

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech. Summer 2017 - 18 Examination

Semester: 2
Subject Code: 03214153
Subject Name: Ground Water Development & Management

Date: 23/05/2018
Time: 2:00pm to 4:30pm
Total Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

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- Q.1** (A) Classify tube well. Explain cavity well with neat sketch. (05)
(B) Explain Darcy's law. (05)
(C) An artesian aquifer 25 m thick has a porosity of 25% and bulk modulus of compression 10^8 N/m². Estimate the storage coefficient of the aquifer. What fraction of this is attribute to the expansibility of water. Take $\beta = 1 / 2.1 \times 10^9$, $\gamma_w = 9810$ (05)
- Q.2** Answer the following questions. (Attempt any three) (Each five mark) (15)
(A) Explain salinity ingress and its causes.
(B) From the flownet analysis of a well pumping at 150,000 lpm, the following data were obtained :
No. of flow channel = 4
Head drop between successive contours = 5.5 m
Thickness of aquifer = 30 m
Determine transmissibility and permeability of aquifer

(C) Define the following terms
i) Transmissivity (ii) specific yield (iii) storage coefficient (iv) porosity (v) permeability

(D) Explain various types of aquifers with neat sketch.
- Q.3** (A) Enlist ground water recharge methods. Explain percolation tank method and ditch and furrow method. (07)
(B) How to rehabilitate incrustated tube wells. (08)
- OR**
- (B) Discuss factors affecting selection of pump set. (08)
- Q.4** (A) Derive the equation of steady flow through unconfined aquifer. (07)
- OR**
- (A) Explain cable tool method of water well construction. (07)
(B) Water was pumped out from a well in a confined aquifer 25m thick, having a hydraulic conductivity of 1.5 m/day. The drawdown observed in the two adjoining wells at 15 m and 50 m from pumping well was 3m and 0.1m respectively. Find constant rate of pumping. (08)