

**B.Tech. Civil (Water Resources Engineering)**

**Term-End Examination**

**June, 2017**

00315

**ET-532(B) : GROUND WATER DEVELOPMENT**

*Time : 3 hours*

*Maximum Marks : 70*

**Note :** Answer any **five** questions. All questions carry equal marks. Well-labelled sketch shall carry due weightage.

1. Explain with neat sketches, the characteristic features of the following types of aquifers :  $4 \times 3 \frac{1}{2} = 14$
- (a) Unconfined aquifer
  - (b) Perched aquifer
  - (c) Artesian aquifer
  - (d) Leaky aquifer
2. (a) Describe storativity and transmissivity. Explain how transmissivity is determined. 6
- (b) Differentiate between the following :
- (i) Specific yield and Specific retention 2
  - (ii) Laminar and Turbulent flow 2
  - (iii) Effective stress and Pore pressure 2
  - (iv) Transmissivity and Hydraulic conductivity 2

3. (a) Describe the various factors affecting the hydrological properties of unconsolidated sediments. 7
- (b) Enlist the major types of consolidated sedimentary rocks and discuss their hydrological aquifer properties. 7
4. (a) Explain how overdraft of ground water induces land subsidence. 6
- (b) Discuss the following :
- (i) Salination of soils 3
- (ii) Causes of the failure of dams 3
- (iii) Impact of ground water in tunnelling 2
5. (a) Explain the electrical resistivity method of ground water investigation. What are the advantages of this method ? 8
- (b) Discuss the significance of the following in drainage basin analysis through toposheet :
- (i) Stream Orders 2
- (ii) Bifurcation Ratio 2
- (iii) Hypsometric Analysis 2
6. (a) Describe with the help of a neat sketch, the infiltration capacity curve and discuss its equation suggested by Horton. 7
- (b) Describe various components of ground water discharge. Explain how discharge components are calculated. 7

7. (a) Explain the purpose and objective of the Global Environment Monitoring System of United Nations Environment Programme (UNEP). 4
- (b) What are the different man-made factors responsible for ground water pollution? 4
- (c) Enlist the major chemical constituents present in ground water. What are the causes of abnormally high concentration of chloride in ground water? 6
8. Write short notes on the following :  $4 \times 3 \frac{1}{2} = 14$
- (a) Flow Net
- (b) Turbidity of Water
- (c) Reynolds Number
- (d) Thiessen Polygon Method
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