

B.Tech. Civil (Water Resources Engineering)

Term-End Examination

December, 2015

00551

ET-531(B) : SOIL SCIENCE

Time : 3 hours

Maximum Marks : 70

Note : Answer any *five* questions. All questions carry equal marks.

1. (a) Discuss rock weathering. Explain the process of soil formation. 7
- (b) Describe primary and secondary minerals and their role in soil formation. 7
2. (a) Discuss soil thermal properties and the factors determining the thermal regime of soil. State how soil temperature affects plant growth. 4
- (b) Differentiate between porosity and void ratio. How is porosity of the soil calculated? Calculate the void ratio if the porosity is 0.4. 6
- (c) Explain the different methods of measurement of soil moisture. Also give their merits and demerits. 4

3. (a) Describe Darcy's law. Discuss the applicability of this law to the vertical fluid flow in soil. 5
- (b) Describe the factors responsible for creating acidity in soil. Explain the effects of soil acidity on plants. Differentiate between active and reserve acidity. 9
4. (a) Discuss the four major physiographic divisions of India. Give a detailed account of climatic condition, natural vegetation and geology of these divisions. 7
- (b) Describing the characteristics of black cotton soil, distinguish between black cotton soil, laterite and lateritic soil. 7
5. (a) What are the different plant nutrients ? How are they classified ? Discuss the nutrient uptake and availability in soil. 7
- (b) Write an essay on the use of manures and fertilizers to improve the fertility of the soil. 7
6. (a) What are the different soil classification systems ? Explain American (USDA) system of soil classification. 7
- (b) Define Epipedons. Give a detailed account of the prominent diagnostic subsurface horizons. 7

7. (a) Describe the different macro and micro fauna inhabiting the soil, which play an active role in decomposition of the plant tissues. 7
- (b) Describe the various types of diseases that affect plants. Explain the symptoms of the plant diseases. 7
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