University of Mumbai

Civil Engineering Examination

Sub: CEC504/ Environmental Engineering-I **Year/Sem:- TE/ V Sem**
Max. Marks: 80 **Duration: - 2Hrs**

Q1. Attempt all the MCQS **(20 X 2 mark= 40 marks)**

1. As per IS:1172, the water consumption per head for domestic purposes for average condition is taken as:
   a) 75 lit/day
   b) 100 lit/day
   c) 135 lit/day
   d) 155 lit/day

2. The disease methaemoglobinemia is caused when drinking water supply contains high concentration of
   a) Iron
   b) Fluoride
   c) Nitrate
   d) Nitrite

3. Maximum permissible limit of fluoride in drinking water should not exceed
   a) 0.5 ppm
   b) 1.5 ppm
   c) 5.0 ppm
   d) 10.0 ppm

4. Aeration of water is done for removal of
   a) Hardness
   b) Turbidity
   c) Colour
   d) Odour

5. The Disinfection by chlorination is most effective at pH
   a) 2.0
   b) 5.0
   c) 7.0
   d) 10.0

6. Pressure Filter is used mostly in
   a) Urban Water supply
   b) Rural Water supply
   c) Swimming Pools
   d) Industries

7. Alum as a coagulant is most effective in pH range
   a) 2.5-4.5
   b) 4.5-6.5
   c) 6.5-8.5

d) 8.5-10.5

8. Which method of disinfection is mainly used in rural areas?
   a) Boiling
   b) Excess lime treatment
   c) Potassium Permanganate treatment
   d) Silver treatment

9. Out of the following, which is the most destructive disinfectant?
   a) Molecular chlorine
   b) Hypochlorous acid
   c) Hypochlorite ions
   d) Dichloroamine

10. Which of the following means cannot be used for sterilisation?
   a) Physical
   b) Chemical
   c) Physiochemical
   d) Biological

11. Pipes for branches to bathrooms and labatories in domestic water supply are
   a) 5 mm
   b) 12 mm
   c) 20 mm
   d) 25 mm

12. The water supply pipeline of the following material which has long life and is durable , not easily corroded but heavy and brittle is
   a) Ductile Iron
   b) Cast Iron
   c) Mild Steel
   d) Reinforced Cement Concrete

13. The valve which allows unidirectional flow of water in a pipe is
   a) Reflux Valve
   b) Gate valve
   c) Sluice valve
   d) Washout valve

14. When the first rains arrive, the unwanted matter will be washed into the tank. This system is called as :
   a) First Flush system
   b) Wash water system
   c) Harvesting system
   d) Cleaning system

15. Which state has made roof top rainwater harvesting structure compulsory to all the houses across the state?
   a) Kerala
   b) Karnataka
   c) Tamil Nadu

d) Andhrapradesh

16. What are Gutters in Rainwater Harvesting system?
    a) the systems that remove contaminants and debris
    b) the delivery system for the treated rainwater, either by gravity or pump
    c) the transport channels from catchment surface to storage
    d) the surface upon which the rain falls

17. Which of the following is not an anthropogenic cause of air pollution?
    a) Burning of Fossil Fuels
    b) Burning of Firewood
    c) Agricultural Activities
    d) Burning of Forests due lightening

18. About 90% of world's air pollution is caused by
    a) primary air pollutants
    b) secondary air pollutants
    c) volcanism
    d) none of them

19. The primary air pollutant which is formed due to incomplete combustion of organic matter
    a) Methane
    b) Sulphur dio oxide
    c) Ozone
    d) Carbon monoxide

20. Fluctuating noise levels from various sources at a place over a period of time can be represented by a constant value over that entire time period, by a value of sound known as
    a) Equivalent noise level
    b) average noise level
    c) Noise Pressure level
    d) Average noise level

Q2. Attempt any FOUR **(04 X 05 marks= 20 marks)**

1. Sketch different layouts of distribution network along with its advantages and disadvantages.
2. Difference between Slow sand Filter and Rapid Sand Filter
3. Explain Breakpoint Chlorination with graph.
4. Give the requirements of a good water meter
5. Write a note on Rain water Harvesting Techniques.
6. Prove that 50 dB + 50 dB ≠ 100

Q3. Attempt any TWO **(02 X 10 marks= 20 marks)**

1. Design the dimensions of rapid sand filter for treating water required for a population of 1,00,000 which is to be served by 250 l/p/d water supply. Assume whatever data necessary and not given.
2. Two primary settling tanks are 28 m in diameter with a a 2.5m side water depth. Single Effluent weirs are located on the peripheries of the tank.
   For a water flow of 30,000 m3/d, calculate :
   i)Surface area and volume
   ii)Overflow rate in m3/m2.d
   iii) Detention Time in hours and
   iv)Weir loading in m3/m.d
3. Determine the quantity of alum required in order to treat 13 million litres of water per day at a treatment plant , where 12 ppm of alum dose is required. Also determine the amount of Carbon dioxide gas which will be released per litre of water treated
4. Calculate quantity of bleaching powder required per day for disinfecting 5 MLD. The dose of chlorine has to be 0.7 ppm and bleaching powder contains 30% of available chlorine.