

# JK LAKSHMIPAT UNIVERSITY, JAIPUR

## INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), Nov 2018

B. Tech Civil Engineering, Semester VI

Roll No.....

CE623 Rural Water Supply and Sanitation

Time: 3 hours

Max. Marks: 100

### Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

|       |                                                                                                                                                                                                                                                                                                     |    |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Q.1A  | Objective type multiple choice questions (10 questions @ 1 mark)                                                                                                                                                                                                                                    | 10 |
| i.    | The chlorine demand of a water sample was found to be 0.5 mg/liter. The amount of bleaching powder containing 30% available chlorine to be added to treat one liter of such a water sample is (a) 1.67 (b) 1.92 (c) 1.01 (d) 1.36                                                                   |    |
| ii.   | The most common cause of acidity in water is (a) Carbon dioxide (b) Oxygen (c) Hydrogen (d) Nitrogen                                                                                                                                                                                                |    |
| iii.  | If the diameter of the main pipe is taken less than economic diameter, then [1. Head loss will be high, 2. Cost of pipe will be less, 3. Cost of pumping will be less] which statement is correct (a) only 1 is correct (b) 1 and 2 are correct (c) 1, 2, and 3 are correct (d) 1 and 3 are correct |    |
| iv.   | The water supply to a house begins with the connection of the service pipe with the water mains. The connection comprises [1. Stop cock, 2. Goose neck, 3. Ferrule, 4. Water meter] the correct sequence of these connections is (a) 1, 2, 3, 4 (b) 3, 1, 2, 4 (c) 3, 2, 1, 4 (d) 1, 2, 4, 3        |    |
| v.    | The type of valve which is provided to control the flow of water in the distribution system at street corners and where the pipe intersect is (a) check valve (b) sluice valve (c) safety valve (d) scour valve                                                                                     |    |
| vi.   | A rural water treatment plant treats 6000 m <sup>3</sup> of water daily. If it consumes 20kg chlorine per day, then chlorine dosage would be (a) 2.33 mg/liter (b) 5.00 mg/liter (c) 4.00 mg/liter (d) 3.33 mg/liter                                                                                |    |
| vii.  | The polluted water is one which (a) contains pathogenic bacteria (b) consists of undesirable substances rendering it unfit for drinking and domestic use (c) is contaminated (d) is safe for domestic use                                                                                           |    |
| viii. | Following is not the material required for composting (a) Night soil (b) Fly ash (c) Street refuse (d) cow dung                                                                                                                                                                                     |    |
| ix.   | In hilly area ..... method is most suitable for landfill. (a) Area Method (above ground level) (b) Depression (c) Slope (d) Ramp                                                                                                                                                                    |    |
| x.    | Incineration is more suitable process of waste disposal when the amount of waste is less. (a) True (b) False                                                                                                                                                                                        |    |
| Q.2   | Short answer type questions (4 questions @ 2.5 marks)                                                                                                                                                                                                                                               | 10 |

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|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| i.   | Write a short note on types and quantity of water demands for rural water supply system. Justify your answer.                                                                                                                                                                                                                                                                                    |    |
| ii.  | What are the various parameters to checking the quality of waste water?                                                                                                                                                                                                                                                                                                                          |    |
| iii. | Composting is one of the methods of solid waste management. Still it is required to design the landfills. Why?                                                                                                                                                                                                                                                                                   |    |
| iv.  | Discuss the functioning of clarification process for water supply system.                                                                                                                                                                                                                                                                                                                        |    |
| Q.3A | Using EPANET-2 software, how will you create a rural water-supply distribution network for a rural community in Rajasthan?                                                                                                                                                                                                                                                                       | 05 |
| Q.3B | What are effects of Bisalpur drinking water project on the water-supply schemes in the rural areas of Jaipur? Elaborate your answer in detail.                                                                                                                                                                                                                                                   | 05 |
| Q.4A | Distinguish between water treatment and waste-water treatment processes. Describe the working of steps which are different water and wastewater treatment cases.                                                                                                                                                                                                                                 | 05 |
| Q.4B | UN World Health Organization (WHO) in their studies found large health effects of safe drinking water. Substantiate above hypothesis with a case example.                                                                                                                                                                                                                                        | 05 |
| Q.5A | Describe in detail the various parts of septic tank with neat sketch. Why septic tank is not common in Jaipur and nearby area?                                                                                                                                                                                                                                                                   | 05 |
| Q.5B | Describe in detail the population loading, hydraulic loading and organic loading.                                                                                                                                                                                                                                                                                                                | 05 |
| Q.6A | Describe in detail the various techniques for solid waste disposal.                                                                                                                                                                                                                                                                                                                              | 05 |
| Q.6B | Describe any four organisms in detail involve in composting.                                                                                                                                                                                                                                                                                                                                     | 05 |
| Q.7A | What is composting and what are the benefits of compost?                                                                                                                                                                                                                                                                                                                                         | 05 |
| Q.7B | In list various criteria for site selection for Landfill? Discuss at-least five criteria in detail.                                                                                                                                                                                                                                                                                              | 05 |
| Q.8A | Describe major steps involved in design of drinking water-supply treatment and distribution network for a rural area. The background data is as: Number of inhabitants 2,000 people, Individual water demand 40 lpcd, plant operation duration 6 hours/day, over-head storage capacity of 20000 liters, unlimited quantity of water available at source, and having a 3-phase 240V power supply. | 15 |
| Q.9  | Describe in detail Indore, Bangalore NADEP, Coimbatore method of composting.                                                                                                                                                                                                                                                                                                                     | 15 |