Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Environmental Engineering
Objective Type Questions (Air Pollution Control Management)

Chapter-1	
1	Particulates(<1µm size) remaining suspended in air indefinitely and transported by wind currents are called a-fumes b-mists c-smoke d-aerosols Ans-d
2	How does carbon monoxide affect the human body? a- It does not allow binding of oxygen with hemoglobin b-It reduces the surface area of the alveoli and disrupts gaseous transfers c- It causes the liver to malfunction, increasing bile secretion d- It reduces the body's tendency to absorb water thereby making us feel dehydrated Ans-a
3	What is the effect of ozone on human respiratory system? a- It has higher affinity to bind with hemoglobin and does not allow binding of oxygen b- It causes the disfigurement of the alveoli reducing the surface area for gaseous transfer c- It damages lung tissues and aggravates asthma d- All of the mentioned Ans-c
4	What are the effects of sulphur dioxide on the human body? a- It causes the malfunction of liver and kidney

	b-It breaks down body's immunity towards particulate matter and bacteria c-It causes blood cells to dilate thereby affecting blood flow through the circulatory system d- All of the mentioned Ans-b
5	How does increase in temperature affect air pollution? a- Higher temperatures reduce air pollution b- Higher temperatures increase air pollution c- Temperature does not affect the air pollution levels d- Humidity factor is also necessary to predict variance of air pollution with temperature Ans-b
6	Which of the following is an organic gas? a-Hydrocarbons b-Aldehydes c-Ketones d-Ammonia Ans-d
7	Which of the following is/are inorganic gas (es)? a-Carbon monoxide b-Hydrogen sulphide c-Chlorine d-All of the above Ans-d
8	The principal source of volatile organics (Hydrocarbons) is

	a-Transportation b-Industrial processes c-Stationary fuel combustion d-Volcanoes Ans-b
9	Which are the following sources known as mobile sources? a-cars b-buses c-planes d-all of the above Ans-d
10	Which are the following sources known as stationary sources? a- power plants b- oil refineries c- industrial facilities d-all of the above Ans-d
11	Which are the following sources known as area sources? a-agricultural areas b-cities c-wood burning fireplaces d-all of the above Ans-d
12	Which are the following sources known as natural sources? a-wind-blown dust b-wildfires

	c-volcanoes d-all of the above Ans-d
13	Which of the following air pollutant effects plants the most? a-Fluorine b- SO_2 c- PAN d- HCl Ans-a
14	Exposure to small amount of_____results in high blood pressure & heart disease in human beings. a- hydrogen sulphide b- mercury c-cadmium d-asbestos Ans-c
15	SMOG is derived from a-Smoke b-Fog c-Both A and B d-Only A Ans -c
16	Which of the following is responsible for turning yellow Taj Mahal? a- Nitrogen dioxide b-Sulphur

	c-Chlorine d-Sulphur dioxide Ans-d
17	The boiler flue gas is source of a- HCl b-NO c-HF d-Volatile organic compounds Ans-b
18	The major contributor of Carbon monoxide is a-Motor vehicle b-Industrial processes c-Stationary fuel combustion d-None of the above Ans-a
19	Which gas is mainly produced due to incomplete burning of wood? a- CO b-SO2 c-NO2 d-NO3 Ans-a
20	The maximum size of fly ash is a-1μm b- 0μm c- 0μm

	d-10μm Ans-c
21	Which is the largest source for production of nitrous oxide? a-Chemical industry b-Fertilizer industry c-Fossil fuel combustion d-Bacterial action Ans-d
22	Which of these is NOT a primary pollutant? a-Carbon monoxide b- Carbon dioxide c- Ground level ozone d- Oxygen Ans-d
23	What percentage of pollutants is gaseous in nature? a) 75% b) 80% c) 99.9% d) 90% Ans-d
24	Which of these belongs to the category of criteria pollutants? a) Ozone b) Lead c) Carbon monoxide d) All of the mentioned Ans-d

25	Which of the following are classified as major sources to air pollution? a) Fuel consumption by local citizens b) Sewage treatment plants c) Dry cleaning and laundries d) None of the mentioned Ans-b
26	Which of the following gases has the highest affinity for blood hemoglobin? a) Carbon dioxide b) Oxygen c) Carbon monoxide d) Nitrogen Ans-c
27	Which is the major source for sulphur dioxide? a) Volcanic eruptions b) Coal and crude oil combustion c) Burning of petrol d) Sewage treatment process Ans-b
28	Pesticides also contribute to air pollution along with polluting underground reservoirs. a) True b) False Ans-a
29	Which of the following is a liquid form of aerosol?

	a) Fume b) Dust c) Mist d) Smoke Ans-c
30	The minimum size of the smoke particle is a) 0.2μm b) 1μm c) 0.8μm d) 0.5μm Ans-d
31	Air pollutants can be classified as : a-natural contaminants b-aerosols c-gases and vapors d-all of the above Ans-d
32	Which of the following not fall in Aerosols? a-dust b-pollen grains c-smoke d-mist Ans-b
33	Which of the following is not a primary pollutant? a-carbon monoxide b-oxides of nitrogen

	c-photochemical smog d- coarse particles Ans-c
34	___is made up of solid particles predominantly larger than those found in colloid. a-dust b-smoke c-mist d-fog Ans-a
35	__consist of finely divided particles produced by incomplete combustion. a-dust b-smoke c-mist d-fog Ans-b
36	___refers to visible aerosols in which the dispersed phase is liquid. a-dust b-smoke c-mist d-fog Ans-d
37	___is a low concentration dispersion of liquid particles of large size.

	a-dust b-smoke c-mist d-fog Ans-c
38	__are solid particles generated by condensation from the gaseous state. a-dust b-fumes c-mist d-fog Ans-b
39	Industrial processing and power plant are fall in which category? a-point source b-line source c-area source d-none of the above Ans-a
40	Residential and open burning is fall in which category? a-point source b-line source c-area source d-none of the above Ans-c
41	Highway vehicles, Railroads and channel vessels are fall in which category?

	a-point source b-line source c-area source d-none of the above Ans-b
42	Which of the following not fall in area sources? a-onsite incineration b-open burning c-fuel combustion d-all of the above Ans-c
43	Which of the following not fall in point sources? a-onsite incineration b-industrial processing c-solid waste disposal d-all of the above Ans-a
44	__refers to the dispersion of solid or liquid particles of microscopic size in gaseous media such as dust smoke or mist. a-gases b-aerosols c-natural contaminant d-none of the above Ans-b
45	Which of the following is natural contaminant? a-natural fog

	b-pollen grains c-bacteria d-all of the above Ans-d
46	Which of the following is not natural contaminant? a-natural fog b-pollen grains c-bacteria d-mist Ans-d
47	Fog from burning coal covers urban area a-during day b-during night c-both a and b d-none of the above Ans-b
48	Which of the following are the sources of carbon monoxide? a-CO comes from vehicular exhaust b-from industrial process c-volcano eruption d-all of the above Ans-d
49	Which of the following are the sources of hydrocarbons? a-oil refining b-paint manufacture c-forest and coal waste fire

	d-all of the above Ans-d
50	Which of the following are not the sources of hydrocarbons? a-oil refining b-paint manufacture c-volcano eruption d- forest and coal waste fire Ans-c

Chapter-6	
1	The function of automobile catalytic converter is to control emissions of a-carbon dioxide and hydrogen b-carbon monoxide and hydrogen c-carbon monoxide and carbon dioxide d-carbon monoxide and nitrogen dioxide Ans-b
2	Which of the following pollutants is the major contributor to photochemical smog? a) Peroxynitrates b) Hydroperoxides c) Nitrogen dioxide d) Ozone Ans-d
3	Which of the following is not a part of photochemical smog?

	a) NO_2 b) O_3 c) PAN d) SPM Ans-d
4	What are various approaches to minimize exhaust emission? a-modification in the engine design b- modification in the operating variables. c-treatment of exhaust gases after emission from engines. d-all of the above Ans-d
5	Which of the following are two main source of evaporation emission : a-engine, fuel tank b-fuel tank, carburattor c-carburrator, engine d-none of the above Ans-b
6	A decrease in the air fuel ratio : a-decrease hydrocarbon content b-increase hydrocarbon content c-both a and b d-none of the above Ans-b
7	The exhaust HC decreases with the: a-decrease in combustion ratio

	b-increase in combustion ratio c-both a and b d-none of the above Ans- decrease in combustion ratio
8	Which of the following are two HC most greatly affected by AF ratio: a-methane and acetic acid b-methane and acetylene c-ethane and acetic acid d-acetic acid and acetylene Ans-b
9	A 10^{o} spark retard from the optimum economy value causes how much reduction? a-8-10 % b-7-18 % c-7-15 % d-8-15 % Ans-b
10	Hydrocarbon emission can be largely eliminated by positive crank case ventilation (PCV) system. a-true b-false Ans-a
11	Exhaust emission vary from: a-air-fuel ratio b-spark timings

	c-engine operating condition d-all of the above Ans-d
12	In_emission air is injected near the exhaust valves, where exhaust gas temperature is highest. a-crank-case b-evaporative c-exhaust d-none of the above Ans-c
13	Devices used to control hydrocarbon emission fall under which categories: a-device that modify engine operation b-device that treat exhaust gases c-use of modified or alternate fuels d-all of the above Ans-d
14	Devices used to control hydrocarbon emission fall under which categories: a-device that modify engine operation b-device that treat exhaust gases c-use of modified or alternate fuels d-all of the above Ans-d
15	Devices used to control hydrocarbon emission fall under which categories:

	a-device that modify engine operation b-device that treat exhaust gases c-both a and b d-none of the above Ans-c
16	___emission consist of engine blow-by which leaks past the piston mainly during the compression stroke. a-crank-case b-evaporative c-exhaust d-none of the above Ans-a
17	The quality of blow-by depends on : a-engine design b-engine shape c-engine operating condition d-both a and c Ans-d
18	Hydrocarbon emission can be largely eliminated by a-GCV system b-ACV system c-PCV system d-LCV system Ans-c
19	By which system, Hydrocarbon emission can be largely eliminated:

	a-GCV system b-ACV system c-PCV system d-LCV system Ans-c
20	PCV system recycle___ventilation air a-crank-case b-evaporative c-exhaust d-none of the above Ans-a
21	In crank-case emission blow-by gases mainly contains hydrocarbon and account nearly___% of the total hydrocarbon emission. a-30 b-25 c-45 d-40 Ans-b
22	In_emission blow-by gases mainly contains hydrocarbon and account nearly 25% of the total hydrocarbon emission. a-crank-case b-evaporative c-exhaust d-none of the above Ans-a

23	___emission determined by experiment that an average Indian passenger car emits 20 kg hydrocarbon annually through evaporation. a-crank-case b-evaporative c-exhaust d-none of the above Ans-b
24	Evaporative emission determined by experiment that an average Indian passenger car emits_kg hydrocarbon annually through evaporation. a-20 b-30 c-40 d-50 Ans-a
25	___emission dealt with the changing properties of gasoline. a-crank-case b-evaporative c-exhaust d-none of the above Ans-b
26	Which methods can be used to control evaporative emission? a-chemical b-mechanical c-electrical

	d-all of the above Ans-b
27	Exhaust emission contribute____% to CO, NO_x and lead compounds a-90 b-100 c-80 d-50 Ans-b
28	In evaporative emission replacing C4 and C5 olefinic hydrocarbon with ____ a-C4 and C5 paraffinic hydrocarbon b-C3 and C4 paraffinic hydrocarbon c-C1 and C2 paraffinic hydrocarbon d-all of the above Ans-a
29	Modification in the engine design and operating variables include: a-use of leaner mixtures b-use of minimum valve c-pre-treatment of mixture to improve vaporization d-all of the above Ans-d
30	Modification in the engine design and operating variables include: a-use of leaner mixtures

	b-use of minimum valve c-both a and b d-none of the above Ans-c
31	Exhaust treatment devices include: a-promotion of after burning of the pollutant by exhaust heat conservation b-use of catalytic convertors c-both a and b d-none of the above Ans-c
32	In minimizing evaporative emission, principle factors affecting tank emission are a-fuel volatility b-tank design c-tank location d-none of the above Ans-a
33	Which of the following factors that affects tank emission during minimization of evaporative emission? a-fuel volatility b-tank design c-tank location d-all of the above Ans-d
34	In carburetor emission, running losses occurring during :

	a-engine cleaning b-engine starting c-engine operation d-engine modification Ans-c
35	In carburetor emission, hot soak losses occurring during : a-vehicle is in running position b-vehicle is in stationary position c-both a and b d-none of the above Ans-b
36	Carburetor emission divided into how much categories? a-2 b-3 c-4 d-5 Ans-a
37	Carburetor emission divided into two categories. a-running losses b-hot soak losses c-both a an b d-working losses Ans-c
38	Which losses are insufficient in carburetor emission? a-running losses b-hot soak losses

	c-both a an b d-working losses Ans-a
39	According to an experiment hydrocarbon concentration measured with a-ultraviolet analysis b-infra-red analysis c-gas chromatography analysis d-none of the above Ans-b
40	Insulation of tank is provided to reduce: a-temperature b-pressure c-vaporization d-all of the above Ans-a
41	A decrease in AF ratio increases: a-HC content b-VC content c-both a and b d-none of the above Ans-a
42	According to an experiment a single cylinder engine operating at full throttle on___was used. a-propane b-ethane

	c-hexane d-all of the above Ans-a
43	HC emission generally decreases as the spark is a-retarded at constant power b-accelerate at constant power c-both a and b d-stop during power failure Ans-a
44	In spark timing, HC emission reduction measured by a-infra-red analyzer b-flame ionization analyzer c- ultraviolet analyzer d-all of the above Ans-b
45	Which engine operate on fuel of low octane a-wrankle engine b-pancake engine c-radial engine d-none of the above Ans-a
46	In wrankle engine NO_x emission are___% a-35 b-30 c-40 d-45

	Ans-b
47	In wrankle engine temperature of exhaust gas being higher by____ a-120 ºC b-150 ºC c-170 ºC d-190 ºC Ans-b
48	CNG essentially eliminate the pollutants but the disadvantage is: a-supply and proved reserve are limited b-maintenance is difficult c-easily not available d-both b and c Ans-a
49	Which of the following are used as a recent development in automobile industry? a-Wrankle engine b-CNG c-Electric car d-all of the above Ans-d
50	Which of the following are important emissions from gasoline engine? a-monoxide b-unburnt hydrocarbon

	c-nitrogen oxide d-all of the above Ans-d

Chapter-2	
1	Coning plume occurs under which conditions? a) Super adiabatic b) Sub adiabatic c) Neutral d) Inversion Ans-b
2	In which of the following plumes, stable condition prevails? a) Lofting b) Fanning c) Neutral d) Fumigating Ans-b
3	The upward vertical rise prevails in which of the following plume? a) Trapping b) Fanning c) Looping d) Neutral Ans-d
4	Which of the following plume is worst for the dispersion of pollutants?

	a) Trapping b) Fanning c) Neutral d) Fumigating Ans-d
5	In which of the following plumes, unstable condition prevails? a) Trapping b) Fanning c) Looping d) Neutral Ans-c
6	Which of the following are contradictory plume? a) Lofting and fumigating b) Looping and coning c) Neutral and lofting d) Fumigating and trapping Ans-a
7	What does the word 'meteorology' define? a) Study of meteors and asteroids b) Study of measurements and instruments c) Study of chemical properties of metals d) Study of the weather and atmospheric changes Ans-d
8	How does atmospheric pressure vary with increase in altitude? a) It decreases linearly b) It decreases exponentially

	c) It increases linearly d) It increases till stratosphere and then starts decreasing exponentially Ans-b
9	Which of the following is regarded as climate control factor(s)? a) Latitude b) Elevation c) Ocean currents d) All of the mentioned Ans-d
10	Greater the Air Quality Index of a region, more polluted is the air. a) True b) False Ans-a
11	Fugitive emissions consist of a-Street dust b-Dust from construction activities c-Dust from farm cultivation d-All of the above Ans-d
12	Which are not fall in primary parameters of meteorology a-wind direction and speed b-temperature c-mixing height d-humidity

	Ans-d
13	Which are fall in primary parameters of meteorology a-wind direction and speed b-atmospheric stability c-mixing height d-all of the above Ans-d
14	Which are not fall in secondary parameters of meteorology a-precipitation b- mixing height c-visibility d-humidity Ans-b
15	Which are fall in secondary parameters of meteorology a-precipitation b- solar radiation c- humidity d-all of the above Ans-d
16	Any one of a class of diagram designed to show the distribution of wind direction experienced at a given location over a considerable period known as wind rose. a-true b-false Ans-a
17	In wind rose diagram, the most common form consists of a

	circle from which how much lines emerge one for each direction. a-8 b-16 c- both a and b d-only a Ans-c
18	Special wind roses are sometimes constructed like: a-precipitation wind rose b-smoke wind rose c-hydrocarbons wind rose d-all of the above Ans-d
19	From below which are not Special wind roses: a-precipitation wind rose b- chlorine wind rose c- nitrogen oxide wind rose d-both b and c Ans-d
20	Environmental lapse rate means: a-the rate at which air temperature decreases with elevation b- the rate at which air temperature increases with elevation c-both a and b d-only b Ans-a
21	Environmental lapse rate means: the rate at which air

	temperature decreases with elevation a-true b-false Ans-a
22	Environmental lapse rate decreases faster when a-air is unstable than stable b-air is stable then unstable c-both a and b d-none of the above Ans-a
23	How much types of inversion is present in atmosphere a-3 b-4 c-2 d-5 Ans-c
24	Subsidence inversion occurs when a-at night b-during day c-both a and b d-at modest Ans-d
25	Radiation inversion occurs when a-at night b-during day c-both a and b

	d-at modest Ans-a
26	Mixing height can be defined as height above the earth surface to which related pollutant will extent primary through the action of atmospheric turbulence. a-true b-false Ans-a
27	In well mixed air which is dry, for every 1000 ft increase in altitude the temperature decreases by about a-3.4 ^{o}F b-3.3 ^{o}F c-3.6 ^{o}F d-3.8 ^{o}F Ans-b
28	In well mixed air which is dry, for every 1000 ft increase in altitude the temperature decreases by about a-1.2 ^{o}C b-1.5 ^{o}C c-1.8 ^{o}C d-2.0 ^{o}C Ans-c
29	When strong lapse rate above a surface inversion then which condition occurs: a-lofting b-fanning

	c-trapping d-none of the above Ans-a
30	Which type of plume have a wavy character: a-coning b-looping c-lofting d-fanning Ans-b
31	Which type of plume have shaped like a cone: a-coning b-looping c-lofting d-fanning Ans-a
32	Which type of plume emitted under extreme inversion condition: a-coning b-looping c-lofting d-fanning Ans-d
33	The application of dispersion parameters theory and a knowledge of local weather conditions are necessary to determine: a-stack height

	b-intensity of air pollution c-both a and b d-only b Ans-c
34	Which meteorological parameters influence air pollutant: a-temperature, precipitation b-atmospheric stability, mixing height c-visibility, solar radiation d-all of the above
35	When environmental Lapse Rate (ELR) is equal to the Adiabatic Lapse Rate (ALR), then which of the following occurs? a) Sub adiabatic lapse rate b) Super adiabatic lapse rate c) Neutral lapse rate d) Adiabatic lapse rate Ans-c
36	The wet adiabatic rate is greater than the dry adiabatic rate. a) True b) False Ans-b
37	When Environmental Lapse Rate (ELR) is greater than Adiabatic Lapse Rate (ALR), then which of the following occurs? a) Sub adiabatic lapse rate b) Super adiabatic lapse rate

	c) Neutral lapse rate d) Adiabatic lapse rate Ans-b
38	___is known as the degree to which air pollutants discharged from various sources concentrate in particular area. a-meteorological condition b-neutral condition c-adiabatic condition d-stable condition Ans-a
39	Who has developed wind speed recorder? a-SEO b-NEERI c-CPCB d-GCPC Ans-b
40	In wind speed recorder___cup rotor is employed. a-3 b-5 c-4 d-6 Ans-c
41	__is automatic and operated mechanically without any power supply. a-wind direction recorder b-wind speed recorder

	c-both a and b d-none of the above Ans-a
42	__is known as the rate at which air temperature decreases with elevation. a-Environmental lapse rate b-Adiabatic lapse rate c-Inversion d-All of the above Ans-a
43	Inversion below lapse aloft condition also known as a-looping b-coning c-lofting d-fanning Ans-c
44	Weak lapse condition also known as a-looping b-coning c-lofting d-fanning Ans-b
45	Between inversion also known as a-looping b-trapping c-lofting

	d-fanning Ans-b
46	Strong lapse condition is also known as a-looping b-trapping c-lofting d-fanning Ans-a
47	Inversion above lapse aloft condition also known as a-looping b-coning c-fumigation d-fanning Ans-c
48	If the air is moist and its temperature is below the dew point __will form. a-fog b-mist c-smog d-all of the above Ans-a
49	___type of inversion is more common in winter than in summer. a-radiation b-subsidence c-both a and b d-none of the above

	Ans-a
50	When both subsidence and radiation inversion occur simultaneously such a phenomenon is known as: a-natural inversion b-double inversion c-neutral inversion d-none of the above Ans-b
51	When environmental Lapse Rate (ELR) is less is than Adiabatic Lapse Rate (ALR), then which of the following occurs? a) Sub adiabatic lapse rate b) Super adiabatic lapse rate c) Neutral lapse rate d) Adiabatic lapse rate Ans-a
52	_____occurs when atmospheric temperature increases with height. a) Negative lapse rate b) Super adiabatic lapse rate c) Neutral lapse rate d) Positive lapse rate Ans-d

Chapter-3	
1	Which of the following pollutants are considered when measuring air quality? a- CO, O_3, $PM_{2.5}$ b- NH_3, PM_{10}, Pb c- NO_2, SO_2 d- All of the mentioned Ans-d
2	Hazardous pollutants are those pollutants for which air quality standards have been devised. a) True b) False Ans-b
3	What does the abbreviation VOC stand for? a) Versatile Oxygenated Compounds b) Volatile Oxygenated Compounds c) Volatile Organic Carbons d) Volatile Organic Compounds Ans-d
4	The principal source of volatile organics (Hydrocarbons) is a-Transportation b-Industrial processes c-Stationary fuel combustion d-Volcanoes Ans-b

5	The permissible concentration of PM 10 in the air is

	a-60μg/m^3 b-40μg/m^3 c-50μg/m^3 d-20μg/m^3 Ans-a
6	The permissible concentration of PM 2.5 in the air is a-60μg/m^3 b-40μg/m^3 c-50μg/m^3 d-20μg/m^3 Ans-b
7	How many parameters are taken into consideration when measuring air quality, in India? a) 4 b) 3 c) 8 d) 9 Ans-c
8	In freeze-out sampling a series of cold traps which are maintained at progressively lower temperature are used to draw the air sample whereby the pollutant are condensed. a-true b-false Ans-a
9	Dust fall jar/ sedimentation used for collect the particles having

	size a- larger than 10 micrometer b- smaller than 10 micrometer c- larger than 50 micrometer d- smaller than 50 micrometer Ans-a
10	In sedimentation collector consist of plastic jar of: a-20 to 30 cm height b-20 to 35 cm height c-30 to 40 cm height d-30 to 45 cm height Ans-b
11	In sedimentation collector consist of plastic jar of: a-10-15 cm dia b-20-25 cm dia c-10-20 cm dia d-15-20 cm dia Ans-a
12	In high volume filtration sampling time is: a-8 hrs b-24 hrs c-16 hrs d-none of the above Ans-b
13	During 24 hrs sampling in high volume filtration, how much air is sucked through the filter.

	a-1000 m3 b-3000 m3 c-2000 m3 d-4000 m3 Ans-c
15	Absorption separates the desired pollutant from air either through _____ a-direct solubility in the absorbing medium b-by chemical reaction c-both a and b d-none of the above Ans-c
16	Absorption separates the desired pollutant from air either through _____ a-direct solubility in the absorbing medium b-impingement c-glass collectors d-none of the above Ans-a
17	Absorption separates the desired pollutant from air either through _____ a-by chemical reaction b-impingement c-glass collectors d-none of the above Ans-a

18	Which of the following types are of impinger? a-simple bubbler b-disc type c-tip type d-all of the above Ans-d
19	Which of the following types are of impinger? a-midget type b-disc type c-green bug-smith type d-all of the above Ans-d
20	Impinger devices can handle sample flow rate of about_per minute respectively. a-40 and 4 litres b-30 and 3 litres c-30 and 4 litres d-40 and 5 litres Ans-b
21	Grab sampling used for collection of_____ a-solid particles b-liquid particles c-gaseous particles d-all of the above Ans-c
22	Freezed-out sampling used for collection of_____

	a-solid particles b-liquid particles c-gaseous particles d-all of the above Ans-c
23	In which sampling a series of cold traps which are maintained at progressively lower temperature are used to draw the air sample whereby the pollutants are condensed? a-grab sampling b-freezed-out sampling c-dust fall jar sampling d-high volume filtration Ans-b
24	In freezed-out sampling a series of cold traps which are maintained at progressively_____are used to draw the air sample whereby the pollutants are condensed? a-lower temperature b- higher temperature c-medium temperature d-all of the above Ans-a
25	Dust fall jar or sedimentation device used for sampling particles a-<10 μm b->10 μm c-<5 μm d->5 μm

	Ans-b
26	The most commonly used solid adsorbent a-activated alumina b-activated charcoal c-activated carbon d-zeolites Ans-b
27	The most commonly used solid adsorbent a-activated alumina b-silica gel c-activated carbon d-zeolites Ans-b
28	Which of the following are used as a solid adsorbent? a-activated alumina b-silica gel c-activated carbon d-all of the above Ans-d
29	In freezed-out sampling traps are bought to the laboratory after collection of sample and analyzed by means of _____ a-gas chromatography b-infrared spectrophotometer c-by wet chemical means d-all of the above Ans-d

30	In dust fall jar or sedimentation, sample is deposited over a period of one month and material is dried weighed usually in a-mg/cm^2 b-g/cm^2 c-mg/km^2 d-g/m^2 Ans-a
31	In dust fall jar or sedimentation, sample is deposited over a period of one month and material is dried weighed usually in a-tons/ km^2 b-g/cm^2 c-mg/km^2 d-g/m^2 Ans-a
32	In high volume filtration filter usually made of a- fibrous material b-ceramic material c-polymer material d-metal material Ans-a
33	Glass fibre filter used in High volume filtration has efficiency of ___ a-90 % b-99 % c-80 % d-100 %

	Ans-b
34	Glass fibre filter used in High volume filtration has efficiency of 99 % trapping particles as small size as _____ a-0.5 µm b-0.05 µm c-0.1 µm d-0.01 µm Ans-b
35	Which device have efficiency of 99 % trapping particles as small size as 0.05 µm? a-sedimentation b-high volume filtration c-grab sampling d-freezed-out sampling Ans-b
36	___impingement is used for collection of particulates in a liquid phase. a-dry b-wet c-both a and b d-none of the above Ans-b
37	___impingement is used for collection of particulates on a dry surface a-dry b-wet

	c-both a and b d-none of the above Ans-a
38	Dry impingement is used for collection of particulates on a dry surface operate on the principle of a-diffusion b-interception c-impaction d-attraction Ans-c
39	Which of the following points should be considered in particulate matter sampling? a-determine empty weight of the thimble b-check all points for leakages c-determine the flow rate to be sample d-all of the above Ans-d
40	Which of the following points should be considered in particulate matter sampling? a-determine the temperature and velocity of each traverse point b-mark out the traverse point on the probe c-switch off the pump at the end of sampling time d-all of the above Ans-d
41	When the velocity in the probe is higher than that of the gas stream being sampled_____air stream will developed.

	a-convergent b-divergent c-straight d-none of the above Ans-a
42	When the velocity in the probe is lower than that of the gas stream being sampled_____air stream will developed. a-convergent b-divergent c-straight d-none of the above Ans-b
43	When the velocity in the probe is_____than that of the gas stream being sampled then divergent air stream will developed. a-higher b-lower c-normal d-none of the above Ans-b
44	When the velocity in the probe is_____than that of the gas stream being sampled then convergent air stream will developed. a-higher b-lower c-normal d-none of the above

	Ans-a
45	In which device particulate sample is filtered using a continuous filter tape is determined by measuring its attention of beta radiation? a-beta attenuation monitor b-pizo electric monitor c-electrostatic precipitator d-none of the above Ans-a
46	The sampling point should be as far as possible from any disturbing influence such as a-elbows b-bands c-transition pieces d-all of the above Ans-d
47	In high volume filtration filter usually made of a- fibrous material b-ceramic material c-polymer material d-metal material Ans-a
48	Absorption in liquid used for collection of_____ a-solid particles b-liquid particles c-gaseous particles

	d-all of the above Ans-c
49	The most common impinge are____ a-midget type b-disc type c-green bug-smith type d-both a and c Ans-d
50	A dust fall jar device also known as a-sedimentation b-gravitation c-filtration d-none of the above Ans-a

Chapter-4	
1	The maximum efficiency of the electrostatic precipitator is _____ a) 95% b) 80% c) 99% d) 100% Ans-c
2	The minimum particle size removes by the gravitational chamber is a) >50μm

	b) >10μm c) >25μm d) >0.5μm Ans-a
3	Wet scrubbers are classified into_____types. a) 2 b) 3 c) 5 d) 6 Ans-b
4	The centrifugal collectors are classified into how many types? a) 3 b) 4 c) 5 d) 2 Ans-d
5	Which of the following air pollution control device has maximum efficiency? a) Electrostatic precipitator b) Dynamic precipitator c) Spray tower d) Wet cyclonic scrubber Ans-a
6	Which of the following is incorrect regarding the fabric filter? a) They can remove very small particle b) They are liable to chemical attack

	c) They have low efficiency in comparison to venturi scrubber d) They can handle large volume of gas at relatively high speed Ans-c
7	Which of the following removes both gaseous and particulate contaminants? a) Venturi scrubber b) Gravitational settling chamber c) Dynamic precipitator d) Wet scrubber Ans-a
8	_____is the simplest equipment used for collection of solid particulates. a) Inertial separators b) Filters c) Settling chamber d) Cyclones Ans-c
9	Identify the correct statement regarding the Electrostatic precipitator. a) Minimum particle size removal is <0.5μm b) They can be operated at high temperature c) It has a low maintenance cost d) It does not cause any freezing problem Ans-b
10	Wet scrubbers are classified into_____types.

	a) 2 b) 3 c) 5 d) 6 Ans-b-
11	Settling chamber is a_and used for collection of solid particulate. a-complex equipment b-simplest equipment c-both a and b d-none of the above Ans-b
12	A structure without moving parts in which the velocity of an inlet gas stream as a transformed into a confined vortex from which centrifugal forces tend to drive the suspended particles to the wall called: a) Inertial separators b) Filters c) Settling chamber d) Cyclone separators Ans-d
13	Which of the following not fall in advantages of electrostatic precipitators: a-high collection efficiency b-low pressure drop c-high operating cost

	d-time is negligible Ans-c
14	Which of the following fall in advantages of electrostatic precipitators: a-high collection efficiency b-low pressure drop c-low operating cost d-all of the above Ans-d
15	Which of the following is not an adsorbent? a) Molecular sieves b) Activated carbon c) Activated alumina d) Water Ans-d
16	Which of the following devices is NOT used to control particulate emissions? a) Electrostatic precipitator b) Bag filters c) Catalytic converters d) All of the mentioned Ans-c
17	The temperature decreases with altitude in the stratosphere layer. a) True b) False

	Ans-b
18	Which of the following is high energy scrubber? a-packed scrubber b-mechanical scrubber c-cyclone scrubber d-venturi scrubber Ans-b
19	Operating principle of cyclone separator is based on the action of_____dust particles. a- diffusion of b- centrifugal force on c- gravitational force on d- electrostatic force on Ans-b
20	The effective height of stack is given by a) Plume height / Actual height of the stack b) Plume height * Actual height of the stack c) Plume height − Actual height of the stack d) Plume height + Actual height of the stack Ans-d
21	How does increase in temperature affect air pollution? a) Higher temperatures reduce air pollution b) Higher temperatures increase air pollution c) Temperature does not affect the air pollution levels d) Humidity factor is also necessary to predict variance of air pollution with temperature

	Ans-b
22	Which of the following are the general applications of cyclone separators? a-cement manufacture b-food and beverage c-petroleum industry d-all of the above Ans-d
23	Which of the following are not the general applications of fabric filters? a-cement manufacture b-flour mills c-petroleum industry d-foundries Ans-c
24	Which of the following are not the general applications of electrostatic precipitator? a-cement manufacture b-food and beverage c-petroleum industry d-chemical industry Ans-b
25	Which of the following are the general applications of settling chamber? a-natural draft furnaces b-kiln

	c-metallurgical industry d-all of the above Ans-d
26	___m/s gas velocity is required for good result in settling chamber. a-<0.5 m/s b->0.5 m/s c-<0.1 m/s d->0.1 m/s Ans-a
27	What are the objectives of using control equipment? a-prevention of nuisance b-recovery of valuable products c-both a and b d-none of the above Ans-c
28	Which of the following not included in properties of the carrier gas a-composition b-temperature c-visibility d-humidity Ans-c
29	Which of the following fluid is used in wet scrubbers? a) Lime b) $MgSO_4$

	c) NaCl d) $K_2Cr_2O_7$ Ans-a
30	Which of the following are demerits of cyclone? a-low collection efficiency for particles below 5-10 μ in diameter b-equipment is subject to serve abrasive deterioration c-decreasing concentration in the gas stream d-all of the above Ans-d
31	Which of the following is not the specific property of the contaminant? a-composition b- pressure c-reactivity d- solubility Ans-b
32	Which of the following are the specific properties of the contaminant? a-composition b-solubility c-reactivity d-all of the above Ans-d
33	_____removes both gaseous and particulate contaminants. a) Venturi scrubber

	b) Gravitational settling chamber c) Dynamic precipitator d) Wet scrubber Ans-a
34	____scrubber has a internal rotating mechanical part a-cyclone b-packed c-mechanical d-venturi Ans-c
35	____scrubber consumes high energy. a-cyclone b-packed c-mechanical d-venturi Ans-c
36	____scrubber uses fiber glass or other packaging material. a-cyclone b-packed c-mechanical d-venturi Ans-b
37	In which scrubber separating mechanism is primary impingement of the dispersolid on the packaging itself with the liquid medium . a-cyclone

	b-packed c-mechanical d-venturi Ans-b
38	____is a modification of dry liquid by the addition of a liquid phase. a-cyclone b-packed c-mechanical d-venturi Ans-a
39	In which scrubber gas is tangentially enter around the dry cyclone. a-cyclone b-packed c-mechanical d-venturi Ans-a
40	____is used as coolers and as primary cleaners in treating blast furnace gas and for fly ash removal. a-spray tower b-cyclone scrubber c-mechanical scrubber d-venturi scrubber Ans-a
41	In fabric filter, a bag house filter consists of numerous vertical

	bags of dia a-100 to 200 mm b-100 to 300 mm c-120 to 400 mm d-120 to 500 mm Ans-c
42	In which separator carrier gas leaving the particulate matter as a cake on the inside of the bags? a-electrostatic precipitators b-fabric filter c-settling chamber d-none of the above Ans-b
43	Which separator utilizes electrical energy directly for removal of the particulate matter? a-electrostatic precipitators b-fabric filter c-settling chamber d-none of the above Ans-a
44	____used for air cleaning in public building, theaters, railway cars etc. a-electrostatic precipitators b-fabric filter c-settling chamber d-none of the above

	Ans-a
45	Electrostatic precipitator gives how much efficiency? a) 95% b) 80% c) 99% d) 100% Ans-c
46	What are the objectives of using control equipment? a-recovery of valuable waste products b-minimization of plant maintenance c-elimination of health hazard d-all of the above Ans-d
47	_____Fluid is used in wet scrubbers. a- Lime b- $MgSO_4$ c- NaCl d- $K_2Cr_2O_7$ Ans-a
48	___m/s gas velocity is required for good result in settling chamber. a-<0.5 m/s b->0.5 m/s c-<0.1 m/s d->0.1 m/s Ans-a

49	____is a structure without moving parts in which the velocity of an inlet gas stream as a transformed into a confined vortex from which centrifugal forces tend to drive the suspended particles to the wall. a) Inertial separators b) Filters c) Settling chamber d) Cyclone separators Ans-d
50	Which of the following Formula used for find out height of stack? a) Plume height / Actual height of the stack b) Plume height * Actual height of the stack c) Plume height − Actual height of the stack d) Plume height + Actual height of the stack Ans-d

Chapter-5	
1	Which alkali scrubbing is expensive? a-single alkali scrubbing b-double alkali scrubbing c-dry scrubbing d-none of the above Ans-a
2	The main competition in the field of alkali absorption is between____and ____

	a-sodium, potassium b-iron, magnesium c-ammonia, potassium d-sodium, ammonia Ans-d
3	Sodium scrubbing with___has advantage over ammonia a-potassium b-sodium hydroxide c-sodium sulfate d-sodium oxide Ans-b
4	Sodium scrubbing with___has advantage over ammonia a-potassium b-sodium sulfate c-sodium sulfite d-sodium oxide Ans-c
5	Combustion control methods used for control of ___ a-SO_x b-NO_x c-both a and b d-none of the above Ans-b
6	Which of the following parameters that affect NO_x formation? a-temperature b-residence time

	c-extent of mixing d-all of the above Ans-d
7	Which of the following parameters that will not affect NO_x formation? a-temperature b-residence time c-extent of mixing d-velocity of different species Ans-d
8	From an experimental viewpoint, which of the following factors that control NO_x formation? a-air-fuel ratio b-combustion air temperature c-extent of combustion zone cooling d-all of the above Ans-d
9	Control of NO_x emission by____methods is a formidable task. a-flue gas recirculation b-flue gas control c-combustion control d-all of the above Ans-b
10	Which of the following methods used for removal of SO_x? a-lime and limestone scrubbing b-dry scrubbing

	c-magnesium oxide scrubbing d-all of the above Ans-d
11	SO_2 concentration in large urban areas typically ranges from ____ppm for a 1 hr averaging time. a-0.01 to 0.1 b-0.05 to 0.1 c-0.01 to 1.0 d-0.01 to 2.0 Ans-a
12	The thermodynamics and kinetics of SO_x formation in homogeneous flame processes were extensively reviewed in which year? a-1975 b-1972 c-1982 d-1985 Ans-b
13	$SO_2 + ½ O_2 =$ _____ a-SO_2 b-SO_3 c-SO_4 d-all of the above Ans-b
14	$S + O_2 =$ ____ a-SO_2

	b-SO_3 c-SO_4 d-all of the above Ans-a
15	In the combustion of fossil fuels the SO_2/SO_3 ratio is typically____ a-40:1 to 80:1 b-60:1 to 80:1 c-40:1 to 60:1 d-80:1 to 100:1 Ans-a
16	Residual fuel oils have a sulfur content from___percent. a-1 to 3 b-1 to 4 c-1 to 6 d-1 to 8 Ans-b
17	Montana power company installed double alkali scrbbing with units of___ a-350 MW b-360 MW c-340 MW d-380 MW Ans-b
18	In double alkali scrubbing sodium oxide solution which combines with____to form primarily sodium sulfite (Na_2SO_3).

	a-sulfur dioxide b-sulfur trioxide c-sodium hydroxide d-sodium sulfate Ans-a
19	In double alkali scrubbing sodium hydroxide solution which combines with____to form primarily sodium sulfite (Na_2SO_3). a-sulfur dioxide b-sulfur trioxide c-sodium oxide d-sodium sulfate Ans-a
20	The final dried product in double alkali scrubbing is suitable for___ a-incineration b-landfill c-digestion d-none of the above Ans-b
21	The spent scrubbing liquor in double alkali scrubbing is removed to a secondary loop where___is added in a reactor. a-lime b-soda c-coal d-sodium Ans-a

22	All magnesium oxide scrubbing process involve scrubbing with ____slurry. a-$Mg(OH)_2$ b- $Mg(OH)_3$ c- $Mg(OH)_4$ d-none of the above Ans-a
23	In magnesium oxide scrubbing, absorption of SO_2 by the slurry leads to the formation of _____ a-magnesium sulfite b-magnesium sulfate c-both a and b d-none of the above Ans-c
24	The lime wet scrubbing process was originally developed in England by_____ a- Imperial Chemical Industries b- Imperial Pharmaceutical Industries c- Imperial Textile Industries d-none of the above Ans-a
25	Imperial Chemical Industries developed lime wet scrubbing process in____ a-1920 b-1930 c-1940

	d-1950 Ans-b
26	How much percent efficiencies attained in pilot plant operation in lime and limestone scrubbing for removal of sulfur dioxide? a-95 b-90 c-99 d-80 Ans-b
27	In single alkali scrubbing, a sodium sulfite solution scrubs the SO_2 from the flue gas and____formed. a-sodium bisulfite b-sodium bisulfate c-sodium sulfate d-sodium dioxide Ans-a
28	In double alkali scrubbing expensive sodium alkali solution is continuously regenerated in the reactor and recycled to the____ a-primary loop absorber b-secondary loop absorber c-tertiary loop absorber d-none of the above Ans-a
29	In which percent range Montana power company measured removal efficiencies for SO_2? a-70 to 75

	b-80 to 85 c-70 to 85 d-75 to 80 Ans-a
30	Other methods used for desulfurizing flue gas involving a-adsorption on charcoal b-scrubbing with sulfuric acid c-organic scrubbing d-all of the above Ans-d
31	In other methods used for desulfurizing flue gas, scrubbing with sulfuric acid followed by____? a-crystallization with limestone b- crystallization with lime c-only crystallization d- crystallization with activated carbon Ans-a
32	In wet scrubbing SO_2 is removed by coming into contact with which absorbing solution? a-sodium carbonate b-sodium sulfonate c-sodium bicarbonate d-sodium sulfite Ans-a
33	In wet scrubbing SO_2 is removed by coming into contact with which absorbing solution?

	a-slaked lime b-sodium sulfonate c-sodium bicarbonate d-sodium sulfite Ans-a
34	In dry scrubbing the temperature of the gas leaving the spray dryer is around____ a-60 °F b-50 °F c-40 °F d-30 °F Ans-b
35	In dry scrubbing the temperature of the gas leaving the spray dryer is around____ a-60 °C b-50 °C c-40 °C d-30 °C Ans-d
36	In which method a portion of the cooled flue gas is injected back into the combustion zone? a-flue gas recirculation b-flue gas generation c-two stage combustion d-none of the above Ans-a

37	It would be anticipated that the higher the rate of heat release per effective surface area of the combustion chamber , the higher the temperature of the flame zone and thus the _____ a-lower the NO_x emission b-higher the NO_x emission c-moderate NO_x emission d-all of the above Ans-b
38	Which of the following factors plays important role in control of NO_x ? a-furnace burner configuration b-combustion air temperature c-compbustion zone cooling d-all of the above Ans-d
39	In wet limestone scrubbing with modified magnesium sulfate, consumption of power is decreased by_____ a-60 percent b-50 percent c-70 percent d-80 percent Ans-b
40	In wet limestone scrubbing with modified magnesium sulfate, scrubber can also be used to remove high percentage___. a-coarse particulate b-medium particulate

	c-fine particulate d-all of the above Ans-c
41	In wet limestone scrubbing with modified magnesium sulfate, sulfur dioxide and water form____. a-H_2 SO_4 b- H_2SO_3 c- HSO_3 d- HSO_4 Ans-b
42	In wet limestone scrubbing with modified magnesium sulfate, in the presence of____$MgSO_3$ regenerated. a-calcium carbonate b-calcium bicarbonate c-calcium oxide d-none of the above Ans-a
43	What is the chemical formula of Gypsum? a-CaSO4 2H2O b-CaSO4 H2O c-CaSO4 3H2O d-CaSO4 4H2O Ans-a
44	In single alkali scrubbing, for lower sulfur coal a____SO2 concentration in the exit stack stream is expected. a-300 ppm

	b-200 ppm c-500 ppm d-600 ppm Ans-b
45	Presence of excess air affects both____in the post combustion zone. a-velocity and temperature of gases b-temperature and oxygen concentration of gases c-humidity and oxygen concentration of gases d-all of the above Ans-b
46	In wet limestone scrubbing with modified magnesium sulfate, Use of magnesium sulfate in the scrubber liquid leads to____SO2 absorbing capacity a-increased b-decreased c-neutral d-none of the above Ans-a
47	In wet limestone scrubbing with modified magnesium sulfate, Use of magnesium sulfate in the scrubber liquid leads to increased SO2 absorbing capacity and _____ a-elimination of scaling in the scrubber b-elimination of fine particulate c-both a and b d-none of the above

	Ans-c
48	$CaO + H_2O =$_____ a-$Ca(OH)_3$ b- $Ca(OH)_2$ c- $Ca(OH)_4$ d- CaOH Ans-b
49	In magnesium oxide scrubbing, absorption of SO_2 by the slurry leads to the formation of ____ a-magnesium sulfate b-magnesium sulfite c-magnesium dioxide d-both a and b Ans-d
50	In magnesium oxide scrubbing,_____added in the calcining step reduces any sulfate present. a-coke b-other reducing agent c-both a and b d-none of the above Ans-c