END TERM EXAMINATION

EIGHTH SEMESTER [B.TECH] MAY-JUNE 2018

Paper Code: ETCE-412   Subject: Ground Water Assessment, Development and Management

(Batch 2013 Onwards)

Time: 3 Hours   Maximum Marks: 75

Note: Attempt five questions in all including Q no.1 which is compulsory. Select one question from each unit.

(5x5=25)

Q1   Attempt all the questions:-
(a) State Darcy's Law and its validity.
(b) Explain specific yield and specific retention.
(c) Write a short note on well loss and specific capacity of well.
(d) Discuss in detail the procedure of installation of jet pump.
(e) 600 m³/day of water is to be obtained from a proposed infiltration gallery, which is placed at 6m depth from the sub-surface water table. The co-efficient of permeability of soil aquifer is 100 m/day. Find the length of the gallery if the drawdown in the gallery on pumping is not to exceed 4m. The radius of influence may be assumed to be 100m.

UNIT-I

Q2   What are the various methods of ground water investigation? Explain in details.   (12.5)

Q3   (a) Write down the comparison between surface sources of water and ground water sources.   (5)
(b) Explain the various causes of ground water pollution.   (7.5)

UNIT-II

Q4   (a) During a recuperation test, the water level in an open well was depressed by pumping by 2.1 m and it recuperated 1.6m in 90 minutes. Find the diameter of well to yield 10 Ltr/sec under a depression head of 2m.   (5)
(b) A 30m diameter well completely penetrates the confined aquifer of permeability 45 m/day. The length of the strainer is 20m. Under a steady state of pumping the drawdown at the well was found to be 3m and radius of influence was 300m. Calculate the discharge.   (7.5)

Q5   (a) Design a tube well for following data:-   (7.5)

Yield Required	0.08 cumec
Thickness of Confined Aquifer	30 m
Radius of Influence	300 m
Permeability co-efficient (k)	60 m/day
Drawdown	5 m

(b) Design an open well in fine sand to give a discharge of 0.003 cumec when worked under a depression head of 2.5m.   (5)

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UNIT-III

Q6 What are the various types of screening used in tube wells? Explain with neat sketches. **(12.5)**

Q7 (a) Give classification of tube well as per boring methods. Also mention the procedure for each one. **(7.5)**

(b) Compare the Cable tool method and hydraulic rotary method of drilling. **(5)**

UNIT-IV

Q8 Design a tube well to deliver 33,000 gallons per hour at a depression head of 5m. The average water level is 10m below the ground in October and 15m in July. The geological investigation have yielded the following results at the site of boring:- **(12.5)**

Depth (m)	Type of Strata
0-5	Surface Clay
5-20	Very fine sand
20-30	Clay with Kankar
30-50	Coarse sand
50-60	Clay
60-70	Medium sand
Below 70	Clay with hard strata

Q9 What are the different types of pump which can be used for lifting the water? Explain with neat and suitable diagrams. **(12.5)**

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