

**B.Tech. Civil (Water Resources  
Engineering)****Term-End Examination****December, 2012****ET-532(B) : GROUND WATER DEVELOPMENT***Time : 3 hours**Maximum Marks : 70*

**Note :** Answer *any five* questions. All questions carry *equal* marks. Answer in your own language. Neat and labeled sketches should be given.

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1. (a) Define porosity of soil ; and give sketches explaining intergranular and other openings due to solution of limestones. 7
  - (b) Explain the concepts of specific yield, and specific retention giving sketches : Bring out the importance of these concepts in practical engineering. 7
  2. (a) Sketch out a confined aquifer, and explain its features. 8
  - (b) Why does water flow out of a well when its mouth is below a certain surface ? Name this surface. 6

3.    (a)    An aquifer yields  $1\text{m}^3/\text{day}/\text{m}^2$  through its mass. The thickness of the aquifer is 50m, and the hydraulic gradient is  $(10)^{-3}$ . Determine the transmissivity of the mass. 6  
  
      (b)    What do we understand by flow lines, and a flow tube ? 4  
  
      (c)    What is meant by ground water potential in an aquifer ? 4
  
4.    Discuss the basic mechanics of the following situations : 9, 5  
  
      (a)    Land slides  
  
      (b)    Land subsidence  
  
            Give sketches also.
  
5.    (a)    What is understood by a well inventory ? 5  
  
      (b)    Discuss the procedure to prepare a well inventory. 9
  
6.    Describe the following, giving detailed sketches : 8, 6  
  
      (a)    A vertical section of a dugwell in ordinary soil; and  
  
      (b)    A vertical section of a dugwell in a hard soil mass.

7. (a) Bring out the role of the following in weathering of rocks : 7
- (i) Hydrolysis
  - (ii) carbonation
  - (iii) hydration
  - (iv) solution
  - (v) oxidation
- (b) Outline the role of man-made factors influencing the composition of ground water. 7
8. With regard to the management of a water-shed, discuss the following : 5, 5, 4
- (a) abstraction of water
  - (b) cropping pattern
  - (c) conjunctive use of ground and surface waters.
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