.

**10 marks**

11. Write a note on saline water intrusion in aquifers and its control measures. Explain Ghyben-Herzberg relation.

**10 marks**

OR

12. What do you mean by geophysical exploration? Explain different techniques used for geophysical exploration.

**10 marks**

**4 x 10 marks = 40 marks**