

**BIRLA INSTITUTE OF TECHNOLOGY MESRA
(END SEMESTER EXAMINATION)**

**CLASS: B.ARCH. / B.TECH.
BRANCH: ARCHITECTURE**

**SEMESTER: 4TH
SESSION: SP/22**

SUBJECT: BUILDING SERVICES-I WATER SUPPLY & SANITATION (AR 251)

TIME: 02 HOURS

MARKS: 50

Instructions

- The question paper contains two parts: Part “A” & Part “B”
- Part “A” consists of 30 multiple choice questions of 01 marks each. There may be one or more option suitable for each question.
- Part “B” consists of 10 short answer type questions of 02 marks each. Write answers to the point and in brief.
- Support your answers with relevant sketches wherever required.

PART “A”

Multiple Choice Questions.....(1*30 = 30)

1. Which among the following is included in Water Treatment Process?
 - a) Fluoridation
 - b) Screening
 - c) Sedimentation
 - d) Disinfection

2. Which among the following matches correctly with their respective Design Period?
 - a) Water Storage by Dams – 50 Years
 - b) Distribution System – 30 Years
 - c) Water Treatment Units – 20 Years
 - d) Infiltration Works – 45 Years

3. For a typical family of four members in a tier two-city with a sewerage system, the lpcd requirement will be:
 - a) 650
 - b) 600
 - c) 750
 - d) 800

4. Stagnation of water occurs in which of the following water distribution network:
 - a) Ring System
 - b) Dead-End System

- c) Radial System
 - d) Grid Iron System
5. When the source of water supply is at a sufficient elevation above the distribution area, then the type of the water distribution system used is:
- a) Pumping System
 - b) Gravity System
 - c) Dead End System
 - d) Ring System
6. Which of the following is a valve used in Water Supply System?
- a) Sluice Valve
 - b) Scour Valve
 - c) Pillar Valve
 - d) Check Valve
7. Copper pipes are generally used in:
- a) Hot Water Supply
 - b) Cold Water Supply
 - c) HVAC systems
 - d) Rainwater Pipe
8. Which of the following is required for calculating the amount of rainwater harvested from the roof top?
- a) Area of Roof
 - b) Runoff Coefficient
 - c) Annual Rainfall of the Region
 - d) Rainwater Pipe
9. Which of the following is part of Solid Waste Management?
- a) Segregation at Source
 - b) Conveyance of Solid Waste
 - c) Disposal of Solid Waste
 - d) All of the above
10. Which of the following is a method of Disposal of Solid Waste?
- a) Incineration
 - b) Sanitary Landfill
 - c) Ocean Dumping
 - d) Vermi Composting
11. The wastewater containing human excreta is known as:

- a) Sewage
- b) Sullage
- c) Sewerage
- d) Waste water

12. Fittings to prevent foul gases coming out of soil pipe/ waste pipe is called:

- a) Floor Traps
- b) Floor Drains
- c) Soil Waste Pipe
- d) Waste water Pipe

13. The number of pipes used in a Two Pipe System is:

- a) 01
- b) 02
- c) 03
- d) 04

14. A drain or pipe that allows water to flow under a road, rail or similar obstruction is called:

- a) Rain Gutter
- b) Street Gutter
- c) Surface Drains
- d) Culvert

15. Which of the following is a type of Storm Water Inlet?

- a) Curb Inlet
- b) Gutter Inlet
- c) Composite Inlet
- d) None of these

16. -----is the top opening to an underground utility vault used to house an access point for making connections, inspection, valve adjustments or performing maintenance on underground and buried public utility and other services including sewers, telephone,electricity, storm drains, district heating and gas.

- a) Catchbasin
- b) Manhole
- c) Gutter
- d) Culvert

17. Which of the following type of Trap is used in Wash Basins?

- a) Nahani Trap
- b) Intercepting Trap
- c) Gully Trap

- d) Bottle Trap
18. Adequate slope is required to be maintained on Terrace for Rain water discharge. True/False
- a) True
 - b) False
 - c) Partly True
 - d) None of these
19. The waste water from kitchens and toilets is carried through the same Sewer Pipe. True/False.
- a) True
 - b) False
 - c) Partly True
 - d) None of these
20. Which of the following processes occurs in Septic Tank?
- a) Aerobic Decomposition
 - b) Anaerobic Decomposition
 - c) Oxidation
 - d) Stabilization
21. The top layer in a Septic Tank is of:
- a) Scum
 - b) Effluent
 - c) Water
 - d) None of the above
22. Sewage Treatment consists of:
- a) Screening
 - b) Sedimentation
 - c) Aeration
 - d) None of the above
23. A process in which the sludge produced from the secondary sedimentation tank is reintroduced into the aeration unit as it is already activated by aeration process and bacterial activity is called:
- a) Activated Sludge Process
 - b) De-Activated Sludge Process
 - c) Sedimentation
 - d) All of the above
24. The theoretical time required for a given amount of wastewater to pass through a Septic tank at a given rate of flow is called:
- a) Reverberation Time
 - b) Detention Time
 - c) Time Period
 - d) None of the above
25. Primary Treatment in a Septic Tank has:
- a) Screens
 - b) Grit Chamber

- c) Detritus Chamber
- d) Skimming Tank

26. Which of the following treatment of Sewage is also called Biological Treatment?

- a) Primary Treatment
- b) Secondary Treatment
- c) Tertiary Treatment
- d) None of the above

27. The slope in the sludge digestion tank is generally:

- a) 1:2
- b) 1:3
- c) 1:8
- d) 1:20

28. Acceptable Turbidity (NTU) in water is:

- a) 1
- b) 2
- c) 20
- d) 10

29. In which of the following water distribution network water can be supplied to any point from at least two directions:

- a) Radial System
- b) Grid-Iron System
- c) Ring System
- d) Dead-End System

30. Which of the following is a type of Incineration Process?

- a) Refuse Derived Fuel
- b) Mass Burn
- c) Recycle
- d) None of the above

PART "B"

Short Answer Type Questions.....(2*10 = 20)

1. What is the difference between Coagulation & Flocculation in the water treatment process?
2. The water consumption of a high-rise apartment building with 60 dwelling units having an average household size of 05 persons is 135 lpcd. Assuming 80% of the total use is met with recycled water supply, the daily domestic demand for the building is ----- liters.
3. Explain any three different types of pipe fittings in the water supply with a diagram.
4. What do you mean by Garbage Chute? Explain with the help of a sketch.
5. Discuss Sanitary landfills with the help of a diagram.
6. What are the different types of Pipe systems? Explain with sketches.
7. What is a Trap & what are their different types as per their shapes? What is the difference between a Floor Trap & Floor Drain?
8. Draw a plumbing layout of a Kitchen & Toilet of a 01 BHK residential unit. Show every component of plumbing related to water supply and wastewater disposal.
9. Draw a plumbing layout of the terrace of a 01BHK residential unit. Show every component of plumbing related to water supply, storm water and wastewater disposal.
10. What is a Septic Tank? Explain with the help of a diagram.

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