Code No:**R42013**   **R10**   Set No. 1

IV B.Tech II Semester Regular Examinations, April/May - 2014
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
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1 a) What is an aquifer? Discuss different type of aquifers with their features. [7]

   b) Explain the ground water movement in aquifers. Define permeability and Darcy's law and discuss the. [8]

2 How do you analyze unsteady flow towards a well either in confined or unconfined aquifer? Discuss any one solution method. [15]

3 a) Discuss any two methods of surface investigation for ground water , in detail [7]

   b) Explain important features of aerial photogrammetry in ground water exploration. [8]

4 a) Find diameter of a tube well made in confined aquifer for the following details.
   - i).   Yield required = $0.10 \ m^3/s$
   - ii). Radius of circle of influence = 200 m
   - iii). Coefficient of permeability = 60 m/day
   - iv). Drawdown = 6m
   - v).   Thickness of aquifer = 30m. [10]

   b) What is infiltration gallery? Explain in detail [5]

5 a) List the tube well drilling method and discuss them [7]

   b) How do you develop a tube well after its construction? [8]

6 a) Why do we recharge ground water artificially? Explain the significance [5]

   b) Explain the following methods of artificial recharge of ground water
   (i) Recharge mounds
   (ii) Induced recharge
   (iii) Ditch and furrow recharge [10]

7 a) What are the implications of saline water intrusion in aquifers? [7]

   b) How do you measure and estimate the extent of saline water intrusion in aquifers? [8]

8 a) What are the elements and features of a typical ground water basin management plan? Explain the roles of different stake holders. [7]

   b) What is conjunctive use? Explain its importance in ground water basin management plan? [8]

Code No:**R42013**   **R10**   Set No. **2**

IV B.Tech II Semester Regular Examinations, April/May - 2014
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time : 3 hours   Max. Marks: 75
Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are different types of aquifers? Draw neat sketches and explain   [7]
   b) Define and discuss the following
           (i) Darcy's law   (ii) Storage Coefficient   (iii) Transmissivity   [8]

2   What are leaky aquifers?
       State Non equilibrium equation for unsteady flow towards a well and discuss
       Jocob's and Chow's simplifications   [15]

3 a) What are sub surface investigation methods of ground water? Discuss them in
       detail   [7]
   b) Briefly discuss the merits and demerits of surface and subsurface investigations
       of ground water.   [8]

4 a) Find the diameter of tube well made in a confined aquifer for the following
       data
       Yield from the well =0.2 cubic m /sec
       Radius of Influence =250m
       Coefficient of Permeability= 56m/day
       Drawdown=5m
       Thickness of aquifer=25m   [10]
   b) Explain the features of a well design   [5]

5 a) What are the methods of tube well construction?   [7]
   b) Discuss how you will develop a tube well by surging , jetting of water and back
       washing   [8]

6 a) Why is it necessary to recharge ground water?   [7]
   b) List out artificial recharge methods of ground water and discuss any two of
       them in detail   [8]

7 a) How does saline water intrude in aquifers?
       State and derive Ghyben Herzberg relation to study and measure saline water
       intrusion in aquifers.   [10]
   b) What are the measures to control sea water intrusion   [5]

8 a) What is the importance of conjunctive use in water resources planning   [7]
   b) Discuss in length any case study of Groundwater basin management   [8]

Code No:**R42013**

R10

Set No. 3

IV B.Tech II Semester Regular Examinations, April/May - 2014
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time : 3 hours   Max. Marks: 75

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What is permeability? Define Darcy's law and discuss the same.   [7]
   b) Derive differential equation governing ground water flow in three dimensions   [8]

2   When is the flow towards a well unsteady? Derive the required equation for
      unsteady flow towards a well. State the assumptions   [15]

3 a) Explain the detailed procedure of Electrical resistivity method to investigate
      for the occurrence of ground water   [8]
   b) What are the uses of aerial photogrammety in groundwater explorations?   [7]

4 a) Estimate the radius of a tube well made in confined aquifer for the following
      details.
      i).   Rate of flow required from well = 0.50 m^3/s
      ii).   Radius of circle of influence = 600 m
      iii). Coefficient of permeability = 36 m/day
      iv).   Drawdown = 8.2m
      v).   Thickness of   confined aquifer = 45m.   [10]
   b) What are well screens? How do you decide length and slot size   [5]

5 a) Explain the following methods of drilling a bore well
      i).   Hydraulic rotary method
      ii).   Reverse rotary method
      iii). Percussion method   [8]
   b) How do you disinfect a well after its development? What are the features of
      well maintenance?   [7]

6 a) What is artificial recharge of ground water? How do you decide sites for
      artificial recharge of ground water ?   [7]
   b) What are the methods of artificial recharge of ground water?   [8]

7 a) State and explain Ghyben – Herzberg relation to measure saline water
      intrusion in aquifers   [7]
   b) What are the causes of saline water intrusion in aquifers and what are the
      control measures?   [8]

8 a) What are the elements of groundwater basin management? How do you
      compare the same with watershed management?   [8]
   b) How is conjunctive use incorporated in ground basin management plan?   [7]

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Code No:**R42013**   **R10**   Set No. 4

IV B.Tech II Semester Regular Examinations, April/May - 2014
GROUND WATER DEVELOPMENT AND MANAGEMENT
(Civil Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What is the significance of specific yield, porosity, and specific retention in the ground water study.   [7]
   b) Define storage coefficient and transmissivity. Explain how they describe ground water movement.   [8]

2 Derive non equilibrium equation for unsteady flow towards a well. Discuss Theis method of finding solution for the equation.   [15]

3 a) Explain in detail the following to explore ground water occurrence
      i).   Seismic Refraction method
      ii). Geophysical logging   [8]
   b) List out the advantages and disadvantages of surface and sub surface methods of investigation for ground water.   [7]

4 a) A well is to be drilled in a confined aquifer. Find its radius if the field data is given below.
      Discharge from the well =0.6 cubic m /sec
      Radius of zero draw down = 400 m
      Coefficient of Permeability= 85 m/day
      Drawdown= 8 m
      Thickness of aquifer= 40m   [10]
   b) What is collector well? Define infiltration gallery   [5]

5 a) Explain how well screens are installed as part of tube well construction   [7]
   b) Discuss the methods of well development and disinfection   [8]

6 a) What is artificial recharge of ground water? What are the imperatives to resort to artificial recharge of ground water?   [7]
   b) Discuss the methods of ground water recharge.   [8]

7 a) What are the consequences of saline water intrusion? Explain the use of Ghyben-Herzberg relation.   [7]
   b) Discuss any two methods of controlling saline water intrusion.   [8]

8 a) What are the features of a typical ground water basin management plan ?   [8]
   b) Discuss the significance of conjunctive use in the management of a ground water basin.   [7]