ET-507(A)

B.Tech. Civil (Construction Management) /
B.Tech. Civil (Water Resources Engineering)

Term-End Examination

December, 2017

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ET-507(A) : POLLUTANTS AND WATER
SUPPLY

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer six questions in all. Question number 1 is*
compulsory. Use of calculator is permitted.

1. (a) Which of the following is a secondary
       pollutant ?

   (i)   Sulphur dioxide

   (ii) Carbon monoxide

   (iii) Hydrocarbons

   (iv) Ozone

   (b) Electrostatic precipitators remove

   (i)   Sulphur dioxide

   (ii) Particulate matter

   (iii) Both (i) and (ii)

   (iv) None of these

(c) The ratio of the maximum daily water consumption to average daily consumption, is

(i) 1·0

(ii) 1·2

(iii) 1·6

(iv) 1·8

(d) The process of passing the water through beds of granular material is called

(i) Screening

(ii) Sedimentation

(iii) Filtration

(iv) Disinfection

(e) A sluice valve is also known as

(i) Air-inlet valve

(ii) Scour valve

(iii) Gate valve

(iv) None of these

(f) If W is the weight of water per cubic metre, Q is the discharge in m^3/sec and H is the total head, the required water horsepower of the pump is

(i) W Q H / 75

(ii) W Q H / 360

(iii) W Q H / 220

(iv) W Q H / 550

(g) Chemical coagulation of drinking water is done

    (i) To settle suspended materials

    (ii) To increase rate of settlement of suspended materials

    (iii) To remove bacteria

    (iv) None of these

(h) Rate of flow from a well per unit drawdown is known as its

    (i) Specific yield

    (ii) Specific capacity

    (iii) Field capacity

    (iv) None of these

(i) The most commonly adopted pumps in water supplies are

    (i) Centrifugal pumps

    (ii) Reciprocating pumps

    (iii) Hydraulic rams

    (iv) None of these

(j) The suitable layout for a water supply distribution system for an irregular grown town is

    (i) Dead end system

    (ii) Grid iron system

    (iii) Ring system

    (iv) Radial system   *10×1=10*

2. (a) What is Greenhouse Effect ? Discuss its undesirable consequences. *6*

(b) Name the control devices commonly used for the removal of gaseous pollutants. With the help of a suitable diagram, describe the working of any one of them. *6*

3. (a) Recovery and recycling of solid waste plays a key role in the solid waste management system. Discuss. *5*

(b) What is Biochemical Oxygen Demand (BOD) ? With the help of a typical BOD curve, distinguish between ultimate BOD and BOD remaining at any time t. *7*

4. (a) Name the tests commonly used for the determination of microbiological quality of water and discuss any one of the tests. *6*

(b) Laboratory analysis of a water sample indicated an ultimate BOD of 750 mg/lit and rate constant of 0·20/d at 20°C. Calculate the 5-day BOD at 20°C and at 30°C. *6*

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5. (a) What is a River Intake ? Discuss the factors that govern the location of an intake. *6*

(b) Derive an expression for the determination of discharge of an unconfined aquifer. *6*

6. (a) What are the characteristics of an ideal settling basin ? Prove that 'area' and 'overflow rate' rather than the 'detention period', govern the design of a settling tank. *6*

(b) Discuss the importance of Jar test. *6*

7. With the help of a neat sketch, describe the working of a Rapid Gravity Filter. Compare its working with a slow sand filter in terms of the following parameters : *12*

(a) Rate of filtration

(b) Size of the bed

(c) Method of cleaning

8. (a) Discuss the advantages and disadvantages of zeolite softeners. *6*

(b) What is an Equivalent Pipe ? How would you find the equivalent size of a compound pipe ? *6*

9. Write short notes on any *four* of the following : 4×3=12

(a) Hazardous Wastes

(b) Waterborne Disease

(c) Infiltration Galleries

(d) Break-point Chlorination

(e) Spigot and Socket Joint

(f) Desalination of Water

(g) Incineration

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