

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2453 Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

RURAL WATER SUPPLY AND SANITATION

Time : 3 Hours

Total Marks : 100

Note :—Attempt *all* questions.

1. Attempt any *four* parts of the following :— (5×4)
 - (i) Discuss the relationship between socio-economic development of society and sanitation.
 - (ii) Mention various aspects involved in environmental sanitation. Also give brief description.
 - (iii) Discuss various priorities involved in environmental sanitation.
 - (iv) What is water-related infection ? Discuss various transmission routes for it.
 - (v) What are health effects of toxic chemicals in drinking water ?
 - (vi) Discuss the role of W.H.O. in rural sanitation of India.
2. Attempt any *four* parts of the following :— (5×4)
 - (i) How will you estimate the water requirement of a village while planning a water supply scheme for rural areas ?
 - (ii) Discuss the quality and quantity aspects of water for spring and shallow driven wells.

- (iii) Why rain water harvesting must be necessary for rural area of India ? Discuss.
- (iv) What are infiltration galleries and infiltration wells ? Explain both with neat sketches.
- (v) Differentiate between 'shallow' and 'deep' wells. Define and explain the importance of cavity formation in such wells.
- (vi) What are major sources of water in rural area of eastern Uttar Pradesh ? Discuss various types of treatment if required.

3. Attempt any *two* parts of the following :— (2×10)

- (i) Discuss health effect of high fluoride concentration in water. What is Nalgonda Technique for defluoridation ? Discuss in detail.
- (ii) How will you remove excess iron from drinking water in rural area ?
- (iii) What are methods for disinfection of water in rural community supply ?

Assume that total chlorine dose of 3 mg/l is required to treat the raw bore water and bleaching powder contains 30% chlorine, compute the quantity of bleaching powder that you will dissolve in the doser tank of 70 litres capacity, which supplies chlorine stock solution to raw water in the ratio of 1 L to 100 L in the contact tank.

4. Attempt any *two* parts of the following :— (2×10)

- (i) Discuss adaptability and affordability of various community latrines for rural areas.

- (ii) What is ventilated improved latrines ? Discuss its vent pipe, super structure, multiple compartments design.
- (iii) What is soak pit and septic tank ? Draw neat sketch of its. Also discuss advantages and disadvantages of Imhoff tank, septic tank and stabilization pond.

5. Attempt any *four* parts of the following :— (5×4)

- (i) Write down the typical value of various parameters of solid waste from a rural area.
- (ii) What are various operational problems of biogas plants in rural areas ?
- (iii) Is it feasible to incinerate the solid waste in rural area of India ? Justify your answer.
- (iv) What are various methods of aerobic composting ?
- (v) Which types of waste should be disposed off landfills ? What are effects of disposing the organic waste in landfill ?
- (vi) List various problems in implementation of sanitation scheme in India.