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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER M.TECH DEGREE EXAMINATION, APRIL 2018

**DEPARTMENT OF CIVIL ENGINEERING
ENVIRONMENTAL ENGINEERING**

**Course No:07 CE 6422 - GROUND WATER CONTAMINATION AND POLLUTION
TRANSPORT**

Time: 3 hours

Max. Marks: 60

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1a	Give the schematic representation of the hydrologic cycle. Prepare a note on "ground water and the hydrologic cycle"?	4
	Answer b or c	
b	Explain how hydraulic conductivity values show variations through space within a geologic formation.	5
c	Examine groundwater as a resource and a geotechnical problem..	5
Q.no.	Module 2	Marks
2a	Summarize the properties of the saturated and unsaturated zones ground water flow.	4
	Answer b or c	
b	Derive the expression for saturated transient flow of groundwater ?.	5
c	What is hydrodynamic dispersion? Explain its importance in groundwater flow?	5
Q.no.	Module 3	Marks
3a	Explain the subsurface geophysical investigation techniques of groundwater development?	4
	Answer b or c	
b	Examine the effect of multiple well system and partial penetration of wells in the drawdown in hydraulic head in confined aquifer.	5
c	Explain about artificial recharge and induced infiltration?	5

Module 4

Q.no.		Marks
4a	Explain the association and dissociation of dissolved species in ground water?	4
Answer b or c		
b	Prepare and explain a percent occurrence versus pH for inorganic carbon and inorganic phosphorus in water at 25°C	5
c	List out the index parameters of field investigation of ground water? Explain the methods for measurement of these?	5

Q.no.	Module 5	Marks
5a	Explain the geochemical interpretation of ^{14}C dates.	5
Answer b or c		
b	Examine how the chemistry of water evolves in various situations where ground water flows through rocks comprised of carbonate minerals.	7
c	Explain the various methods of land disposal of solid waste and sewage disposal on land. Discuss the advantages and disadvantages of each.	7

Q.no.	Module 6	Marks
6a	Explain the sources of ground water contamination? Discuss the various remedial measures for the control of contamination of ground water?	5
Answer b or c		
b	State and explain the various processes in solute transport in ground water?	7
c	What are the uses of modelling in ground water flow? Explain USGS-MOC model for ground water flow modelling?	7