FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BTech (GEOLOGY), 2015/2016 SESSION

COURSE: GEL 412 (HYDROGEOLOGY)   UNIT: 3

DATE: 11th April, 2016   TIME ALLOWED: 2½ Hours

Instructions: This paper has two sections. Answer two questions from each.

SECTION A

1. Using diagrams write short notes on the following:
   - (i)   Vadoze zone
   - (ii)   Phreatic zone
   - (iii) Capillary fringe
   - (iv)   Hydraulic properties of rocks.

2. a. What are the factors affecting groundwater occurrence?
   b. Briefly explain Darcy's law and hydraulic conductivity

3. A soil has water content of 15% and a bulk density of $20.1 kN/m^3$ and partially dries to a density of $19.4 KN/m^3$. What is the water content of that soil while the void ratio remains constant?

SECTION B

1. Discuss groundwater composition under the following:
   - (a) Physical.
   - (b) Chemical.
   - (c) Bacteriological.

2. Write brief notes on any three of the following:
   - (a) Water resources inventory.
   - (b) Factors that influence the pH of water.
   - (c) Factor influencing groundwater chemistry.
   - (d) Groundwater analysis.

3. Explain presentation of results for groundwater chemical analysis under the following:
   - (a) Units of measurement.
   - (b) Pie chart.
   - (c) Collins diagram.
   - (d) Stiff diagrams.
   - (e) Piper diagram.
   - (f) Fence diagram.