B.Tech. SEM -VII (Civil) 2014 Course (CBCS) : SUMMER - 2019
SUBJECT: ELECTIVE – II : GROUND WATER HYDROLOGY

Day : Wednesday
Date : 15/05/2019

S-2019-2798

Time : 02.30 PM TO 05.30 PM
Max Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.
4) Use of non-programmable calculator is **ALLOWED**.
5) Assume suitable data, if necessary.

Q.1 Describe the Hydrological cycle with neat sketch and define all technical terms. **(10)**

OR

Discuss Ground Water Potential in India. Define the following terms: **(10)**

i) Aquifer
ii) Aquiclude
iii) Aquitard
iv) Aquifuge
v) Perched Aquifer

Q.2 With usual notations derive the following equation for ground water flow **(10)**

$$k_x \frac{\partial^2 h}{\partial x^2} + k_y \frac{\partial^2 h}{\partial y^2} + k_z \frac{\partial^2 h}{\partial z^2} = (\alpha + n\beta)\,\gamma \frac{\partial h}{\partial t}$$

OR

Describe the laboratory methods to determine the coefficient of permeability. **(10)**

Q.3 Derive the equation for the steady radial flow to well in an unconfined aquifer. **(10)**

OR

A well of radius 0.6 m penetrates completely a confined aquifer of thickness 40 m and permeability is 20 m/day. The well is pumped so that water level in the well remains at 7.5 m below the original piezometric surface. Assuming that the radius of influence is 500 m, compute the steady state discharge from the well. **(10)**

Q.4 List out the methods of installation of well screens and explain any two. **(10)**

OR

During a recuperation test conducted on an open well in a region, the water level in the well was depressed by 3 m and it was observed to rise by 1.50 m in 60 minutes **(10)**

i. What is the specific yield of open well in that region?
ii. What could be the yield from a well of 4 m diameter under a depression head of 2.5 m?
iii. What should be the diameter of the well to give a yield of 15 liters per second under a depression head of 2.2 m?

Q.5 What are the artificial recharge methods? Explain any one of them in detail. **(10)**

OR

Explain Well shrouding and Well Development. **(10)**

Q.6 What is sea water intrusion? Explain the methods to control sea water intrusion in ground water. **(10)**

OR

Describe the causes of Ground water pollution and methods to control it. **(10)**

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