Printed Pages : **EAG-603**

(Following Paper ID and Roll No. to be filled in your Answer Books)										
PAPER ID :	**Roll No.**									

B.TECH.
Theory Examination (Semester-VI) 2015-16
GROUND WATER, WELL & PUMP ENGINEERING

Time : 3 Hours ***Max. Marks : 100***

SECTION – A

1. Attempt **all** short answer type questions : **2 × 10 = 20**

(a) Define Aquifer. What are their types ?
(b) List the ground water exploration techniques.
(c) For what purposes a well screen is used ?
(d) What do you understand by well Log ? Why it is prepared ?
(e) Define the well interference. Sketch simple figure.
(f) Write short note on artificial ground water recharge.
(g) List any eight water lifting devices.
(h) What do you understand by priming of a pump ?
(i) On which principle a hydraulic ram works ? Write any two benefits of hydraulic Ram.
(j) Classify pumps and their performance curves.

SECTION – B

2. Attempt any **three** parts of the following: **10 × 5 = 50**

(a) Establish an expression for steady state flow to wells in a confined aquifer.
(b) Describe the principle and working of centrifugal pump. How will you select the appropriate size of a pump?
(c) What are the common types of bone-wells popular in the State? Describe in detail.
(d) What are the parameters included in the design of tube wells? How are the diameters of different section of a deep tube well decided?
(e) Why is the selection of a pump important? With the help of characteristics curves explain the selection of variable speed centrifugal pumps.
(f) What are the common types of pump troubles and their remedial measures?
(g) Write short notes on :
  (i) Mixed flow pump
  (ii) Chow's method of aquifer characteristics
(h) What do you understand by the development of a well ? Describe very common method practiced in Northern India.

SECTION – C

Attempt **all** questions : **15 × 2 = 30**

3. Two observation wells which are located in a confined aquifer at distances of 160 m and 90 m from the discharge well showed a drawdown of 3 m and 5 m respectively. If the thickness of confined water bearing strata is 10 m and water is being pumped at the rate of 30 m^3 /day. Calculate the hydraulic conductivity of aquifer.

4. What are the main differences between shallow and deep tube wells? Calculate the discharge from a fully penetrating confined well of 350 mm diameter if the thickness of aquifer is 25 m, drawdown is 6 m, permeability of aquifer is 20 mm/min and radius of influence is 550 metre ?

5. Write short notes on the following :
(i) Discuss the theory flow through air lift pump and explain the advantages and disadvantages.
(ii) Ground water project formulation