

SEMESTER: 05

WATER SUPPLY AND SANITATION ENGINEERING

CHAPTER -1 INTRODUCTION

1	Most common surface water supply source is			
	A.	Sea	B.	Pond
	C.	River	D.	lake
2	Which of the following gives underground water			
	A.	Spring	B.	Lake
	C.	River	D.	Reservoir
3	All water that occurs below the surface of the earth is called			
	A.	Ground water	B.	Underground water
	C.	Sub-surface water	D.	All above
4	The sub-surface water obtained under pressure is generally known as			
	A.	Open well	B.	Infiltration well
	C.	Tube well	D.	Artesian well
5	The continuous flow of water may be expected from			
	A.	Surface springs	B.	Artesian springs
	C.	Infiltration galleries	D.	Gravity springs
6	The open Wells or dug wells are also known as			
	A.	Shallow wells	B.	Percolation wells
	C.	Draw wells	D.	All above
7	A pipe sunk into ground to tap the underground water is called...			
	A.	Open well	B.	Infiltration well
	C.	Tube well	D.	Artesian well
8	Ground water from artesian wells			
	A.	Contains no suspended materials	B.	contains dissolved salts
	C.	Requires less treatment	D.	All above
9	The wells used by small town for public water supply are			
	A.	Dug well	B.	Driven wells
	C.	Tube well	D.	Hand pump
10	Dug wells are preferred when they have to be used up to a depth of _____ m.			
	A.	10	B.	20
	C.	50	D.	100
11	Generally maximum discharge from dug well ranges in _____ cu.m/hour			
	A.	10	B.	15

	C.	20	D.	50
12	The maximum yield from a tube well is generally about _____ liters/sec			
	A.	50	B.	30
	C.	20	D.	10
13	Which is suitable method for boring in hard rock and boulder region?			
	A.	Percussion	B.	Rotary
	C.	Core drilling	D.	Jetting
14	The specific retention is least in...			
	A.	Coarse gravel	B.	Sand
	C.	clay	D.	silt
15	Which is the most commonly used non-empirical formula to determine the velocity of flow of ground water?			
	A.	Darcy	B.	Slichter
	C.	Hazen	D.	Lacy
16	The location of a well is considered to be good, if it is suck into...			
	A.	Coarse gravel	B.	Silt
	C.	sand	D.	clay
17	Water to the consumers may be supplied from			
	A.	Rainy wells sunk to the water level	B.	Infiltration well dug out on the banks of rivers
	C.	Infiltration galleries connected to sump well	D.	none
18	The most widely used tube well in India is ...			
	A.	Strainer well	B.	Cavity well
	C.	Slotted well	D.	Perforated well
19	For insignificant effect on the water table as thumb rules, the tube wells should be spaced as one in every 1.5 sq km			
	A.	True	B.	False
20	A pipe sunk into the ground to tap the underground water is called			
	A.	Open well	B.	Artesian well
	C.	Tube well	D.	Infiltration well
21	Strainer type tube wells are considered unsuitable for			
	A.	Coarse gravel	B.	Fine sand strata
	C.	Clean gravel	D.	All
22	Per capita water demand is calculated in liters...			
	A.	Per person per day	B.	Per person per month
	C.	Per person per year	D.	none

23	The hard water has disadvantage of			
	A	Grater soap consumption	B	Scaling of boilers
	C	Making food tasteless	D	All above
24	Maximum permissible turbidity for drinking water, based on silica scale is _____ ppm			
	A.	5	B.	10
	C.	20	D.	50
25	The most desirable temperature of water for public supply is ...			
	A.	4.4 ° C -10 ° C	B.	10 ° C-15 ° C
	C.	15 ° C-20 ° C	D.	>26 ° C
26	The maximum permissible color for domestic supplies based on cobalt scale is 20 ppm.			
		True		False
27	The water supply system means			
	A	The entire scheme of collection and disposal of liquid waste	C	Construction of Reservoirs
	B	The complete Layout from the source of supply to the distribution	D	Construction of canal
28	Taste and odour in the water are cause due to presence of ...			
	A.	Living algae	B.	Decaying orange matter
	C.	Phenolic substance	D.	All above
29	Odours is measured in terms of...			
	A.	Silica scale	B.	Cobalt scale
	C.	Nickel scale	D.	Threshold odour
30	The water obtained from the tube Wells is known as			
	A	Surface water	B	Sub surface water
	C	runoff	D	Potable water
31	The permissible odour in domestic water should be			
	A.	No odour	B.	No objectionable odour
	C.	Scented odour	D.	15 ppm
32	For public water supply threshold odour number should be 1.			
	A	True	B	False
33	The vertical Wells provided along the banks of river to draw ground water in a dry season are called			
	A	Open wells	B	Tube wells
	C	Artesian wells	D	Infiltration wells
34	In case of public water supplies ,the permissible upper limit of chloride content is____ppm			
	A.	100	B.	150

	C.	200	D.	250
35	The presence of high quality of chloride in a river or stream waters indicate			
	A.	Pollution of water due to industrial waters	B.	Stage of decomposition of organic matter
	C.	Hardness of water	D.	all
36	Groundwater is generally free from			
	A	suspended impurities	B	dissolved impurities
	C	both a and b	D	none of above
37	The system which collect the water from the source and then discharge the collected water by means of turns on directly to the treatment system of water is known as			
	A	intake	B	conduit
	C	reservoir	D	pumping
38	Natural mineral contaminant in water is...			
	A.	calcium	B.	Fluorine
	C.	iron	D.	sodium
39	The maximum allowable limit for fluoride in drinking water is 1.5 mg/litre			
	A.	True	B.	False
40	which of the following sources gives water relatively free from impurities			
	A	River	B	Well
	C	Lake	D	spring along the hills slope
41	Which metal if present in water causes poisoning?			
	A.	Mercury	B.	lead
	C.	Arsenic	D.	All above
42	The water of a river has an important property called			
	A	Turbidity	B	permeability
	C	self-purification	D	infiltration capacity
43	The most harmful constituent of water is ...			
	A.	Manganese	B.	Bacteria
	C.	alkali	D.	all
44	The presence of algae in water indicates that water is			
	A.	Hard	B.	Soft
	C.	Acidic	D.	Turbid
45	The device installed for drawing water from the sources are called...			
	A.	Filters	B.	Intakes
	C.	Aquifers	D.	None

46	Factors considered in selection of site for intake point is that it should be			
	A.	Nearer to the treatment plant	B.	In pure zone of the water sources
	C.	Upstream of the point of disposal of water	D.	All above
47	When there are no wide fluctuation and constant head is required at the intake and where river is also not too wide, type of intake used is called...			
	A.	River intake	B.	Cross weir intake
	C.	Side weir intake	D.	lake intake
48	The horizontal tunnels constructed at a Shallow that's along the banks of river to intercept the groundwater table are called			
	A.	Canal	B.	Infiltration galleries
	C.	Springs	D.	Lakes
49	The structure constructed for transportation of water from the source of supply situated at a distances apart from the town or city is known as...			
	A.	Intake	B.	conduit
	C.	reservoir	D.	Suction pipe
50	Presence of which material is not considered dangerous in drinking water?			
	A.	Lead	B.	Zinc
	C.	calcium	D.	copper
51	Public health engineering is combination of ...			
	A.	Water supply engineering	B.	Sanitary engineering
	C.	Transportation engineering	D.	Both a & b
52	Water supply engineering related with			
	A.	Adequate quantity	B.	Good quality
	C.	Purification of water	D.	All above
53	Various uses of water			
	A.	Drinking	B.	Bathing
	C.	Sprinkling	D.	All above
54	On the earth sea has_____ % of water.			
	A.	2	B.	100
	C.	97	D.	0.75
55	Large size depression and has good quality water called as_____			
	A.	River	B.	Pond
	C.	Lake	D.	None
56	Perennial river means			
	A.	which has constant stream throughout the year	B.	which has not constant stream throughout the year

57	Infiltration well have _____ to collect water.			
	A.	intake	B.	sump well
	C.	jack well	D.	none
58	Infiltration gallery have _____ to collect water.			
	A.	intake	B.	sump well
	C.	jack well	D.	none
59	Hot spring is example of _____			
	A.	Artesian spring	B.	Gravity spring
	C.	Surface spring	D.	None
Artesian spring				
60	Shallow tube wells have their depth limited to about _____ m			
	A.	50	B.	10
	C.	30	D.	20
30				
61	Public health engineer			
	A.	Know water treatment methods	B.	Know laboratory test
	C.	Know planning, designing	D.	All above
All above				

CHAPTER -2 QUALITY AND QUANTITY OF WATER

1	The fire demand of city may be worked out by			
	A.	Kuichling's formula	B.	Bustan's formula
	C.	Freeman formula	D.	All above
2	What are the factors that affect the rate of demand?			
	A.	Size and type of community	B.	Living standards
	C.	Metering of water	D.	All above
3	Maximum seasonal consumption= X * annual average daily demand, where X=? %			
	A.	130	B.	128
	C.	100	D.	150
4	What is the design period of water treatment units?			
	A.	20 yrs	B.	30 yrs
	C.	15 yrs	D.	35 yrs
5	The population of city in 2000 is 50,000. The average increase in population over last 8 decades is 7500 and average incremental increase during 8 decades is 750. The population of the city based on incremental method, in year 2020 will be			
	A.	55000	B.	66500
	C.	60500	D.	72500
6	The pH value of drinking water should be			
	A.	7-8.5	B.	10-12
	C.	3-5	D.	12-15
7	The transitional middle portion of a logistic curve follows			
	A.	A geometric growth	B.	A constant rate
	C.	A logarithmic growth	D.	A first over curve
8	The average domestic water consumption per capita for Indian city is _____ lpcd			
	A.	135	B.	240
	C.	270	D.	150
9	The multiplying factor as applied to obtain the maximum daily water demand, in relation to the average demand is...			
	A.	1.5	B.	1.8
	C.	2.0	D.	2.7
10	The total water consumption per capita per day _____ lpcd			
	A.	135	B.	240
	C.	270	D.	150
11	The total water requirement of a city is generally assessed on the basis of			
	A.	Maximum Hourly demand	B.	Maximum daily demand + fire demand
	C.	average daily demand+ fire demand	D.	greater of a and b

12	Which method is Suitable for forecasting population for a young and rapidly growing city?			
	A.	Arithmetic mean method	B.	comparative graphical method
	C.	Geometric mean method	D.	none of these
13	The Domestic consumption in a city as compared to total demand of city is			
	A.	20%	B.	30%
	C.	60%	D.	75%
14	As per norms 45 litres of water per person per day is provided in case of			
	A.	Hotels	B.	Hospitals
	C.	office building	D.	public places
15	per capita consumption will be higher if			
	A.	pressure in distribution system will be more	B.	quality of water will be good
	C.	the living standard of people is higher	D.	All above
16	per capita consumption of water is highest in			
	A.	Schools	B.	Hospitals
	C.	offices	D.	Factories
17	Water demand for public use as compared to total demand chart in design of water works for a city is			
	A.	5%	B.	20%
	C.	10%	D.	25%
18	The company set four losses theft and wastage of water an allowance provided is			
	A.	5%	B.	20%
	C.	15%	D.	25%
19	Per capita consumption of a locality is affected by			
	A.	climate condition	B.	quality of water
	C.	distribution pressure	D.	All above
20	per capita consumption decrease when			
	A.	use of metering system is adopted	B.	good quality water is supplied
	C.	hot climate persists	D.	All above
21	The distribution mains in water supply system are design for			
	A	maximum daily demand	B	Peak hourly demand
	C	average daily demand	D	maximum demand on a maximum construction Day
22	Factor affecting prediction of future population of a city is			
	A	Birth	B	Deaths
	C	Migrations	D	All above

23	As Compared to geometric increase method of forecasting population arithmetical increase method gives			
	A	higher value	B	Lesser value
	C	same value	D	more accurate value
24	BOD of safe drinking water should be			
	A.	Nil	B.	10 ppm
	C.	20 ppm	D.	40 ppm
25	Maximum daily consumption= X *annual average daily demand, where X=? %			
	A.	180	B.	150
	C.	170	D.	120
26	The water which is not chemically pure but does not contain any harmful to is known as			
	A.	pure water	B.	pollute water
	C.	Wholesome water	D.	None
27	The impurities caused by Dispersion of solid particles that are large enough to be removed by filtration and settling are known as			
	A.	Suspended impurities	B.	Colloidal impurities
	C.	dissolved impurities	D.	All above
28	Suspended impurities consist of			
	A.	iron	B.	chlorine
	C.	bacteria	D.	All above
29	Dissolved impurities consists of			
	A.	bacteria	B.	Silt
	C.	iron	D.	fungi
30	Turbidity of water is caused due to			
	A.	Silt	B.	Finely divided organic material
	C.	clay	D.	All above
31	Dissolved impurities in water is			
	A.	Silt	B.	Calcium carbonate
	C.	clay	D.	algae
32	The BOD of raw water indicates			
	A.	the extent of organic matter present	B.	the amount of treatment required for purifying
	C.	both a and b	D.	none of the above
33	The polluted water is one which			
	A.	consists of undesirable substances rendering it unfit for drinking and domestic use	B.	is Wholesome
	C.	contains non pathogens	D.	none of above

34	The maximum safe permissible limit of sulphates in domestic water supply is ...			
	A.	100 mg/L	B.	200 mg/L
	C.	500 mg/L	D.	600 mg/L
35	Maximum hourly consumption= X * annual average hourly demand, where X=? %			
	A.	2.7	B.	2.56
	C.	1.8	D.	1.6
36	The odour of water can be determined by			
	A.	thermometer	B.	Osmoscope
	C.	Jackson's turbidimeter	D.	none
37	The colour of water is measured on			
	A.	Turbidity scale	B.	Silica scale
	C.	Platinum cobalt scale	D.	Threshold scale
38	The total amount of dissolved salts present in water can be easily estimated by measuring the...			
	A.	Temperature of water	B.	Turbidity of water
	C.	Specific conductivity of water	D.	None
39	Non-carbonate hardness of water is mainly due to			
	A.	Silicates	B.	Specific conductivity of water
	C.	Aldehyde	D.	Sulphates and chlorides
40	The growth of population may be conveniently represented by			
	A.	Semi-logarithmic curve	B.	Logistic curve
	C.	Straight line curve	D.	all
41	For large cities the suitable method for forecasting population is			
	A.	Arithmetic mean method	B.	comparative graphical method
	C.	Geometric mean method	D.	graphical method
42	The presence of bacteria in water causes			
	A.	hardness	B.	diseases
	C.	alkalinity	D.	Bad taste
43	pH value is a symbol for_____ concentration			
	A.	magnesium	B.	Calcium
	C.	hydrogen	D.	sodium
44	Low turbidity of water can be determined by			
	A.	Turbidity meter	B.	Baylis turbidity meter
	C.	Jacksons turbidity meter	D.	Hellige turbidity meter
45	The Product of H ⁺ ion and OH ⁻ ion in a water solution is equal to			
	A.	0	B.	10 ⁻⁷
	C.	10 ⁻¹	D.	10 ⁻¹⁴

46	The permissible amount of nitrites present in potable water...			
	A.	Nill	B.	5 ppm
	C.	10 ppm	D.	20 ppm
47	Water supply scheme is usually design for life of _____years			
	A.	100	B.	50
	C.	25	D.	10
48	For the prediction of the future population of a city , the factor to be considered is ...			
	A.	births	B.	migrants
	C.	death	D.	All
49	What is the design period for the distribution system?			
	A.	20 yrs	B.	30 yrs
	C.	25 yrs	D.	50 yrs
50	The water having pH=8, will have hydroxyl ion concentration equal to...			
	A.	10^8	B.	10^6
	C.	10^{-6}	D.	10^{-8}

CHAPTER -4 SANITATION SYSTEM

1	The sullage does not contain waste water from			
	A.	Bath room	B.	Wash basins
	C.	Kitchen	D.	Toilets
2	The water carried sewerage system removes			
	A.	Domestic sewage	B.	Storm sewage
	C.	industrial sewage	D.	all
3	The sewerage system originates from			
	A.	House sewage	B.	Laterals sewage
	C.	Main sewage	D.	Branch sewage
4	Before discharging the foul sewage into rivers ,it is generally treated by			
	A.	Screening	B.	Oxidation
	C.	Sedimentation	D.	All above
5	The small sewers are cleaned by			
	A.	Flushing	B.	Cane rodding
	C.	Wooden pills	D.	None
6	Where rainy season is limited to a few months, the type of sewage system recommended is			
	A.	Combined	B.	Separated
	C.	Partially separated	D.	none
7	The waste water coming from kitchen and bathroom is popularly known as...			
	A.	Domestic sewage discharge	B.	Drainage discharge
	C.	Sludge discharge	D.	None
8	The type of sewage system which carries storm water and sewage is called a _____ system.			
	A.	Storm water	B.	Domestic
	C.	Separated	D.	Combined
9	The water carriage system of collection of waste products is preferred to dry conservancy system, because...			
	A.	It is cheaper in cost	B.	It is more hygienic in nature
	C.	It does not require treatment before disposal	D.	It is easier to maintain
10	The term “refuse” generally does not include			
	A.	Putrescible solid waste	B.	Non- Putrescible solid waste
	C.	Excreta	D.	Ashes
11	The quantity of liquid waste flowing in sewer line during the period of rainfall is called...			
	A.	Industrial waste	B.	Storm waste
	C.	Sanitary waste	D.	All

12	Leachate is a coloured liquid , that comes out of ...			
	A.	Septic tanks	B.	Sanitary land fills
	C.	Compost plants	D.	Aerated lagoons
13	In case of combine sewer, the dry weather flow is ...			
	A.	Storm water flowing in it	B.	Industrial sewage flowing in it
	C.	Domestic sewage	D.	Both b and c
14	Decayed fruits, grass, vegetables waste etc. Belong to refuse called			
	A.	Sewage	B.	Garbage
	C.	Sullage	D.	Soil waste
15	The quantity of sanitary sewage entering the sewers would be _____ the total quantity of water supplied.			
	A.	Less than	B.	Equal to
	C.	More than	D.	Greater than
16	What do you mean by Dry weather flow?			
	A.	Average daily rate of flow	B.	Average annual rate of flow
	C.	Average monthly rate of flow	D.	Water supply allowance per capita
17	The quantity of sanitary sewage directly depends on _____			
	A.	Rate of water supply	B.	Area
	C.	Population	D.	Precipitation
18	The sludge does not contain waste water from			
	A.	Bath rooms	B.	Wash basins
	C.	Kitchen sinks	D.	Toilets
19	Water content of sewage is about			
	A.	90%	B.	95%
	C.	99%	D.	9.9%
20	Wet weather flow is _____ than the dry weather flow			
	A.	Lower	B.	Higher
	C.	Three	D.	Not equal to
21	The water carried sewerage system removes			
	A	Domestic sewage	B	Storm sewage
	C	Industrial sewage	D	All
22	Facultative bacteria survive in			
	A	The presence of oxygen	B	The absence of oxygen
	C	Both cases (a) and (b)	D	Neither (a) nor (b)
23	Disposal to sewage in large cities, is done in			
	A	Irrigation	B	Dilution
	C	Oxidation	D	Purification

24	Dry weather flow+ storm water=_____			
	A.	Dry weather flow	B.	Storm water
	C.	Wet weather flow	D.	Sanitary sewage
25	Fresh sewage may become stale in			
	A.	One hour	B.	Two to three hours
	C.	Three to four hours	D.	Six hours
26	The pipe which is used to carry the discharge from sanitary fittings like bath rooms, kitchens etc. is called			
	A.	Waste pipe	B.	Soil pipe
	C.	Vent pipe	D.	Anti-siphonage pipe
27	Most suitable section of sewer in separate sewage system is			
	A.	Rectangular section	B.	Circular section
	C.	Standard form of egg shaped sewer	D.	Modified egg shaped section
28	Which of the following sewers is preferred for combined system of sewage?			
	A.	Circular sewer	B.	Egg shaped sewer
	C.	Rectangular sewer	D.	None
29	For a country like India, where rainfall is mainly confined to one season, the suitable sewerage system will be			
	A.	Separate system	B.	Combined system
	C.	Partially combined system	D.	Partially separate system
30	Sewerage system is usually designed for_____ years			
	A.	10	B.	25
	C.	50	D.	75
31	Average rate of water consumption per head per day as per Indian Standard is____liters			
	A.	100	B.	135
	C.	165	D.	200
32	Sewage treatment units are designed for			
	A.	Maximum flow only	B.	Minimum flow only
	C.	Average flow only	D.	Maximum and minimum flow
33	The self-cleaning velocity for all sewers in India is 1-1.2 m/sec.			
	A.	True	B.	False
34	Which of the following conditions is not suitable for the disposal of excreta or sewage?			
	A.	The waste does not pollute the ground surface	B.	It is not exposed to the atmosphere
	C.	It should be accessible for children	D.	It does not give odour nuisance
35	The system to collect night soil, garbage etc. in separate vessels or deposited in pools and pits is called _____			

	A.	Conservancy system	B.	Waste allocation system
	C.	Waste deposition system	D.	Waste pit
36	Which of the following is an advantage of the conservancy system over water carriage system?			
	A.	Labour force	B.	Water consumption
	C.	Compact house design	D.	Spread of epidemic
37	What is the wastewater flow in a sewer system during the periods of dry weather with minimum infiltration called?			
	A.	Wet weather flow	B.	Dry weather flow
	C.	Wet flow	D.	Dry flow
38	The area of land where all the precipitation falls will flow downhill into a specific stream called _____			
	A.	Reservoirs	B.	Water tanks
	C.	Water towers	D.	Drainage basin
39	A pipe which is installed in the house drainage to preserve the water seal of traps is called			
	A.	Vent pipe	B.	Anti-siphonage pipe
	C.	Waste pipe	D.	Soil pipe
40	The type of sewer which is suitable for both combined and separate system is			
	A.	Circular sewer	B.	Egg shaped sewer
	C.	Rectangular sewer	D.	Semi-elliptical sewer
41	The liquid waste from kitchens, bath and basins is not called ...			
	A.	Liquid waste	B.	Sullage
	C.	Sewage	D.	None
42	Dry weather flow is:			
	A.	Average daily rate of flow	B.	Average annual rate of flow
	C.	Average monthly rate of flow	D.	None
43	The quantity of liquid water which flows in sewers during rainfall period is ...			
	A.	Sanitary sewage	B.	Industrial sewage
	C.	Storm sewage	D.	None
44	A rain sanitary sewer is constructed to carry			
	A.	Sanitary sewage	B.	Surface water
	C.	Storm sewage	D.	All
45	Dry water flow in a combined sewer is...			
	A.	Industrial sewage	B.	Domestic
	C.	Storm water	D.	Inclusive of domestic and industrial sewage but excludes storm water
46	Which of the following factors does the dry weather does not depend on?			

	A.	Rate of water supply	B.	Population growth
	C.	Infiltration of groundwater	D.	Design of sewer system
47	Fresh sewer is generally			
	A.	Alkaline	B.	Highly decomposed
	C.	Acidic	D.	A source of objectionable odour
48	The layer of vegetable waste and night soil alternatively piled above the ground to form a mound, is called...			
	A.	A heap	B.	Plateau
	C.	Windrow	D.	None
49	The arrangement made for passing the sewer lines below an obstruction below the hydraulic gradient lines called...			
	A.	Inverted syphon	B.	Compressed sewer
	C.	Conduits	D.	None
50	Where light rains are uniformly distributed throughout the year, the type of sewerage system to be adopted is...			
	A.	Combined	B.	Separated
	C.	Partially separated	D.	None