Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Environmental Engineering
Objective Type Questions (Biological Treatment of Waste Water - 022060601)

UNIT: - 1

1.	BOD represents 5 day biochemical oxygen demand at temperature of			
	A.	0°c	B.	20°c
	C.	30°c	D.	None of these
2.	The full form of BOD is _____			
	A.	Biodegradable oxygen demand	B.	Biological oxygen demand
	C.	Biochemical oxygen demand	D.	Bandwidth on demand
3.	_____ is the amount of oxygen required to oxidize only organic matter in sewage.			
	A.	Turbidity	B.	BOD
	C.	COD	D.	DO
4.	The biochemical oxygen demand is computed by _____			
	A.	Dissolved oxygen / Dilution factor	B.	Dissolved oxygen + Dilution factor
	C.	Dissolved oxygen – Dilution factor	D.	Dissolved oxygen * Dilution factor
5.	Which of the following is used for a small concentration of organic matter?			
	A.	COD	B.	TOC
	C.	BOD	D.	ThOD
6.	The BOD test is carried out for how many days?			
	A.	1 day	B.	2 days
	C.	5 days	D.	6 days
7.	At what temperature the bottles for the BOD test are incubated?			
	A.	25 degree Celsius	B.	35 degree Celsius
	C.	20 degree Celsius	D.	30 degree Celsius
8.	What is the mathematical expression of BOD?			
	A.	BOD = [(D1-D2)-(B1-B2)f]/P	B.	BOD = [(D1-D2)-(B1-B2)f].
	C.	BOD = [(D1-D2) f]/P	D.	BOD = [(D1-D2)-(B1-B2)]/P
9.	In terms of percentage how much BOD is oxidised in 5 days?			
	A.	90%	B.	70-90%

	C.	60-70%	D.	50%
10.	How is COD calculated?			
	A.	Waste water is oxidised chemically using sodium in acid solutions	B.	Waste water is oxidised chemically using dichromate in acid solutions
	C.	Waste water is oxidised chemically using bromine in acid solutions	D.	Waste water is oxidised chemically using strontium in acid solutions
11	What is the ratio of BOD/COD in untreated waste?			
	A.	1-3	B.	0.3-0.8
	C.	0.1-0.2	D.	3-5
12	What is the ratio of BOD/COD in the final effluent?			
	A.	0 8-1.2	B.	0.2-0.5
	C.	0.1-0.3	D.	0.4-0.6
13	Which of these is the used as the indicator when the titration is carried out to determine the amount of COD present in a sample.			
	A.	Methyl Orange	B.	Methyl blue
	C.	Ferroin	D.	Phenolphthalein

14	_____ is determined by measuring the dissolved oxygen used by microorganisms during the biochemical oxidation of organic matter in 5 days at 20˚C.			
	A.	BOD5 B. COD		
	C.	TOC	D.	ThOD
15	_____ is determined by measuring the dissolved oxygen used during the chemical oxidation of organic matter in 3 hours.			
	A.	COD B. BOD C. ThOD D. TOC		
16	The two major purposes of sampling in the water environment are:			
	A.	To establish a baseline B. To determine the pollution		
	C.	To test for acid	D.	To decide whether or not you can drink it
17	Which holds more DO (Dissolved Oxygen)?			
	A.	water at 20º C B. water at 10º C		
	C.	water at 5º C	D.	water at 25º C
18	Which of the following represents the amount of oxygen required for the microbial decomposition of the organic matter in water?			
	A.	TSS B. COD		
	C.	TKN	D.	BOD
19	The addition of additional nitrogen and phosphorus to aquatic systems will			
	A.	increase algae and decrease O2 B. increase O2 and decrease algae		
	C.	increase the number of fish	D.	decrease productivity
20	_____is the most important variable in the success of a water quality monitoring program.			
	A.	Fecal coliform B. Dissolved oxygen C. Community involvement D. Phosphorous		
21	Biochemical Oxygen Demand, (BOD) is a measure of organic material present in water. BOD value less than 5 ppm indicates a water sample to be _____.			
	A.	rich in dissolved oxygen. B. poor in dissolved oxygen.		
	C.	highly polluted. D. not suitable for aquatic life.		
22	Sewage containing organic waste should not be disposed in water bodies because it causes major water pollution. Fishes in such a polluted water die because of			
	A.	Large number of mosquitoes B. Increase in the amount of dissolved oxygen.		
	C.	Decrease in the amount of dissolved water.	D.	Clogging of gills by mud oxygen in

23	Which of the following conditions shows the polluted environment			
	A.	pH of rain water is 5.6.	B.	amount of carbondioxide in the atmosphere is 0.03%.
	C.	biochemical oxygen demand 10 ppm	D.	eutrophication.
24	Assertion (A) : If BOD level of water in a reservoir is less than 5 ppm it is highly polluted. Reason (R) : High biological oxygen demand means low activity of bacteria in water.			
	A.	Both A and R are correct and R is the correct explanation of A	B.	Both A and R are correct but R is not the correct explanation of A.
	C.	Both A and R are not correct	D.	A is not correct but R is correct.
25	BOD is _____			
	A.	Basic oxygen demand	B.	Biological oxygen demand
	C.	Biological oxygen deficit	D.	None of the above
26	BOD is an important measure of_____			
	A.	Oxygen content of water and waste water	B.	An organism's natural level of oxygen requirements
	C.	The oxygen using potential of water and waste water	D.	A measure of the biological activity of water and waste water
27	In BOD test, the alkaline condition is provided by_____			
	A.	Manganese sulphate	B.	Sulphuric acid
	C.	Alkaline-iodide-azide solution	D.	All the above
28	Indicator used in BOD test titration is _____			
	A.	Phenolphthalein	B.	Methelyene Blue
	C.	Methyl Red	D.	Starch
29	High amount of dissolved oxygen in a lake indicate_____			
	A.	Less water quality	B.	High turbidity
	C.	Better water quality	D.	Excessive aquatic plants or algal blooms
30	Chemical Oxygen Demand (COD) is used the quantification of			
	A.	Organic	B.	Inorganic
	C.	Both a and b	D.	None of the above
31	The chemical oxygen demand measures the …….			
	A.	Amount of oxygen required for growth of microorganism in water	B.	Amount of oxygen that would be then removed from the water inorder to oxidize pollution
	C.	Amount of oxygen required to oxidize the calcium present in waste water	D.	None of the above
32	Potassium dichromate in this test is used as			
	A.	Oxidant	B.	dye
	C.	Catalyst	D.	Both a and c
33	The liquid hazardous wastes generated as a result of COD test are			

	A.	Chromium	B.	Silver
	C.	Mercury	D.	All the above
	Usually COD test values are			
	A.	Greater than BOD test values	B.	Less than BOD test values
	C.	Almost equal to BOD test values	D.	None of the above

35	COD is _____			
	A.	Chemical Oxygen Demand	B.	Chemical Oxidized demand
	C.	Carbon Oxygen Demand	D.	None of the above
36	TOC is _____			
	A.	Total organic Chemical	B.	Total Oxidized Carbon
	C.	Total Organic Carbon	D.	None of the above
37	TOC measures _____ water			
	A.	Organic Compound	B.	Inorganic compound
	C.	A&B	D.	None of the above
38	Drinking Water TOC			
	A.	10 ppb to 100 ppm	B.	1000 ppb to 100 ppm
	C.	Not in Water	D.	100 ppb to 10 ppm
39	What is the acceptable level of TOC in drinking water?			
	A.	20 ppm	B.	25 ppm
	C.	30 ppm	D.	None of the above
40	What is measured when calculating Total Organic Carbon?			
	A.	TC	B.	TIC
	C.	DC	D.	All of the above
41	For the Calculate TOC			
	A.	**TOC = TC - TIC**	B.	TOC = POC + NPOC
	C.	**TOC = DOC + NDOC**	D.	**All of the above**
42	What will be the Total Organic Carbon (TOC) of colored water?			
	A.	100-200ppm	B.	100ppm
	C.	200ppm	D.	200-300 ppm
43	BOD limit of Drinking Water			
	A.	1-2 ppm	B.	5-6 ppm
	C.	3-5 ppm	D.	None of the above
44	_____is the permissible limit of COD			
	A.	300 mg/l	B.	100 mg/l
	C.	250 mg/l	D.	200 mg/l
45	_____is the permissible limit of BOD			
	A.	100 mg/l	B.	30 mg/l
	C.	25 mg/l	D.	50 mg/l
46	Which instrument use in BOD measurement			

	A.	TOC analyzer	B.	HVS
	C.	BOD incubator	D.	None of the above
47	Which color appear in titration of BOD BOD			
	A.	Red	B.	Blue
	C.	Black	D.	Orange
48	_____ is the capacity of the BOD bottle			
	A.	50 ml	B.	100 ml
	C.	30 ml	D.	60 ml
49	Chemical involved in COD measurement			
	A.	Potassium dichromate	B.	Potassium iodide
	C.	Sodium sulphate	D.	All of the above
50	Time required for COD test			
	A.	2-3 hr	B.	3-5 hr
	C.	2-3 days	D.	3-5 days

QUESTION NO	ANSWER
1	**B**
2	**C**
3	**B**
4	**D**
5	**B**
6	**C**
7	**C**
8	**A**
9	**C**
10	**B**
11	**B**
12	**C**
13	**C**
14	**A**
15	**A**
16	**A,B**
17	**C**
18	**D**
19	**A**
20	**B**
21	**A**
22	**C**
23	**C,D**

25	**B**
26	**C**
27	**C**
28	**D**
29	**C**
30	**C**
31	**B**
32	**A**
33	**D**
34	**A**
35	**A**
36	**C**
37	**A**
38	**D**
39	**B**
40	**D**
41	**D**
42	**A**
43	**A**
44	**C**
45	**B**
46	**C**
47	**B**
48	**C**
49	**D**

24	C

50	A

UNIT :- 2

1	The process occurred in the presence of oxygen is called			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

2	The process occurred in the albescence of oxygen is called			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

3	Which treatment is the example of Aerobic Process			
	A.	ASP	B.	UASB
	C.	RBC	D.	All of the above

4	Which treatment is the example of Anaerobic Process			
	A.	ASP	B.	UASB
	C.	MBBR	D.	All of the above

5	_____ gas is produced in Anaerobic process			
	A.	Sulfur dioxide	B.	Oxygen
	C.	Methane	D.	None of the above

6	Why pre treatment is required in aerobic process?			
	A.	Break the solids particle	B.	Reduce the chance of clogging
	C.	Improve the efficiency	D.	All of the above

7	A continuous supply of air to be mixed in with the waste material in _____process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

8	In which process large amount of gas produced			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

9	Which process required primary treatment?			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

10	_____ gas is produced in Anaerobic process			
	A.	Carbon dioxide	B.	Oxygen
	C.	Sulfur dioxide	D.	None of the above

11	Anaerobic process have a			
	A.	slower microbial growth	B.	no nitrification
	C.	higher alkalinity	D.	All of the above

12	Lower energy required in_____ process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

13	Time consuming process is_____			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

14	Bio-chemical oxygen demand (BOD) for the first 20 days in generally referred to			
	A.	Initial demand	B.	First stage demand
	C.	Carbonaceous demand	D.	All of the above

15	Odor problem produced in which process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

16	Aerobic bacteria			
	A.	Flourish in the presence of free oxygen	B.	Consume organic matter as their food
	C.	Oxidize organic matter in sewage	D.	All of the above

17	Pick up the correct statement from the following:			
	A.	In treated sewage, 4 ppm of D.O. is essential	B.	Only very fresh sewage contains some dissolved oxygen
	C.	The solubility of oxygen in sewage is 95% that is in distilled water	D.	All of the above

18	For the COD test of sewage, organic matter is oxidized by K2Cr207 in the presence of			
	A.	H2SO4	B.	HNO_3
	C.	HCl	D.	None of these

19	The agitation and aerating process required in_____ process.			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

20	60-90% COD removal achieved in _____ process.			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

21	The amount of oxygen consumed by the aerobic bacteria which cause the aerobic biological decomposition of sewage, is known			
	A.	BOD	B.	COD
	C.	DO	D.	None of the above

22	Pick up the correct statement from the following:			
	A.	Rate of digestion of sludge is more at higher temperature	B.	Thermophilic organisms digest the sludge if the temperature ranges from 40° to 60°C
	C.	Mesophilic organisms digest the sludge if the temperature is between 25° and 40°C	D.	All of the above

23	The average temperature of sewage in India, is			
	A.	10°C	B.	15°C
	C.	20°C	D.	25°C

24	For detecting the nitrates in sewage, the color may be developed by adding			
	A.	Potassium permanganate	B.	Sulphuric acid and napthamine
	C.	Phenol-di-sulphuric acid and potassium hydroxide	D.	None of these

25	The sewage treatment in septic tanks is due to			
	A.	Anaerobic decomposition	B.	Aerobic decomposition
	C.	Parasitic decomposition	D.	None of these

26	Composting Sewage sludge produced in _____ process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

27	longer start up required in _____ process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

28	Cellular respiration is called an			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

29	Aerobic respiration _____ required			
	A.	Carbon Dioxide	B.	Nitrogen
	C.	Oxygen	D.	None of the above

30	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (glucose + oxygen -> carbon dioxide + water) it is the _____ chemical reaction			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

31	higher alkalinity produced in _____ process			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

32	In which process lactic acid produced			
	A.	Aerobic process	B.	Nitrification
	C.	Anaerobic process	D.	Denitrification

33	Anaerobic take place in _____-			
	A.	Cell membrane	B.	Cell tissues
	C.	Cell wall	D.	Cytoplasm

34	Glycolysis is the example of _____			
	A.	Aerobic process	B.	Nitrification
	C.	Anaerobic process	D.	Denitrification

35	_____ Process is time consuming.			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

36	_____ process is more energy efficient			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

37	Photosynthesis is the _____			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

38	In aerobic biological process_____ reburied for the decomposition of the organic matter			
	A.	Bacteria	B.	Viruses
	C.	algae	D.	None of the above

39	Fermentation is the_____			
	A.	Aerobic process	B.	Nitrification
	C.	Anaerobic process	D.	Denitrification

40	Full form of ATP			
	A.	Adenosine Triphosphate	B.	Aerobic treatment process
	C.	Anaerobic treatment process	D.	None of the above

41	Aerobic respiration _____ required			
	A.	Oxygen and Nitrogen	B.	Oxygen and Sulfur
	C.	Oxygen and Glucose	D.	All of the above

42	_____ Respiration takes place in the cell cytoplasm and produces lactic acid.			
	A.	Aerobic process	B.	Nitrification
	C.	Anaerobic process	D.	Denitrification

43	Protozoa used for the decomposition of the organic matter in _____process			
	A.	Aerobic process	B.	Nitrification
	C.	Anaerobic process	D.	Denitrification

44	How many ATP are produced in aerobic respiration?			
	A.	34 ATP	B.	36 ATP
	C.	38 ATP	D.	40 ATP

45	The chemical equation is C6H12O6 -> 2C3H6O3 (Glucose -> Lactic acid). It is the _____chemical reaction			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

46	How many ATP are produced in anaerobic respiration?			
	A.	1 ATP	B.	2 ATP
	C.	3 ATP	D.	4 ATP

47	If COD is less than 1000 mg/l than _____is suitable.			
	A.	Aerobic process	B.	Anaerobic process

	C.	A&B	D.	None of the above

48	Trickling Filter is the example of			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

49	If COD is more than 4000 mg/l than _____ is suitable.			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

50	CSTR is the example of			
	A.	Aerobic process	B.	Anaerobic process
	C.	A&B	D.	None of the above

QUESTION NO	ANSWER
1	**A**
2	**B**
3	**A**
4	**B**
5	**C**
6	**D**
7	**A**
8	**B**
9	**A**
10	**A**
11	**D**
12	**B**
13	**B**
14	**D**
15	**B**
16	**D**
17	**D**
18	**A**
19	**A**
20	**B**
21	**C**
22	**D**
23	**C**
24	**C**
25	**A**
26	**A**
27	**B**
28	**A**
29	**C**
30	**A**
31	**B**
32	**C**
33	**D**
34	**C**
35	**B**
36	**A**
37	**A**
38	**A**
39	**C**
40	**A**
41	**C**
42	**C**
43	**A**
44	**C**
45	**B**
46	**B**
47	**A**
48	**A**
49	**B**
50	**B**

UNIT :- 3

1	_____ Treatment in which microorganism is suspended in water.			
	A.	Attached growth	B.	Nitrification
	C.	Suspended growth	D.	Denitrification

2	Full form of MLSS			
	A.	Mixed liquor Suspended Solids	B.	Mixed liquid Solid Suspended
	C.	A&B	D.	None of the above

3	Activated Sludge Process is a example of			
	A.	Aerobic	B.	Anaerobic
	C.	A&B	D.	None of the above

4	Why is the sludge aerated?			
	A.	To avoid bacterial growth	B.	To increase bacterial growth
	C.	To maintain pH	D.	To maintain temperature

5	The organisms feed on _____ in aeration tanks.			
	A.	Water	B.	Air
	C.	Sludge particles	D.	Bacteria

6	For the removal of BOD through Activated Sludge Process (ASP) what would be the Solid retention time considered?			
	A.	18 hours	B.	1-2 days
	C.	10 hrs	D.	3 days

7	What is the typical value of the F/M ratio considered for an ASP process?			
	A.	0.04 g/g.d	B.	0.1 g/g.d
	C.	0.4 g/g.d	D.	0.01 g/g.d

8	_____ is treated in activated sludge reactor.			
	A.	Pre-treated sludge	B.	Treated sludge
	C.	Macronutrients	D.	Micro-organisms

9	In trickling filter, B.O.D. is reduced to			
	A.	30 to 40%	B.	40 to 60%
	C.	60 to 80%	D.	80 to 90%

10	_____Ml/g is good settling of sludge			
	A.	1	B.	10
	C.	100	D.	1000

11	Full form of MLVSS_____			
	A.	Mixed liquid Volatile Solid Suspended	B.	A&C
	C.	Mixed liquor Volatile Suspended Solids	D.	None of the above

12	Activated Sludge Process is a example of			
	A.	Attached Growth Process	B.	Suspended Growth Process
	C.	Hybrid Process	D.	All of the above

13	After the treatment, the BOD demand _____			
	A.	Remains constant	B.	Decreases
	C.	Increases	D.	Alters

14	The sewage treatment units in which anaerobic decomposition of organic matter is used, are called			
	A.	Imhoff tanks	B.	Trickling filters
	C.	Sludge sedimentation tanks	D.	None of these

15	For the conversion of particulate organics through Activated Sludge Process (ASP) what would be the Solid retention time considered?			
	A.	18 hours	B.	1-2 days
	C.	2-4 days	D.	5 days

16	Which packing material used in trickling filter?			
	A.	Rock	B.	Gravel
	C.	Sand	D.	All of the above

17	Detention period adopted for oxidation pond is			
	A.	24-36 hrs	B.	2-4 days
	C.	1-2 week	D.	2-6 week

18	Composting and lagooning are the methods of			
	A.	Filtration	B.	Sedimentation
	C.	Sludge digestion	D.	Sewage disposal

19	Trickling Filter is a			
	A.	Aerobic	B.	Anaerobic
	C.	A&B	D.	None of the above

20	Full form of RAS_____			
	A.	Return Active Solids	B.	Rapid Activated Sludge
	C.	Rapid Activated Solids	D.	Return Activated Sludge

21	Which is the next reactor after activated sludge reactor in the treatment process?			
	A.	Flocculation unit	B.	Aeration unit
	C.	Clarifier	D.	Disinfection unit

22	While designing aeration tank for the ASP what is the volumetric organic loading rate considered?			
	A.	0.3-3	B.	0.03-0.2
	C.	3-5	D.	5-7

23	In a trickling filter			
	A.	Filtration process is used	B.	Biological action is used
	C.	Neither (a) nor (b)	D.	Both (a) and (b)

24	In the activated sludge process			
	A.	Aeration is continued till stability	B.	Sludge is activated by constant stirring
	C.	Aeration is done with an admixture of previously aerated sludge	D.	Water is removed by centrifugal action

25	Aerated Lagoons is a example of			
	A.	Attached Growth Process	B.	Suspended Growth Process
	C.	Hybrid Process	D.	All of the above

26	Where is the sludge at the bottom of the clarifier processed to?			
	A.	Settling unit	B.	Aerator
	C.	Flocculation unit	D.	Disinfection unit

27	Which of these is not an alternative to activated sludge treatment systems?			
	A.	Stabilization ponds	B.	Rotating biological reactors
	C.	Trickling filter	D.	Screening units

28	The maximum efficiency of BOD removal is achieved in			
	A.	Oxidation ditch	B.	Oxidation pond

	C.	Aerated lagoon	D.	Trickling filter
29	Full form of SVI_____			
	A.	Solids Volume Index	B.	Sludge Volume Index
	C.	Solid Volatile Index	D.	None of the above

30	What is the range of pH above which aeration is required?			
	A.	2 mg/L	B.	5 mg/L
	C.	8 mg/L	D.	10 mg/L

31	An activated sludge system consists of two components, an aerator and _____			
	A.	Screening units	B.	Disinfection unit
	C.	Flocculation unit	D.	Clarifier

32	How many types of aerators are present?			
	A.	2	B.	3
	C.	4	D.	5

33	In rotating biological contractors, what percent of corrugated plastic discs are submerged?			
	A.	20	B.	50
	C.	80	D.	40

34	How is air pumped in the aerator unit?			
	A.	Bubbled from bottom	B.	Sides
	C.	Bubbled from top	D.	Sprayed

35	Full form of SRT			
	A.	Solid Retention Time	B.	Sludge Reject Time
	C.	Solid Return Time	D.	None of the above

36	Stabilization pond is a example of			
	A.	Attached Growth Process	B.	Suspended Growth Process
	C.	Hybrid Process	D.	All of the above

37	RBC is similar to			
	A.	Trickling Filter	B.	Oxidation pond
	C.	ASP	D.	All of the above

38	Which components are in RBC?

	A.	Shaft	B.	Disc
	C.	A&B	D.	None of the above

39	Which are the three ingredients in activated sludge systems?			
	A.	Cells, sewage and oxygen	B.	Cells, sewage and nitrogen
	C.	Solids, sewage and oxygen	D.	Solids, water and oxygen

40	Trickling Filter is an example of			
	A.	Attached Growth Process	B.	Suspended Growth Process
	C.	Hybrid Process	D.	All of the above

41	The advantages of RBC is			
	A.	Low sludge production	B.	Low space requirements
	C.	Low energy requirements	D.	All of the above

42	Which plastic media is used in RBC?			
	A.	Polyethylene	B.	PVC
	C.	Polystyrene	D.	All of the above

43	_____system consists series of a pond			
	A.	Waste Stabilization Pond	B.	Activated Sludge Process
	C.	Trickling Filter	D.	All of the above

44	BOD removal efficiency of waste stabilization pond_____%			
	A.	75-85	B.	70-80
	C.	60-70	D.	65-75

45	Rotating Biological Contractor is a example of			
	A.	Attached Growth Process	B.	Suspended Growth Process
	C.	Hybrid Process	D.	All of the above

46	The disadvantages of RBC is			
	A.	High operation cost	B.	Lack of flexibility
	C.	Neither A&B	D.	Both A&B

47	Which equation is used to identify volume of TF?			
	A.	NRC equations	B.	Rankins equation
	C.	Eckenfilder equation	D.	All of the above

48	How many types of trickling filter?			
	A.	2	B.	3
	C.	4	D.	5

49	Which is type of activated sludge process?			
	A.	plug flow system	B.	tapered aeration
	C.	oxidation ditches	D.	All of the above

50	Which is not a suspended growth process?			
	A.	RBC	B.	TF
	C.	A&B	D.	None of the above

QUESTION NO	ANSWER
1	C
2	A
3	C
4	B
5	C
6	B
7	A
8	A
9	C
10	C
11	C
12	B
13	B
14	B
15	C
16	D
17	D
18	D
19	A
20	D
21	C
22	A
23	B
24	C
25	B
26	B
27	D
28	A
29	B
30	D
31	D
32	C
33	D
34	A
35	A
36	B
37	A
38	C
39	A
40	A
41	D
42	D
43	A
44	A
45	A
46	D
47	D
48	C
49	D
50	C

UNIT :- 4

1	In which process microorganisms are attached to the media			
	A.	Attached growth Process	B.	Suspended growth process
	C.	Hybrid process	D.	All of the above

2	Which is a example of Attached growth Process?			
	A.	TF	B.	RBC
	C.	A&B	D.	None of the above

3	Attached growth process is used for			
	A.	BOD removal	B.	Nitrification
	C.	Denitrification	D.	All of the above

4	The main purpose of covering trickling filters is to:			
	A.	Prevent algae growth on the media	B.	Control odors
	C.	Control growth of flies and snails	D.	Prevent heat loss and increase efficiency

5	_____digestion occurs in the presence of oxygen			
	A.	Aerobic	B.	Anaerobic
	C.	Anoxic	D.	All of the above

6	Full form of UASB			
	A.	Upflow anaerobic sludge blanket	B.	Upflow aerobic sludge blanket
	C.	Upflow anoxic sludge blanket	D.	None of the above

7	How does the wastewater enter the UASB reactor?			
	A.	Bottom	B.	Top
	C.	Side	D.	Top and side

8	For what range of COD level anaerobic digestion is carried out?			
	A.	400-800	B.	900-1200
	C.	1500-2000	D.	300-400

9	A sludge blanket in the UASB reactor is _____			
	A.	At the top	B.	At the bottom
	C.	Absent	D.	In between

10	Which of the following biological processes can produce alkalinity?			
	A.	Carbonaceous BOD removal	B.	Denitrification
	C.	Nitrification	D.	Phosphorus removal by chemical addition with ferrous chloride

11	_____ Digestion produced fuel.			
	A.	Aerobic	B.	Anaerobic
	C.	Anoxic	D.	All of the above

12	UASB is _____ process			
	A.	Aerobic	B.	Anaerobic
	C.	Anoxic	D.	All of the above

13	_____ breaks down the organic matter.			
	A.	Bacteria	B.	Fungi
	C.	Virus	D.	Algae

14	_____ at the top prevent an outflow of the sludge blanket.			
	A.	Rubber cock	B.	Out pipe
	C.	Baffle	D.	Stopper

15	Sludge wasting rates affect			
	A.	Nitrification ability	B.	Growth rate of microorganisms
	C.	Aeration tank solids inventory	D.	All of the above

16	_____ uses anaerobic digestion.			
	A.	Incineration	B.	Combustion
	C.	Fermentation	D.	Oxygenation

17	What is the size of the microbial granules in the UASB?			
	A.	0.3-0.6 mm	B.	0.5-0.8 mm
	C.	1-3 mm	D.	3-6 mm

18	What is the main reason why MCRT is increased during the winter season?			
	A.	To improve sludge settling	B.	To increase DO levels in the aeration tank
	C.	To reduce straggler floc in the effluent	D.	To increase solids inventory since bacteria activity is slower

19	What is the product gases released at the end of the UASB process?			
	A.	Methane	B.	Methane and carbon-dioxide
	C.	Oxygen and carbon-dioxide	D.	Carbon-dioxide

20	What is biogas composed of?			
	A.	O2 and CO2	B.	CO2 and NO2
	C.	CH4 and O2	D.	CH4 and CO2

21	What is the means used for the mixing of the sludge in UASB?			
	A.	Magnetic stirrer	B.	Electrically driven stirrer
	C.	Mechanical mixing	D.	By means of bubbles

22	What is the optimum temperature at which anaerobic digestion is carried out?			
	A.	25-35 degree Celsius	B.	55 degree Celsius
	C.	45 degree Celsius	D.	40-50 degree Celsius

23	_____ deflects the materials downwards in UASB reactor.			
	A.	Baffles	B.	Sloped walls
	C.	Deflectors	D.	Separator

24	What is the percentage of Carbon dioxide produced during anaerobic digestion?			
	A.	70-80%	B.	80-90%
	C.	30-50%	D.	50-60%

25	What is the percentage of methane in the sludge digestion?			
	A.	10-20 %	B.	20-40 %
	C.	45-65 %	D.	55-75 %

26	What is the rate limiting step in anaerobic digestion?			
	A.	Methanogenesis	B.	Hydrolysis
	C.	Acidification	D.	Biogas production

27	A clarified effluent is extracted from the _____ of the UASB reactor.			
	A.	Top	B.	Side
	C.	Bottom	D.	Central pipe

28	What is the hydraulic retention time for a completely mixed anaerobic digestion process?			
	A.	15-30 days	B.	40-50 days

	C.	50-60 days	D.	60-80 days
29	What is the hydraulic retention time for a completely mixed anaerobic contact type process?			
	A.	8-10 days	B.	5-8 days
	C.	0.5-5 days	D.	10-12 days

30	How many steps are present in anaerobic digestion?			
	A.	1	B.	2
	C.	3	D.	4

31	What is the minimum pH to be maintained in the UASB reactor?			
	A.	5.6	B.	6.3
	C.	7.5	D.	8.2

32	What is the volumetric organic loading in Kg COD/ m3 day for a completely mixed anaerobic digestion process?			
	A.	1-5	B.	5-7
	C.	7-9	D.	9-12

33	What is the temperature which should not be exceeded for the reaction in UASB reactor?			
	A.	20˚C	B.	32˚C
	C.	38˚C	D.	45˚C

34	What is the minimum influent COD load beneficial for the UASB reactor?			
	A.	100 mg COD/Lm	B.	200 mg COD/Lm
	C.	250 mg COD/Lm	D.	350 mg COD/Lm

35	What is the temperature that needs to be maintained during the sludge digestion process?			
	A.	90˚F	B.	95˚F
	C.	100˚F	D.	105˚F

36	What is the minimum hydraulic retention time for UASB?			
	A.	1 hour	B.	2 hour
	C.	3 hour	D.	4 hour

37	What is the volumetric organic loading in Kg COD/ m3 day for an anaerobic contact digestion process?			
	A.	1-8	B.	8-10
	C.	10-12	D.	12-15

38	The pathogens in digestate are _____			
	A.	Highly active	B.	Inactive
	C.	Partly inactive	D.	Neutral

39	What is the COD loading rate assumed for an Up flow anaerobic sludge blanket (UASB)?			
	A.	4-12 Kg COD/m^3	B.	12-20 Kg COD/m^3
	C.	2-4 Kg COD/m^3	D.	20-25 Kg COD/m^3

40	What is the range of retention time during anaerobic digestion?			
	A.	10-20 days	B.	20-30 days
	C.	40-80 days	D.	40-100 days

41	What is the up flow velocity considered for a UASB while treating 100% soluble COD?			
	A.	1-3 m/h	B.	4-6 m/h
	C.	6-8 m/h	D.	8-10 m/h

42	What is the retention time considered for a UASB while designing at 16-19 degree Celsius?			
	A.	3-5 h	B.	10-14 h
	C.	22 h	D.	18 h

43	What is the volumetric organic loading in Kg COD/ m3 day for an anaerobic sequence batch reactor?			
	A.	4-6	B.	1.2-2.4
	C.	2.6-3.4	D.	6.4-7.6

44	Calculate the volume for the UASB with the following details. Flow: 120m3/h COD: 350 mg/L UASB load considered: 6 Kg COD/ m3			
	A.	7 m^3	B.	8 m^3
	C.	8.5 m^3	D.	9 m^3

45	How much is the cow yield from anaerobic digestion that can be obtained?			
	A.	0.1 m3/Kg dung	B.	0.2 m^3/Kg dung
	C.	0.3 m3/Kg dung	D.	0.4 m3/Kg dung

46	What is the up flow velocity considered for a UASB while treating partially soluble COD?			
	A.	1-1.25 m/h	B.	1.5-2 m/h
	C.	2-3 m/h	D.	3-4 m/h

47	In anaerobic digestion system which of the following statement holds good?

	A.	Acids are necessary to be added to make the pH neutral	B.	Alkaline are necessary to be added to make the pH neutral
	C.	A flocculants is to be added to bring about flocculation	D.	A coagulant is necessary to be added in order to bring about coagulation

48	In which industries UASB is mainly used?			
	A.	Dairy	B.	Textile
	C.	Dye	D.	Pulp and paper

49	Which is the advantage of UASB reactor?			
	A.	High Efficiency	B.	Low space requirement
	C.	Low sludge production	D.	All of the above

50	What is the up flow velocity considered for a UASB while treating domestic waste water?			
	A.	1-2 m/h	B.	2-3 m/h
	C.	0.8-1 m/h	D.	3-4 m/h

QUESTION NO	ANSWER
1	A
2	C
3	D
4	B
5	B
6	A
7	A
8	C
9	D
10	A
11	B
12	B
13	A
14	C
15	B
16	A
17	C
18	B
19	B
20	D
21	D
22	A
23	B
24	C
25	D
26	A
27	A
28	A
29	C
30	C
31	B
32	A
33	C
34	C
35	C
36	B
37	A
38	C
39	A
40	D
41	A
42	B
43	B
44	A
45	D
46	A
47	B
48	A
49	D
50	C

UNIT :- 5

1	_____is the biological oxidation of ammonia to nitrite followed by the oxidation of the nitrite to nitrate.			
	A.	Activated sludge process	B.	Anaerobic process
	C.	Nitrification	D.	Denitrification

2	Nitrification is performed by a small group of _____			
	A.	Autotrophic bacteria	B.	Eutrophic bacteria
	C.	Fungi	D.	Viruses

3	In nitrification, ammonia is converted to _____			
	A.	Nitrogen	B.	Nitrate
	C.	Nitrite	D.	Amide

4	Full form of SDNR			
	A.	Specific denitrified rate	B.	Specific denitrification rate
	C.	A&B	D.	None if the above

5	A well oxidized sewage contains nitrogen mainly as			
	A.	Nitrates	B.	Nitrites
	C.	Free ammonia	D.	None of these

6	What is the percentage of sludge in phosphorus removal by chemical precipitation?			
	A.	10	B.	20
	C.	30	D.	40

7	What is the amount of phosphorus present in municipal wastewater?			
	A.	1-2 mg/L	B.	2-8 mg/L
	C.	4-12 mg/L	D.	5-20 mg/L

8	What is the phosphorus available for a biological process called?			
	A.	Phosphate	B.	Orthophosphate
	C.	Polyphosphate	D.	Biophosphorus

9	In dissimilatory denitrification, _____ serves as the electron acceptor in energy metabolism.			
	A.	Nitrate	B.	Nitrite
	C.	Nitrogen	D.	Ammonia

10	Kjeldahl nitrogen is a mixture of			
	A.	Ammonia and nitrogen	B.	Organic nitrogen and ammonia
	C.	Nitrogen and organic nitrogen	D.	All of the above

11	How much amount of phosphorus is removed by secondary treatment?			
	A.	0.2-0.3 mg/l	B.	0.4-0.6 mg/l
	C.	0.5-1 mg/l	D.	1-2 mg/l

12	What is the optimum pH for nitrosomonas?			
	A.	6.5-7.5	B.	7.5-8.5
	C.	9.5-10.5	D.	13.5-14

13	What does PAO stand for?			
	A.	Poly-ammonium oxygenate	B.	Polyphosphate-accumulating organisms

	C.	Poly-ammonium organisms	D.	Phosphate-ammonium organisms

14	What is the percentage of phosphorus present in bacterial biomass?			
	A.	0.2%	B.	0.3%
	C.	0.8%	D.	1%

15	The nitrification process is controlled by temperature and what other factor?			
	A.	SRT	B.	Sludge settling rate
	C.	Phosphorus levels	D.	Hydraulic loading

16	What is the minimum temperature required for denitrification process?			
	A.	3˚C	B.	5˚C
	C.	15˚C	D.	30˚C

17	What is the retention time considered for the anaerobic zone for the AO process for removing phosphorus?			
	A.	0.5-1.5 hrs	B.	1.5-2 hrs
	C.	2-4 hrs	D.	4-8 hrs

18	What is the retention time considered for the anaerobic zone for the A2O process for removing phosphorus?			
	A.	0.5-1.5 hrs	B.	1.5-2 hrs
	C.	5-7 hrs	D.	3-4 hrs

19	_____ is the biochemical degradation of Organic-N into NH_3 or NH_4^+.			
	A.	Nitrogen fixation	B.	Ammonification
	C.	Nitrification	D.	Denitrification

20	Denitrification releases _____			
	A.	Nitrogen	B.	Oxygen and nitrogen
	C.	Carbon-dioxide	D.	Nitrogen and carbon-monoxide

21	What is the retention time considered for the aerobic zone for the AO process for removing phosphorus?			
	A.	1-3 hrs	B.	3-5 hrs
	C.	5-8 hrs	D.	8-11 hrs

22	Which of the following bacteria is used in nitrification process?			
	A.	Escherichia coli	B.	Nitrosomonas

	C.	Morganella	D.	Providencia

23	Nitrogen cycle of sewage, is			
	A.	Liberation of ammonia-formation of nitrites-formation of nitrates-liberation of nitrogen	B.	Liberation of nitrogen-liberation of ammonia-formation of nitrites- formation of nitrates
	C.	Liberation of nitrogen-formation of nitrates-formation of nitrites-liberation of ammonia	D.	Formation of nitrates-formation of nitritesliberation of nitrates-liberation of nitrates

24	What is the SDNR assumed while designing postanoxic tank?			
	A.	0.1-0.4	B.	1.5-2
	C.	0.8-1	D.	3-4

25	Which of these chemicals is added in the post anoxic step?			
	A.	Acetate	B.	Propanol
	C.	Butanol	D.	Chloroform

26	What is the retention time considered for the aerobic zone for the A2O process for removing phosphorus?			
	A.	0.5-1.5 hrs	B.	1.5-3 hrs
	C.	3-4 hrs	D.	4-8 hrs

27	How many molecules of oxygen are required for one molecule of nitrogen?			
	A.	1	B.	2
	C.	3	D.	4

28	How is the SDNR related to the BOD?			
	A.	SDNR = 0.3 F/M	B.	SDNR = 0.03/(F/M)
	C.	SDNR = 0.03 F/M	D.	SDNR = 3 F/M
29	For the removal of nitrogen completely through Activated Sludge Process (ASP) what would be the Solid retention time considered?			
	A.	3-18 days	B.	1-2 days
	C.	12 hours	D.	18 hours

30	For the removal of phosphorous through Activated Sludge Process (ASP) what would be the Solid retention time considered?			
	A.	18 hours	B.	1-2 days

	C.	10 hrs	D.	2-4 days

31	Ammonia is converted into nitrogen by which type of bacteria in anaerobic conditions?			
	A.	Autotrophic	B.	Heterotrophic
	C.	Organotrophs	D.	Lithotrophs

32	At what detention time maximum saturation rates are experienced in a denitrification process?			
	A.	72 mins	B.	30-40 mins
	C.	10-20 mins	D.	22-24 mins

33	Why it is necessary to treat the forms of nitrogen?			
	A.	Minimize Ph	B.	To prevent odor problem
	C.	To control growth of nitrogen	D.	All of the above

34	What is the retention time considered for the anoxic zone for the A2O process for removing phosphorus?			
	A.	0.5-1 hrs	B.	1-2 hrs
	C.	2-4 hrs	D.	4-6 hrs

35	Which of the below is used to denitrify nitrates?			
	A.	Carbon	B.	Aluminium
	C.	Iron	D.	Copper

36	What is the temperature at which the denitrification process takes place when it is carried out in a fluidised bed reactor?			
	A.	30-35 degree	B.	35 degree
	C.	40 degree	D.	25 degree

37	When is internal recirculation required for preanoxic tank?			
	A.	SDNR=1	B.	SDNR =2-4
	C.	SDNR<1	D.	SDNR =4-6

38	What is the retention time considered for the aerobic zone for the Virginia Initiative Plant treatment process for removing phosphorus?			
	A.	4-6 hrs	B.	10-12 hrs
	C.	2-4 hrs	D.	1-2 hrs

39	What is the retention time considered for an anoxic zone for the removal of nitrogen for modified Ludzack Ettinger treatment system?

	A.	1-3 hrs	B.	3-4 hrs
	C.	4-8 hrs	D.	8-12 hrs

40	What is the process for converting organic-nitrogen to ammonia?			
	A.	Hydrolysis	B.	Nitrification
	C.	Denitrification	D.	Oxidation

41	Which is the first step of nitrification process?			
	A.	$NH4^{++}1.5O2 \rightarrow NO2^{-}+2H^{+}+H2O$	B.	$NO2^{-}+0.5O2 \rightarrow NO3^{+}$
	C.	$NH4^{++}1.5O2 \rightarrow NO2^{-}+2H^{+}+H2O$	D.	None of the above

42	In which process nitrifications occur?			
	A.	TF	B.	RBC
	C.	A&B	D.	None of the above

43	What is the residential time considered for the sequence batch reactor for the removal of nitrogen?			
	A.	42-45 days	B.	32-52 days
	C.	10-32 days	D.	52-72 days

44	While designing SBR for the removal of nitrogen what is the MLVSS in mg/L assumed?			
	A.	7000-9000	B.	9000-10000
	C.	3000-500	D.	60000

45	What is the minimum amount of dissolved oxygen required for nitrification?			
	A.	0.5 mg/L	B.	1.0 mg/L
	C.	1.5 mg/L	D.	2.0 mg/L

46	Which factor affecting nitrification process?			
	A.	Temperature	B.	Ph
	C.	DO	D.	All of the above

47	What is the stripping factor assumed for the ammonia stripping tower to remove volatile organic carbon?			
	A.	1.5-5	B.	5-9
	C.	9-13	D.	13-17

48	Which is a stage of nitrogen cycle?			
	A.	Nitrogen fixation	B.	Nitrification

	C.	Assimilation	D.	All of the above

49	Nitrification is an aerobic process performed by small groups of _____bacteria			
	A.	Autotrophic	B.	Mesotrophic
	C.	A&B	D.	None of the above

50	Which is a last step of nitrification process?			
	A.	$NO^{2-}+0.5O_2 \rightarrow NO^{3+}$	B.	$NH^{4+}+1.5O_2 \rightarrow NO^{2-}+2H^{+}+H_2O$
	C.	$NH^{4+}+2O_2 \rightarrow NO_3-+2H^{+}+H_2O$	D.	None of the above

QUESTION NO	ANSWER
1	C
2	A
3	B
4	B
5	A
6	D
7	D
8	B
9	A
10	D
11	D
12	B
13	B
14	D
15	A
16	B
17	A
18	A
19	B
20	A
21	A
22	B
23	A
24	A
25	A
26	D
27	D
28	C
29	B
30	D
31	A
32	C
33	D
34	A
35	A
36	A
37	C
38	A
39	A
40	A
41	C
42	C
43	C
44	C
45	B
46	D
47	A
48	D
49	A
50	C

UNIT :- 6

1	How many phase involved in bacterial growth curve?			
	A.	1	B.	2
	C.	3	D.	4

2	Microbial growth kinetics explains the relationship between the _____of a microbe and its _____			
	A.	Specific growth rate, substrate concentration	B.	Specific growth Phase, substrate concentration
	C.	A&B	D.	None of the above

3	Estimate the value of "rX", which is the volumetric rate of biomass production.			
	A.	kg m-1 s-1	B.	kg ms^{-1}
	C.	kg m-3s-1	D.	kg m-3s-3

4	The portion of the growth curve where a rapid growth of bacteria is observed is known as _____			
	A.	Lag phase	B.	Logarithmic phase
	C.	Stationary phase	D.	Decline phase

5	Which of the following is an indirect method for measuring bacterial growth?			
	A.	Cell count	B.	Cell mass
	C.	Cell mass	D.	Both Cell mass and

6	Which phase has the condition of specific growth rate "$\mu = 0$"?			
	A.	Lag phase	B.	Logarithmic phase
	C.	Stationary phase	D.	Decline phase

7	Which phase has the condition of specific growth rate "$\mu \approx \mu max$"?			
	A.	Lag phase	B.	Logarithmic phase
	C.	Growth phase	D.	Decline phase

8	Which condition is correct according to the growth of cells in beginning?			
	A.	Cells are in small amount	B.	Cells are in medium amount
	C.	Cells are in large amount	D.	Cells are negligible in amount

9	Which of the following method is used for viable count of a culture?			
	A.	Direct microscopic count	B.	Plate-count method

	C.	Membrane-filter count	D.	Plate-count method and membrane-filter count

10	The growth of bacterial population follows _____			
	A.	Geometric progression	B.	Arithmetic progression
	C.	A&B	D.	None of the above

11	The lag phase constitute of _____			
	A.	No change in number, but an increase in mass	B.	Change in number but decrease in mass
	C.	No change in number and decrease in mass	D.	Constant number and mass

12	The number of bacteria per ml depends on the _____of the sample.			
	A.	Dilution	B.	Weight
	C.	Volume	D.	Density

13	What do you mean by the term “Ks”?			
	A.	Saturation constant	B.	Half saturation constant
	C.	Variable shape constant	D.	Solution constant

14	The yield coefficient is not used in growth kinetic relationship of which of the following growth kinetics?			
	A.	Zero order kinetics	B.	First order kinetics
	C.	Second order kinetics	D.	Monod’s kinetics

15	In the growth equation: n= 3.3 (log10 N – log10 No), n stands for_____			
	A.	total population	B.	initial population
	C.	number of generations	D.	growth constant

16	In the accelerated phase, cell starts to _____			
	A.	increase and the division rate increases to reach a maximum	B.	decrease and the division rate increases to reach a maximum
	C.	increase and the division rate decreases to reach a maximum	D.	increase and the division rate increases to reach a minimum

17	How many grams of carbon is/are in one mole?			
	A.	1 gram	B.	2 grams
	C.	12 grams	D.	100 grams

18	Which of the following equation describes the relationship between μ and residual growth limiting substrate?			
	A.	Eyring equation	B.	Van't Hoff equation
	C.	Arrhenius equation	D.	Monad equation

19	The monod equation is based on which type of kinetics?			
	A.	Zero order kinetics	B.	First-order kinetics
	C.	Second order kinetics	D.	First-zero order kinetics

20	Which of the following is used to grow bacterial culture continuously?			
	A.	Chemostat	B.	Hemostat
	C.	Coulter-Counter	D.	Turbidostat

21	The average size of cells during exponential phase of growth is _____			
	A.	Greater than the lag phase	B.	Lesser than the lag phase
	C.	Equal to lag phase	D.	Constant

22	In a viable plate count, each ___represents a ___from the sample population.			
	A.	cell, colony	B.	colony, cell
	C.	hour, generation	D.	cell, generation

23	What do you mean by the low Ks value?			
	A.	Low affinity for the limiting substrate	B.	Medium affinity for the limiting substrate
	C.	High affinity for the limiting substrate	D.	No affinity for the limiting substrate

24	The biomass concentration is at the highest level in which phase?			
	A.	Lag phase	B.	Log phase
	C.	Exponential phase	D.	Stationary phase

25	Lag phase is also known as _____			
	A.	period of initial adjustment	B.	transitional period
	C.	generation time	D.	period of rapid growth

26	Which of the following phase is known as the "Maximum population phase"?			
	A.	Lag phase	B.	Log phase
	C.	Exponential phase	D.	Stationary phase

27	The time required for a cell to undergo binary fission is called the			
	A.	exponential growth rate	B.	growth curve

	C.	generation time	D.	lag period

28	In a binary fission, the parent cell division to form			
	A.	2 progeny cell	B.	4 progeny cell
	C.	8 progeny cell	D.	16 progeny cell
29	What is the unit of Maintenance coefficient "m"?			
	A.	kg substrate (kg biomass) S^{-1}	B.	kg substrate (kg biomass) S
	C.	kg substrate (kg biomass)$^{-1}$ S^{-1}	D.	kg substrate (kg biomass)$^{-1}$ S

30	The generation time for E.coli is _____			
	A.	20 minutes	B.	35 minutes
	C.	2 minutes	D.	13 minutes

31	The amount of substrate within the cells per unit of cell dry weight is called			
	A.	Substrate concentration	B.	Saturation constant
	C.	Maximum growth rate	D.	All of the above

32	$\mu = \mu_{max}$ x (S/(K_s x S)) in which unit of μ_{max}_____			
	A.	1/meter	B.	1/kg
	C.	1/time	D.	1/ml

33	The growth rate slow down due to toxic product _____phase			
	A.	Lag phase	B.	Logarithmic phase
	C.	Stationary phase	D.	Decline phase

34	How many test involved on MPN test			
	A.	1	B.	2
	C.	3	D.	4

35	During exponential phase, growth rate is _____			
	A.	same as generation time	B.	reciprocal of generation time
	C.	time required for population to double	D.	rate of doubling population

36	Full form of MPN			
	A.	Most Probable Number	B.	Most Pollution Number
	C.	Most Passive Number	D.	None of the above

37	Specific growth rate measure _____

	A.	Number of divisions per cell per unit time	B.	Number of divisions per molecule per unit time
	C.	A&B	D.	None of the above

38	The average size of the cells in the exponential phase is _____			
	A.	larger than the initial size	B.	smaller than the initial size
	C.	equal to the initial size	D.	maybe smaller or larger than the initial size

39	Which of the following is a better test to identify Coliforms?			
	A.	Coliform index	B.	Multiple tube fermentation
	C.	MPN test	D.	Membrane filter technique

40	In which of the following phase secondary metabolites are produced during growth?			
	A.	Lag phase	B.	Log/Exponential phase
	C.	Stationary phase	D.	Death phase

41	What is the temperature at which MPN test is performed?			
	A.	35^{o}C	B.	37 ^{o}C
	C.	40^{o}C	D.	45 ^{o}C

42	Which of the following is the disease caused by bacterial infections?			
	A.	Amoebic dysentery	B.	Infectious hepatitis
	C.	Typhoid fever	D.	Poliomyelitis

43	In the death phase, there is a remarkable decreased in the number of			
	A.	Bacteria	B.	Viable Bacteria
	C.	Dividing Bacteria	D.	None of the above

44	If the acid and gas are formed in the multiple tube fermentation technique, the test is _____			
	A.	Positive	B.	Continued
	C.	Negative	D.	Discarded

45	Which phase shows reproduction rate equal to the equivalent death rate?			
	A.	Log phase	B.	Stationary phase
	C.	Death phase	D.	Lag phase

46	Which step include in MPN test?			
	A.	Presumptive test	B.	Confirmatory test
	C.	Completed test	D.	All of the above

47	The reproduction of Bacteria usually undergoes a_____			
	A.	Sexual reproduction	B.	Binary fission
	C.	Budding	D.	None of the above

48	Which are the advantages of MPN test?			
	A.	Ease of interpretation	B.	that cannot be analyzed by membrane filtration
	C.	Effective method of analyzing highly turbid samples	D.	All of the above

49	Which are the disadvantages of MPN test?			
	A.	It takes a long time to get the results	B.	Results are not very accurate
	C.	Requires more hardware (glassware) and media	D.	All of the above

50	How much time required for MPN test?			
	A.	1 day	B.	1 hours
	C.	24 day	D.	None of the above

QUESTION NO	ANSWER
1	**D**
2	**A**
3	**C**
4	**B**
5	**C**
6	**D**
7	**C**
8	**A**
9	**D**
10	**C**
11	**A**
12	**A**
13	**B**
14	**C**
15	**C**
16	**A**
17	**C**
18	**D**
19	**D**
20	**A**
21	**B**

25	**A**
26	**D**
27	**C**
28	**A**
29	**D**
30	**A**
31	**A**
32	**C**
33	**C**
34	**C**
35	**B**
36	**A**
37	**A**
38	**B**
39	**D**
40	**C**
41	**B**
42	**C**
43	**B**
44	**A**
45	**B**
46	**D**
47	**B**

22	**B**
23	**C**
24	**C**

48	**D**
49	**D**
50	**A**