Ref. No. Ex/CE/T/316(III)/2017(S)

B. CIVIL ENGG. 3rd YEAR 1st SEMESTER SUPPLEMENTARY EXAMINATION 2017
(1st Semester)

Ground Water Hydrology & Water Conservation

Time: Three Hours

Full Marks 100
(Part II: 60 Marks
Part I : 40 Marks)

Use a separate Answer-Script for each part

Question No.		Part I (40 Marks)	Marks
		*Answer **ANY TWO** questions from this Part.* *Assume reasonable values of data, if not supp;ied*	
Q.1	a)	An artesian aquifer 22m thick has a porosity of 20 % and is elastic modulus of compression is 10^8 N/m^2. Estimate Storage Co-efficient of the aquifer. What fraction of this is attributable to the expansibility of water? Deduce the formula you use.	5+10 =15
	b)	"Piezometric head is much higher than the top level of a confined aquifer"-Justify with a neat sketch	3
	c)	What can happen if the confining beds of the aquifer are aquitards?	2
Q,2	a)	Deduce the expression for confined groundwater flow between two waterbodies.	10
	b)	Define 'Specific yield', Specific retention and deduce the relationship among porosity and these two parameters. Also show their relationship with grainsize graphically.	2+2+24+2 =10
Q.3	a)	What is Barometric Efficiency and Tidal Efficiency? Establish their relationship.	5
	b)	Deduce Laplace's Equation for steady flow	10
	c)	Estimate the probable land subsidence when the piezometric head drops by 70 m in an artesian aquifer 30m thick, having a porosity of 30% and storage Co-efficient of $2x10^{-4}$.	5

Ref. No. Ex/CE/T/316(III)/2017(S)

BACHELOR OF CIVIL ENGINEERING EXAMINATION 2017

(Third Year; First Semester, Supplementary)

GROUND WATER HYDROLOGY AND WATER CONSERVATION

(Elective I)

Time: Three Hours

Full Marks 100
(Part I: 40 Marks
Part II: 60 Marks)

Use a separate Answer-Script for each part

Question No.		Part II (60 Marks)	Marks
		*Answer any **TWO** questions from this part. Assume suitable values for the parameters if not supplied.*	
1	(a)	What is water conservation? How it can be done?	2+3=5
	(b)	What are the parameters to be considered for water conservation? Explain them.	3+14=17
	(c)	Explain groundwater flow, considering unconfined aquifer and confined aquifer, with neat sketch.	2+6=8
2	(a)	Define Rainwater Harvesting. Why Rainwater Harvesting should be promoted?	2+3=5
	(b)	How can Rainwater Harvesting contribute to a sustainable water strategy?	10
	(c)	Make a list of different types of Rainwater Harvesting and explain briefly with sketches.	15
3	(a)	A 30 cm well completely penetrates an unconfined aquifer of saturated depth 40m. After a long period of pumping at a steady rate of 1500lpm, the drawdown in two observation wells 25 and 75m from the pumping well were found to be 3.5 and 2.0m respectively. Determine the transmissibility of the aquifer. Also determine the drawdown at the pumping well. Show the detail sketch.	15
	(b)	A well is located in a 25m confined aquifer of permeability 30m/day and storage coefficient 0.005. If the well is being pumped at the rate of 1750lpm, calculate the drawdown at a distance of 100m, and 50m from the well after 20 hours pumping	10
	(c)	Explain the well loss briefly with detail sketch.	5