DON BOSCO INSTITUTE OF TECHNOLOGY
Mysore Road, Bangalore – 560 074

ENVIRONMENTAL STUDIES
STUDY MATERIAL

AS PER VTU SYLLABUS COMMON TO ALL BRANCHES

SEMESTER: V
SUB CODE: 18CIV59

B.E IN CIVIL ENGINEERING(CV-2018-19)
Outcome Based Education (OBE) and Choice Based Credit System
(CBCS) SEMESTER – V

ENVIRONMENTAL STUDIES

Course Code	**18CIV59**	CIE Marks	40
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60
Credits	01	Exam Hours	02

Module - 1

Ecosystems (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake.
Biodiversity: Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.

Module - 2

Advances in Energy Systems (Merits, Demerits, Global Status and Applications)**:** Hydrogen, Solar, OTEC, Tidal and Wind.
Natural Resource Management (Concept and case-studies): Disaster Management, Sustainable Mining, Cloud
Seeding, and Carbon Trading.

Module - 3

Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies)**:** Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. **Waste Management & Public Health Aspects:** Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes;
Industrial and Municipal Sludge.

Module - 4

Global Environmental Concerns (Concept, policies and case-studies): Ground water depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology.

Module - 5

Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications): G.I.S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs.
Field work: Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief documentation.

Course outcomes: At the end of the course, students will be able to:

- CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
- CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
- CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
- CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

Question paper pattern:

- The Question paper will have 100 objective questions.
- Each question will be for 01 marks
- Student will have to answer all the questions in an OMR Sheet.
- The Duration of Exam will be 2 hours.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Environmental Studies	Benny Joseph	Tata Mc Graw – Hill.	2nd Edition, 2012
2.	Environmental Studies	S M Prakash	Pristine Publishing House, Mangalore	3rd Edition, 2018
3	Environmental Studies – From Crisis to Cure	R Rajagopalan	Oxford Publisher	2005
Reference Books				
1	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning, Singapur.	2nd Edition, 2005
2	Environmental Science – working with the Earth	G.Tyler Miller Jr.	Thomson Brooks /Cole,	11th Edition, 2006
3	Text Book of Environmental and Ecology	Pratiba Sing, AnoopSingh& PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1st Edition

MODULE I
ECO SYSTEM AND BIODIVERSITY

1. In which of the following place we can find the cold deserts?
a) Bangalore
b) Chennai
c) Himalaya
d) Rajasthan

Answer: c
Explanation: Cold deserts are the deserts where we can find less vegetation and few organisms which is adopted to live in cold regions. Cold deserts covered with snow. We can also find this cold deserts in the high plateaus of the Himalayas.
2. What kind of climate we can find in the Thar Desert?
a) Cold
b) Dry
c) Cool
d) Moist

Answer: b
Explanation: The climate in the Thar Desert is extremely dry. Most of the typical desert landscape seen in Rajasthan is in the Thar Desert. Thar Desert has sand dunes and it also has areas covered with spares grasses with few shrubs.
3. Where can we find babul tree?
a) In deserts ecosystems
b) In river deltas
c) In grassland ecosystems

d) In semi-arid ecosystems

Answer: d
Explanation: Semi-Arid ecosystem or also known as desert vegetation. The areas in the adjoining semi-arid tract, the vegetation consists of a few shrubs and thorny trees. Babul is one of the thorny trees found along with the kher tree.
4. Why Rann of Kutch attracts aquatic birds in monsoon season?
a) Because desert land is converted to forest land
b) Because desert land is converted to snow
c) Because desert land do not convert
d) Because desert land is converted to salt marshes

Answer: d
Explanation: Rann of Kutch is extraordinarily specialized air ecosystems. In summer the land is similar to a desert landscape. These are low-lying areas near the sea; they are converted to salt marshes during the monsoon.
5. Desert and semi-arid regions have many organisms such as insects, birds and animals.
a) True
b) False

Answer: a
Explanation: Desert and semi-arid regions have a number of specialized insects and reptiles. The rare animals such as Indian Wolf, desert cat, desert fox and birds such as the great Indian bustard and florican also present in desert ecosystem.
6. What makes desert region to become highly unproductive?
a) Salinity
b) Sunlight
c) Temperature
d) Increase in the rain

Answer: a
Explanation: The conversion of desert lands through extensive irrigation systems has changed several of the natural characteristics. Canal water evaporates rapidly bringing the salts to the surface. The region becomes highly unproductive as it becomes saline.
7. How can desert ecosystems be conserved?
a) By minimizing the human activity
b) By pouring water to desert area
c) By deforestation
d) By killing organisms

Answer: a
Explanation: Desert ecosystems can be conserved if we minimize the human activities in forest land and other cultivable land. Humans convert forest land in order to convert it to farming or for industrial usage.
8. Which of the following tribe protected trees from several generations in Rajasthan?
a) Bishnoi
b) Papadi
c) Korvanji
d) Gudus

Answer: a
Explanation: The Bishnoi tribe in Rajasthan is known to have protected their khejdi trees for several generations. The tradition began when the ruler of their region ordered his army to cut down trees for his own use.
9. Where can we see Indira Gandhi Canal?
a) Gujarat
b) Rajasthan
c) Punjab
d) Haryana

Answer: b
Explanation: The Indira Gandhi Canal is situated in Rajasthan. There is destroying in its important natural arid ecosystem as it will convert the region into an intensive agricultural land. Salt works also destroyed the area.
10. Which kind of soil we can found on the surface of Thar desert?
a) Rocky
b) Moist
c) Fertile
d) Aeolian

Answer: d
Explanation: The surface of the Thar desert consists of Aeolian sand. This Aeolian sand consists of wind deposited sand that has accumulated over the past 1.8 million years. The soil of the Thar desert remains dry throughout year.
11. Which is the biggest desert in the world including both hot and cold deserts?
a) Sahara
b) Arctic
c) Arabian
d) Antarctica

Answer: d
Explanation: Antarctica is the biggest desert in the world. Sahara is the biggest only in hot deserts but overall Antarctica comes to first place. The entirety of Antarctica is a desert with an annual precipitation of less than 200mm.
12. Deserts can only be 'HOT'.
a) True
b) False

Answer: b
Explanation: Deserts are classified into hot desserts and cold deserts. Sahara is the biggest hot desert in the world with an area of 9,000,000(Miles squared), whereas Antarctica is the biggest cold desert as well as overall biggest desert.
13. How many parts are there in the forest ecosystem?
a) One
b) Two
c) Three
d) Four

Answer: b
Explanation: A forest ecosystem has two parts they are, abiotic and biotic. Abiotic type of forest depends on abiotic conditions at the site, they are also called non-living aspects of the forest. Biotic type of forest depends on plants and animals form communities that are specific to each forest type.
14. On which factor forest type is mainly dependent?
a) Abiotic
b) Size of the forest
c) Shape of trees
d) Products from the trees

Answer: a
Explanation: The forest type mainly depends on abiotic factors such as the climate and soil characteristics of a region. It also depends on the nature of the tree species whether they are evergreen forest, deciduous, xerophytes or mangroves
15. Where can we find coniferous forest in India?
a) Deserts
b) River deltas
c) Grassland
d) Himalayan

Answer: d

Explanation: Coniferous forests grow in the Himalayan mountain region. It requires low temperature. Forests dominated by conifers such as pine, hemlock, spruce and fir. Wildlife such as snow leopards, Himalayan tahrs and musk deer's are found in this region.

16. Why most of the Sun light does not penetrate to the ground in evergreen forest?
a) Because of snowfall
b) Because of less temperature
c) Because of trees overlap with each other
d) Because of less rainfall

Answer: c
Explanation: Evergreen forests look green throughout the year due to high rainfall. The trees overlap with each other to form a continuous canopy. Thus, little light penetrates down to the forest floor. The forest is rich in orchids and ferns.

17. Which state in India has the maximum percentage of its area covered by forests?
a) Arunachal Pradesh
b) Madhya Pradesh
c) Mizoram
d) Nagaland

Answer: b
Explanation: Mizoram has the highest percentage is covered by forests. The state is host to numerous species of birds, wildlife. This is followed by Lakshadweep. Mizoram covers about 88% of its land with forest.

18. Forest plays an important role in ecosystem.
a) True
b) False

Answer: a
Explanation: Forests hold importance for all inhabitants as well as for the overall health of planet. Forest protects from adverse climatic conditions. Forests are major contributors to the Earth's ability to maintain its climate. Deforestation negates these benefits.

19. Where can we find thorn forest in India?
a) Semi-arid regions
b) Desert regions
c) Himalayan regions
d) Northeast regions

Answer: a

Explanation: Thorn forests are found in the semi-arid regions of India. The trees, which are sparsely distributed, are surrounded by open grassy area. Thorn forest trees have long or fibrous roots to enable them to reach water at great depths.

20. What is considered as lungs of nature?
a) Rock
b) Sun
c) Water
d) Trees

Answer: d
Explanation: Tress is considered as lungs of nature. Trees control pollutions by absorption and carbon dioxide and they release oxygen in return. This is similar to the respiration mechanism of lungs in humans where it takes oxygen by eliminating carbon dioxide.
21. How erosion controlled by forest?
a) By reducing in the sunlight penetration
b) By reducing the rainfall's force on the soil's surface
c) By reducing the pressure
d) By increasing the rainfall's force on the soil's surface

Answer: b
Explanation: Forest prevents erosion by reducing the rainfall's force on the soil's surface. Forest absorbing water and they do not allow it to flow directly run off. By this method, they prevent the removal of topsoil.
22. How forests increase the atmosphere's humidity?
a) By transpiration
b) By inspiration
c) By expiration
d) By oxidation

Answer: a
Explanation: Forest release water vapor by transpiration which increases humidity. Forest contains many trees, these trees undergo photosynthesis. During this process, they released oxygen and water resulting in increase in humidity of atmosphere.
23. Which of the following type of forest important for watersheds?
a) Tropical Evergreen forest
b) Tropical Deciduous forest
c) Tropical Montana forests
d) Grassland forest

Answer: c
Explanation: Tropical Montana forests play an important role in watersheds. Watersheds are defined as an area of land that contains a common set of streams and rivers that all join into a single larger body of water. Tropical Montana forest is characterized by dense forest which helps in watershed.
24. How the tropical rain forest gets the name?
a) Due to less rain
b) Due to heavy rain
c) Due to moderate rain
d) Due to no rain required

Answer: b
Explanation: The tropical rain forest named so because they receive a lot of rain. They receive an average of 80 inches a year. Due to heavy rain temperature doesn't change very much and it is always warm and muggy.
25. Where can we find the most feared spider in the world 'Tarantulas'?
a) In deserts
b) In mountains
c) In tropical rain forests
d) In grassland forest

Answer: c
Explanation: 'Tarantulas' is one of the deadliest spiders found in tropical rain forest. Most species of tarantula have poisonous fangs for killing prey and to protect itself from other organisms. The tropical rain forest suits for this spider to survive.
26. The biomass of a forest is defined as the mass of living plants.
a) True
b) False

Answer: a
Explanation: The biomass of a forest is defined as the mass of living plants. It is normally expressed as dry weight per unit area. Biomass production in the forest is the rate at which biomass is accrued per unit area over a fixed interval of time in a forest.
27. How many types of aquatic ecosystems are there?
a) One
b) Two
c) Three
d) Four

Answer: b
Explanation: There are two important aquatic ecosystems are there. One is fresh water ecosystem and one more is marine ecosystem. Again these two ecosystems are further divided into various categories. Marine includes sea whereas fresh water includes lakes, rivers and wetlands.
28. Where plants and animals live in aquatic ecosystems?
a) Water
b) Land
c) Air
d) Fire

Answer: a
Explanation: In aquatic ecosystems, plants and animals live in water. These species which are live in water adapted themselves for a different type of aquatic habitats. From breeding to all mechanisms take place inside the water only.
29. What made organisms to build their ecosystem in aquatic?
a) Curiosity
b) Evolution
c) Force from other organisms
d) Increase in water level

Answer: b
Explanation: According to scientists Earth's first cellular life arose primordial in oceans. Later as evolution takes place many animals from aquatic ecosystem came to land and adopt themselves to live in the condition of land.
30. Where can we find both running water as well as stagnant water?
a) Marine ecosystems
b) Wetlands
c) Coral reefs
d) Freshwater ecosystems

Answer: d
Explanation: The freshwater ecosystems that have running water as streams and rivers. Ponds, tanks and lakes are ecosystems where water doesn't flow. So in freshwater we can find both running water as well as stagnant water.
31. In which of the following we can see fluctuation in the water level dramatically in different season?
a) Coral reefs
b) Brackish water
c) Wetlands
d) Deep oceans

Answer: c
Explanation: Wetlands are special ecosystems in which the water level fluctuates dramatically in different seasons. They have expanses of shallow water with aquatic vegetation form an ideal habitat for fish and water birds.
32. Which is the largest ecosystem on Earth?
a) Desert
b) Forest
c) Grassland
d) Oceans

Answer: d
Explanation: Ocean is the largest ecosystem on Earth. When we see the Earth from space we can only see blue color. That is due to water, seventy percent of Earth's surface is covered by water, Water is vital for the survival of all living things.
33. Where can we see coral reefs?
a) In pond
b) In desert
c) In shallow tropical seas
d) In dense tropical forest

Answer: c
Explanation: Coral reefs come under Marine ecosystems. Marine ecosystems are highly saline water. Coral reefs are very rich in species and are found only in shallow tropical seas. The coral reefs in India are around the Andaman and Nicobar islands and found in the Gulf of Kutch.
34. Which of the following is among the world's most productive ecosystems in terms of biomass production?
a) Pond ecosystems
b) Lake ecosystems
c) Brackish water ecosystems
d) River ecosystems

Answer: c
Explanation: Brackish water ecosystems in river deltas are covered by mangrove forests and are among the world's most productive ecosystems in biomass production. Sunder bans in a delta of Ganges river is one of the example.
35. Which is the simplest aquatic ecosystem?
a) Pond
b) Stream
c) Lake

d) Marine

Answer: a
Explanation: Pond is the simplest aquatic ecosystems. Most ponds become dry after the rain over and are covered by terrestrial plants for the rest of the year. When the ponds fills in the monsoon season, a large number of food chains formed in the pond ecosystems.
36. Which ecosystem is known as giant permanent pond?
a) Lake Ecosystem
b) Pond ecosystem
c) Seashore ecosystem
d) Marine ecosystem

Answer: a
Explanation: A lake ecosystem functions like a giant permanent pond. A large amount of its plant material is algae. Algae derives its energy directly from sun, this energy is transferred to microscopic animals which feeds on algae
37. How many oceans constitute the marine ecosystems around peninsular India?
a) One
b) Two
c) Three
d) Four

Answer: c
Explanation: The Indian Ocean, Arabian Sea and Bay of Bengal constitute the marine ecosystems around peninsular India. In the coastal areas, the sea is shallow while further away it is deep. Peninsular shape helps India to protect from neighboring countries.
38. Beach is classified into which ecosystem?
a) Lake Ecosystem
b) Seashore ecosystem
c) Pond ecosystem
d) River ecosystem

Answer: b
Explanation: Beaches can be sandy, rocky, shell covered. On each of these different types several species have evolved to occupy a separate them. There is a presence of crustaceans as crabs that make holes in the sand.
39. Biodiversity can be broadly classified into how many types?
a) 2
b) 5
c) 3

d) 4

Answer: c
Explanation: The three types are species diversity (number of the different species found in location), Genetic diversity (genetic variations within a species) and Ecological diversity (variations in the ecosystems of regions).
40. Biodiversity is of importance as it offers:
a) Stability of ecosystems
b) Stability of atmosphere
c) Stability of species
d) Stability of research

Answer: a
Explanation: Biodiversity helps in maintaining ecological stability. The ecosystems have an ability to maintain its original nature even after disturbances occur within it, with the help of biodiversity.
41. The loss in biodiversity is not attributed to:
a) Explosion in the human population
b) Transforming earth's surface
c) Destruction of natural habitats
d) Use of sustainable products

Answer: d
Explanation: The ever-exploding increase in human population leads to the consumption of resources and exploitation of the earth's surface. This results in the destruction of natural habitats and ecosystems. The use of sustainable alternatives is a step towards conservation.

42. Biodiversity has an aesthetic value to it.
a) True
b) False

Answer: a
Explanation: The natural beauty of the earth has refreshing sights, taste and odors. These add an aesthetic value; wide varieties of colors and fragrance of flowers, taste and colors of fruits, etc.

43. In how many ways does the conservation of biodiversity work?
a) 5
b) 2
c) 3

d) 4

Answer: b
Explanation: The conservation methods are broadly classified as in-situ conservation (the species are conserved in their natural ecosystems, which are protected) and ex-situ conservation (breeding of new and endangered plants/animals in controlled conditions).
44. Which one of the following is not an in-situ conservation method?
a) Zoo
b) National Parks
c) Biosphere Reserves
d) Sanctuaries

Answer: a
Explanation: Zoo is a controlled environment where animals are kept. The other 3 options are the natural habitat or areas where the species reside.
45. Which is an advantage of ex-situ conservation?
a) Cheap method
b) Conserve large number of species together
c) Genetic process for breeding/long life
d) Existence in natural habitat

Answer: c
Explanation: Endangered plants/animals can be provided the conditions required for larger life with captive breeding and genetic techniques for development of the species which are healthy and more productive.
46. The activities of cultivation of land, timber harvesting is permitted in:
a) Sanctuaries
b) National Parks
c) Biosphere Reserves
d) Protected Areas

Answer: a
Explanation: Sanctuaries are the areas where only wildlife is present. So, cultivation, harvesting of timber, etc is permitted only if does not interfere with the project. In all the other 3 options, it is prohibited.
47. Hot spot areas have:
a) Low density of biodiversity
b) Only endangered plants
c) High density of hot springs
d) High density of biodiversity

Answer: d
Explanation: There are areas with a high density of biodiversity, which are presently the most endangered. There are 16 hot spots in the world and 2 in India: North East Himalayas with 3500 endemic species and the Western Ghats with 1600.
48. What is the cause of discoloration in fresh water?
a) Fungal bloom
b) Viral bloom
c) An algae bloom
d) Bacterial bloom

Answer: c
Explanation: Algae blooms are the most common problems encountered by fresh water bodies like lake and pond. Certain forms of algae may harbor toxins. By mechanical and physical intervention we can keep the fresh water clean and clear.
49. The Great Smog in 1952 caused in which city?
a) Delhi
b) Lahore
c) London
d) New York

Answer: c
Explanation: In 1952 severe air pollution caused in London. It combined with an anticyclone cold weather, windless conditions and collected air borne pollutants which are raised from the use of coal. This is one of the clear example of deforestation and lack of fresh air.
50. In which forest we can see deforestation to large extent?
a) Atlantic forest
b) Amazon forest
c) Borneo forest
d) Sumatra forest

Answer: b
Explanation: According to World Wildlife report Amazon forest is the region where we can see more number of deforestation than any other region. Amazon forest which is the world's largest forest is also the site of the biggest projected loss due to deforestation.
51. Due to deforestation the pure air that we intake became less in its availability.
a) True
b) False

Answer: a

Explanation: The air humans and other animals consume is oxygen. Trees release oxygen when they use energy from sunlight to male glucose from carbon dioxide and water. But due to deforestation there is a lack of trees which thereby reduced the air production and this also cause increase in carbon dioxide level.

52. The biggest driver of deforestation is_____
a) Agriculture
b) Forest fire
c) Volcanic activities
d) Soil erosion

Answer: a
Explanation: The biggest driver of deforestation is Agriculture. This is due to, farmers cut forests to provide more space for planting crops. The other reason is grazing livestock. The process of burning of trees by cutting them is known as slash agriculture.

53. The best way to reduce deforestation is by_____
a) Using more paper
b) Clear more area of trees to grow plant
c) Burning forest in order to create cultivated land
d) Clear more area of plants to grow trees

Answer: d
Explanation: In order to reduce deforestation we need to make sure it is possible only by growing more number of trees. The large trees will make dense forest and by this only we can able to avoid deforestation. All the other options create deforestation.

54. Due to deforestation how much fields worth of trees is lost per minute?
a) 12 football
b) 24 football
c) 36 football
d) 48 football

Answer: c
Explanation: According to World Wildlife Fund about 36 football fields' worth of trees lost every minute. It's due to various reasons like agriculture, for logging, for bio fuels, for the construction of roads, mining etc.

55. Rain forest land is most often cleared for_____
a) Pasture
b) Forest fire
c) Human activities
d) High pressure

Answer: c
Explanation: In rain forest land is majorly losing its land due to human activities. Large areas of rain forest are being cut down often in order to remove just a few logs. Rain forest is being destroyed at double the rate than ever. There is a very high rate of extinction.
56. The main cause of wildfire is_____
a) Volcanic activity
b) Lightening
c) Pollution
d) Human activity

Answer: d
Explanation: Human beings are the number one cause of wildfires. Many of these wildfires are caused by cigarette butts being left on the land. Some of the man made causes of wildfires are, burning debris, arson, equipment failure, unattended campfires.
57. Which nation is most affected by deforestation?
a) Honduras
b) Indonesia
c) Benin
d) Ghana

Answer: a
Explanation: Honduras is the nation which is most affected by deforestation. In Honduras, 37% of forest land is lost due to deforestation. Whereas Indonesia, Benin and Ghana saw a decline of 26%, 31%, 28% respectively.
58. Deforestation is a good process.
a) True
b) False

Answer: b
Explanation: No, deforestation is not a good process. Deforestation clears the forest area which directly affects animals and environment. Though there are some advantages of deforestation like agricultural practices and create an opportunity to graze animals. But instead of this, we can use alternative methods in order to save forest.
59. Which type of farming cause more amount of deforestation?
a) Subsistence farming
b) Commercial farming
c) Mixed farming
d) Dairy farming

Answer: a
Explanation: According to the United Nations Framework Convention on climate change, the direct cause of deforestation is agriculture. In agriculture, Subsistence farming is responsible for 48% of deforestation and commercial farming is responsible for 32%

MODULE 2
ADVANCES IN ENERGY SYSTEM AND NATURAL RESOURCE MANAGEMENT

60. Which of the following supplies maximum amount of hydrogen gas?
a) Natural gas
b) Anaerobic Digestion
c) Wastewater treatment
d) Electrolysis

Answer: a
Explanation: All the four options produce hydrogen gas. However, fossil fuels, specifically natural gas is the major producer of hydrogen gas. Biomass and biogas are the also commonly used to produce hydrogen gas.
61. In terms of green house gas emissions, how good or bad is hydrogen fuel?
a) Major contributor of greenhouse gas emissions
b) Zero-emission fuel
c) Lowest contributor of greenhouse gas emissions
d) Hydrogen cannot be used as fuel

Answer: b
Explanation: Hydrogen fuel is a clean source of energy. It is a zero-emission fuel burned with oxygen and is used in different applications to generate electricity. Among all sources of energy, burning fossil fuels produces maximum amount of greenhouse gases.
62. Which of the following use hydrogen as fuel?
a) Fossil fuels
b) Anaerobic digestion
c) Fuel cells
d) Cooking

Answer: c
Explanation: Fuel cells and internal combustion engines used hydrogen as fuel cells. Anaerobic digestion requires biomass in the form of waste water to generate electricity. Though fossil fuels

contain hydrogen atoms, they do not require external supply of hydrogen as fuels. Cooking does not require hydrogen as fuel.

63. Which of the following is the most popular application of hydrogen fuel cell?
a) Fuel cell vehicles
b) Fuel cell energy power plants
c) Fuel cells stand-alone power supplies
d) Fuel cells spacecraft

Answer: d
Explanation: Spacecraft propulsion uses hydrogen as fuel with the help of fuel cells. It is one of the most established techniques to deploy spacecrafts into outer-space. Though fuel cell vehicles are becoming popular, they are not well established yet.

64. How is hydrogen gas produced from fossil fuels?
a) Partial oxidation of methane
b) Electrolysis
c) Evaporation
d) Biomass gasification

Answer: a
Explanation: Hydrogen gas is produced from fossil fuels by different techniques like partial oxidation of methane, steam reforming and coal gasification. Biomass gasification and electrolysis produce hydrogen gas in small quantities.

65. What is the major drawback of steam-methane reforming technique to produce hydrogen?
a) Capital intensive
b) Releases greenhouse gases into atmosphere
c) A niche technology
d) Poor efficiency

Answer: b
Explanation: The steam-methane reforming technique is the current leading technology to produce hydrogen. However, the main drawback of steam-methane reforming technique is that it releases greenhouse gases, carbon dioxide and carbon monoxide into the atmosphere.

66. How does electrolysis produce hydrogen?
a) By running electricity to combine hydrogen and water
b) By separating water into hydrogen and oxygen and generating electricity
c) By passing electricity into water to separate it into hydrogen and oxygen
d) By passing electricity into water to evaporate it into hydrogen

Answer: c

Explanation: Electrolysis is one of the cleanest techniques to produce hydrogen. Electricity is passed through water to separate it into oxygen and hydrogen. In electrolysis, electricity is not generated and instead is used to perform a chemical reaction

67. Why is hydrogen hazardous as fuel?
a) Because of high ignition and low combustion energy
b) Because of high ignition and high combustion energy
c) Because low ignition and low combustion energy
d) Because of low ignition and high combustion energy

Answer: d
Explanation: Hydrogen is extremely dangerous as fuel. This is because hydrogen has a low ignition temperature and releases large amounts of energy during burning – high combustion energy. Also, it is hard to store as it tends leak easily from storage tanks.

68. Traditionally, why is steam methane reforming preferred over electrolysis?
a) Because electrolysis requires electricity
b) Because electrolysis has lower production efficiency
c) Because steam methane reforming produces greenhouse gases
d) Because electrolysis produces greenhouse gases

Answer: a
Explanation: Traditionally, steam methane reforming preferred over electrolysis. This is simply because electrolysis requires electricity. Currently, producing electricity is expensive. As the cost of producing a unit of electricity becomes cheaper, electrolysis will be favored over steam methane reforming because it does not release greenhouse gases.

69. What is the main problem in using hydrogen as fuel for vehicles?
a) Capital intensive
b) Storage
c) Fuel cell technology is not well established
d) Cars will become heavy

Answer: b
Explanation: The main problem in using hydrogen as fuel for vehicles is storage of hydrogen. Hydrogen is difficult to store because it leaks easily. Moreover, it is extremely hazardous as fuel due to its low ignition temperature and high combustion energy.

70. What is a fuel cell?
a) Converts heat energy to chemical energy
b) Converts heat energy to electrical energy
c) Converts chemical energy to electrical energy
d) Converts kinetic energy to heat energy

Answer: c
Explanation: A fuel cell works just like a battery. It converts chemical energy to electrical energy. The chemical energy from a redox reaction occurring within the cell is converted to electrical energy due to the flow of electrons.
71. How does hydrogen fuel cell work?
a) Membrane → hydrogen ions → electric current and recombination with oxygen
b) Electric current and recombination with oxygen → hydrogen ions → membrane
c) Hydrogen ions → membrane → electric current and recombination with oxygen
d) Recombination with oxygen → electric current → membrane → hydrogen ions

Answer: d
Explanation: The hydrogen ions in one chamber of the cell flow into the other chamber through a membrane to recombine with oxygen. Since this is a redox reaction, electric current is generated due to flow of electrons.
72. What does hydrogen fuel cell emit?
a) Water
b) Steam
c) Greenhouse gas
d) Methane

Answer: a
Explanation: Hydrogen fuel cell produces water – its only emission. It does not release any greenhouse gases or carbon compounds like methane because the reaction occurs with two substances, hydrogen and oxygen.
73. Fuel cell vehicle is sourced by a battery.
a) True
b) False

Answer: b
Explanation: A fuel cell vehicle (FEV) or a fuel cell electric vehicle (FCEV) is sourced by a fuel cell. It may work in combination with a battery to supply sufficient power to run the systems. But the source of the energy is a fuel cell.
74. High pressure containers are used to store hydrogen.
a) True
b) False

Answer: a
Explanation: Hydrogen is stored in a variety of ways to prevent hazards. One of them is by using high pressure containers. Another commonly used technique is cryogenics – low temperatures

75. Which of the following energy has the greatest potential among all the sources of renewable energy?
a) Solar energy
b) Wind Energy
c) Thermal energy
d) Hydro-electrical energy

Answer: a
Explanation: Solar energy has the greatest potential of all the sources of renewable energy which comes to the earth from sun. This energy keeps the temperature of the earth above that in colder space, causes wind currents in the ocean and the atmosphere, causes water cycle and generates photosynthesis in plants.
76. What is the rate of solar energy reaching the earth surface?
a) 1016W
b) 865W
c) 2854W
d) 1912W

Answer: a
Explanation: The solar energy reaching the surface of the earth is about 1016W whereas the worldwide power demand is 1013W. That means solar energy gives us 1000 times more energy than our requirement.
77. What is total amount of solar energy received by earth and atmosphere?
a) 3.8 X 1024 J/year
b) 9.2 X 1024 J/year
c) 5.4 X 1024 J/year
d) 2.1 X 1024 J/year

Answer: a
Explanation: Even if we use 5% of this energy, it is more than 50 times our requirement. The total solar radiation absorbed by the earth and its atmosphere is 3.8 X 1024 Joules/year. Except that it is distributed over the area of earth.

78. Which is most common source of energy from which electricity is produced?
a) Hydroelectricity
b) Wind energy
c) Coal
d) Solar energy

Answer: c

Explanation: Coal is the most common source of energy that is being used since industrialization. Modern steam boilers can burn coal in any of its form as a primary fuel. Different ranks of coal available are peat, lignite, bituminous and anthracite.

79. Oil is estimated to last for _____ more.

a) 100 years

b) 500 years

c) A decade

d) 800 years

Answer: a

Explanation: Almost 40% of energy needs is met by oil alone. With present consumption and a resource of 250,000 million tons of oil, it is estimated to be last for only 100 years, unless more oil is discovered. Major chunk of oil comes from petroleum.

80. Complete the following reaction.

$H_2O + CO_2 \rightarrow$ _____

a) $CH_2O + O_2$

b) $CO_2 + O_2$

c) $H + CO_2 + O_2$

d) $CH_2O + H_2O + O_2$

Answer: a

Explanation: $H_2O + CO_2 \rightarrow CH_2O + O_2$ ∵under solar energy CH_2O is stable at low temperature but breaks at higher temperature releasing heat equal to 469 Kj/mole.

81. In what form is solar energy is radiated from the sun?

a) Ultraviolet Radiation

b) Infrared radiation

c) Electromagnetic waves

d) Transverse waves

Answer: c

Explanation: Solar energy is radiated from the sun in the form of electromagnetic waves of shorter wavelength of 0.2 to 0.4 micrometers. Out of all the solar energy radiations reaching the earth's atmosphere, 8% is ultraviolet radiation, 40% is visible range light and 46% is by infrared radiation.

82. What does MHD stands for in the energy field?

a) Magneto Hydro Dynamic

b) Metal Hydrogen Detox

c) Micro Hybrid Drive

d) Metering Head Differential

Answer: a
Explanation: Magneto hydro dynamic is a generator which is used for direct conversion of thermal energy into electrical energy. They work on faraday principle. When an electric conductor moves across a magnetic field, electric current is produced.
83. Solar radiation which reaches the surface without scattering or absorbed is called _____
a) Beam Radiation
b) Infrared radiation
c) Ultraviolet radiation
d) Diffuse radiation

Answer: a
Explanation: Solar radiation that has not been absorbed or scattered and reaches the ground from the sun is called direct radiation or beam radiation. It is the radiation which produces a shadow when interrupted by an opaque object.
84. The scattered solar radiation is called _____
a) Direct Radiation
b) Beam Radiation
c) Diffuse radiation
d) Infrared Radiation

Answer: c
Explanation: Diffuse radiation received from the sun after its direction has been changed by reflection and scattering by the atmosphere. Since the solar radiation is scattered in all direction in the atmosphere, diffuse radiation comes to the earth from all parts of the sky.
85. Solar radiation received at any point of earth is called _____
a) Insolation
b) Beam Radiation
c) Diffuse Radiation
d) Infrared rays

Answer: a
Explanation: Insolation is the total solar radiation received at any point on any point on the earth's surface. In other words insolation is the sum of the direct and diffuse radiation. More specifically insolation is defined as the total solar radiation energy received on a horizontal surface of unit area on the ground in unit time.
86. Insolation is less _____
a) When the sun is low
b) When the sun right above head
c) At night

d) At sun rise

Answer: a
Explanation: The insolation at a given point or location on the earth's surface depends among other factors, on the altitude of the sun in the sky. As a result of absorption and scattering, the insolation is less when the sun is low in the sky than when it is higher.

87 HW stands for _____
a) High and Low water
b) High Level Waste
c) Heated Low Level water
d) High and Low Waste

Answer: b
Explanation: These are generated in reprocessing of spent fuel. They contain all fission products and contain of the transuranium elements not separated during reprocessing. Such wastes are to be disposed of carefully.

88 What is unit of nuclear radiation?
a) Reaumur
b) Roentgen
c) Rankine
d) Pascal

Answer: b
Explanation: Units of nuclear radiation is Roentgen- amount of radiation which will on passing through pure air under standard condition produce 1 electrostatic unit of ions/cm3 of air -> 86.9 ergs of energy absorbed/gm of air.

89. Which type of fuel is removed from the reactor core after reaching end of core life service?
a) Burnt Fuel
b) Spent fuel
c) Engine oil
d) Radioactive fuel

Answer: b
Explanation: Spent fuel is the unprocessed fuel that is removed from the reactor core after reaching end of core life service. It is removed and then stored for 3 to 4 months under water in the plant site to give time for the most intense radioactive isotopes to decay

90. The ocean thermal energy conversion (OTEC) is uses _____
a) Energy difference
b) Potential difference

c) Temperature difference
d) Kinetic difference

Answer: c
Explanation: The ocean thermal energy conversion uses the temperature difference between cold water and hot water to produce electricity.
91. OTEC is developed in _____
a) 1880
b) 1926
c) 1890
d) 1930

Answer: a
Explanation: The Ocean thermal energy conversion is developed in the year 1880. It is the base loaded electricity generation.
92. The OTEC is constructed in _____
a) 1920
b) 1924
c) 1922
d) 1926

Answer: d
Explanation: The OTEC is constructed in 1926. The OTEC plant pumps the sea water and run the power cycle. It is developed in 1880.
93. The by-product of the ocean thermal energy conversion is _____
a) Hot water
b) Desalinated water
c) Chemicals
d) Gases

Answer: b
Explanation: The by-product in the ocean thermal energy conversion is desalinated water. The amount of water will be in large quantity.
94. In ocean thermal energy conversion, the plant pumps the deep cold sea water and do not pump the surface sea water.
a) True
b) False

Answer: b

Explanation: The ocean thermal energy conversion, the plant pumps the large quantity of deep cold sea water and surface sea water as well to run a power cycle and produce electricity.

95. How many types of OTEC plants are there?

a) 1
b) 2
c) 3
d) 4

Answer: c

Explanation: There are three types of ocean thermal energy plants. They are closed cycle systems, open cycle ocean thermal energy conversion and hybrid ocean thermal energy conversion.

96. Closed cycle systems use the fluid having _____

a) High boiling points
b) Low boiling points
c) High viscosity
d) Low viscosity

Answer: b

Explanation: Closed cycle system uses the fluid having low boiling points. Ammonia is one of the liquids having low boiling point which is having boiling point -330C to power a turbine to generate electricity.

97. Warm surface sea water is pumped through a _____ to vaporize the fluid.

a) Heat exchanger
b) Generator
c) Evaporator
d) Condenser

Answer: a

Explanation: Warm surface sea water is pumped through a heat exchanger to vaporize the fluid. The expanded vapour turns the turbo generator to produce electricity.

98. The heat exchanger _____ the vapour into a liquid which is recycled.

a) Condenses
b) Heats
c) Cools
d) Evaporates

Answer: a

Explanation: The heat exchanger condenses the vapour into a liquid which is recycled. The surface water and the deep water is also drawn into the system.

99. Open cycle OTEC uses _____ surface water directly to make electricity.
a) Hot
b) Warm
c) Cool
d) Icy

Answer: b
Explanation: Open Cycle Ocean thermal energy conversion uses the warm surface water to produce electricity. The warm water is first pumped into the low pressure container and set to boil.
100. In some cases, the steam drives the low pressure turbine attached to the electrical generator.
a) True
b) False

Answer: a
Explanation: In some cases, the steam drives the low pressure turbine attached to the electrical generator.
101. The steam leaves the _____
a) Salts
b) Aluminium
c) Copper
d) Silver

Answer: a
Explanation: The steam leaves the salts and the all impurities when they are heated up and left in the low pressure container to giver pure and fresh water.
102. The open cycle system produces _____ water.
a) Desalinated
b) Impure
c) Contaminated
d) Chlorinated

Answer: a
Explanation: The open cycle system produces desalinated water and fresh. It is suitable for drinking, irrigation and agriculture.
103. In _____ method the sea water enters a vacuum chamber and flash evaporated.
a) Closed cycle system
b) Open cycle system
c) Hybrid OTEC
d) Neither closed nor open system

Answer: c
Explanation: In hybrid OTEC method draws the sea water into the vacuum chamber and flash evaporated similar to the open cycle system.
104. Depending on the embodiment _____ technique generate power from hydro electric turbine.
a) Closed cycle
b) Open cycle
c) Hybrid
d) Steam lift pump

Answer: d
Explanation: Depending on the embodiment steam lift pump technique generate power from hydro electric turbine either before or after the pump is used
105. How is OTEC caused?
a) By wind energy
b) By geothermal energy
c) By solar energy
d) By gravitational force

Answer: c
Explanation: OTEC is caused by solar energy indirectly. Of late harnessing tidal and wave energy has gained momentum. While OTEC has its own limitations, wave and tidal energy conversion systems can generate more energy when compared to solar energy.
106. What does OTEC stand for?
a) Ocean thermal energy cultivation
b) Ocean thermal energy conversion
c) Ocean techno energy conservation
d) Ocean thermal energy consumption

Answer: b
Explanation: Ocean thermal energy conversion (OTEC) uses the temperature difference between cooler deep and warmer shallow or surface sea water to run a heat engine and produce useful work, usually in the form of electricity. OTEC can operate with a very high capacity factor and so can operate in base mode.
107. Which country has world's largest tidal power plant?
a) Netherlands
b) South Korea
c) Laos

d) Bolivia

Answer: b
Explanation: Sihwa Lake Tidal Power Station is the world's largest tidal power installation, with a total power output capacity of 254 MW. When completed in 2011, it surpassed the 240 MW Rance Tidal Power Station which was the world's largest for 45 years. It is operated by the Korea Water Resources Corporation.

108. Which type of turbine is commonly used in tidal energy?
a) Francis turbine
b) Kaplan turbine
c) Pelton wheel
d) Gorlov turbine

Answer: b
Explanation: The Kaplan turbine is a propeller type reaction turbine that is usually immersed completely in the fluid it derives energy from. A Kaplan turbine is beneficial in that it is able to operate in lower pressure situations where Pelton or Francis turbines cannot.

109. How is water trapped from coastal waters?
a) By building canals
b) By building dams
c) By digging wells
d) By storing in tanks

Answer: b
Explanation: The tides are one of the sources of energy from the oceans. This energy can be tapped from coastal waters by building dams. Dams entrap the water at high tide and release it at low tide back to the sea.

110. Water to the turbine is allowed through the _____
a) Pipes
b) Sluice gates
c) Canals
d) Pumps

Answer: b
Explanation: A sluice is a water channel controlled at its head by a gate. A sluice gate is traditionally a wood or metal barrier sliding in grooves that are set in the sides of the waterway. Sluice gates commonly control water levels and flow rates in rivers and canals.

111. The tides are rhythmic and constant.
a) True
b) False

Answer: b
Explanation: The tides are rhythmic but not constant. They do not occur on a regular daily schedule. Their occurrence is due to balance of forces, mainly the gravitational force of the moon but also that of the sun, both acting together with that of earth to balance the centrifugal force on the water to the earth's rotation.
112. For exactly how much time does it take for one tidal cycle?
a) 22h, 20min
b) 24h, 50min
c) 20h, 10min
d) 22h, 50min

Answer: b
Explanation: It takes the Earth an extra 50 minutes to catch up to the moon. Since the Earth rotates through two tidal bulges every lunar day, we experience two high and two low tides every 24 hours and 50 minutes. Here, we see the relationship between the tidal cycle and the lunar day.
113. What type of tide is it if the difference between high and low tide is greatest?
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide

Answer: c
Explanation: The tide that occurs when the difference between high and low tides is greatest. It occurs when the moon is new or full. Spring tides result when the gravitation forces of the sun and moon are parallel to one another.
114. A tide whose difference between high and low tides is least is called as _____
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide

Answer: b
Explanation: A tide that occurs when the difference between high tide and low tide is the least. Neap tides occur when gravitational forces from the sun and moon are at right angles (perpendicular) to one another.
115. Which of the turbine can be mounted vertically and horizontally?
a) Pelton wheel
b) Kaplan turbine
c) Gorlov turbine

d) Francis turbine

Answer: c
Explanation: The Gorlov helical turbine (GHT) is a water turbine evolved from Darrieus turbine design by altering it to have helical blades/foils. Gorlov turbine can be mounted both vertically and horizontally because it is not directional.
116. What types of tides occur when there is so much interference with continents?
a) Diurnal tide
b) Neap tide
c) Spring tide
d) Ebb tide

Answer: a
Explanation: Diurnal tides occur when there is so much interference by continents, only one high tide and one low tide occur per day. This diurnal tide has a period of 24 hrs and 50 min. An area has a diurnal tidal cycle if it experiences one high and one low tide every lunar day
117. What does Heating and cooling of the atmosphere generates?
a) Thermo line circulation
b) Radiation currents
c) Convection currents
d) Conduction currents

Answer: c
Explanation: Wind energy can be economically used for the generation of electrical energy. Heating and cooling of the atmosphere generates convection currents. Heating is caused by the absorption of solar energy on the earth surface.
118. How much is the energy available in the winds over the earth surface is estimated to be?
a) 2.9 X 120 MW
b) 1.6 X 107 MW
c) 1 MW
d) 5MW

Answer: b
Explanation: The energy available in the winds over the earth surface is estimated to be 1.6 X 107 MW which is almost the same as the present day energy consumption. Wind energy can be utilized to run wind mill which in turn, is used to drive the generators.
119. How much wind power does India hold?
a) 20,000 MW
b) 12,000 MW
c) 140,000 MW

d) 5000 MW

Answer: a
Explanation: India has a potential of 20,000 MW of wind power. Wind power accounts nearly 9.87% of India's total installed power generation capacity. Generation of wind power in India mainly account from southern state of India.

120. What is the main source for the formation of wind?
a) Uneven land
b) Sun
c) Vegetation
d) Seasons

Answer: b
Explanation: Wind is free and renewable form of energy, which throughout history has been used to grind grain, power ships, and pump water. Wind is created when the sun unevenly heat the earth surface.

121. Which country created wind mills?
a) Egypt
b) Mongolia
c) Iran
d) Japan

Answer: c
Explanation: The earliest known wind mills were in Persia (Iran). These early wind mills looked like large paddle wheels. Centuries later, the people of Holland improved the basic design of wind mill. Holland is famous for its wind mills.

122. "During the day, the air above the land heats up more quickly than the air over water".
a) True
b) False

Answer: a
Explanation: During the day, the air above the land heats up more quickly than the air over water. The warm air over the land expands and raises, and the heavier, cooler air rushes in to take its place, creating winds.

123. What happens when the land near the earth's equator is heated?
a) All the oceans gets heated up
b) Small wind currents are formed
c) Rise in tides
d) Large atmospheric winds are created

Answer: d
Explanation: The large atmospheric winds that circle the earth are created because the land near the earth's equator is heated more by the sun than the land near the north and south poles. Wind energy is mainly used to generate electricity.
124. What type of energy is wind energy?
a) Renewable energy
b) Non-renewable energy
c) Conventional energy
d) Commercial energy

Answer: a
Explanation: Wind is called a renewable energy source because the wind will blow as long as the shines. Wind power, as an alternative to burning fossil fuels, is plentiful, renewable, widely distributed, clean, produces no greenhouse gas emissions during operation, consumes no water, and uses little land.

125. What are used to turn wind energy into electrical energy?
a) Turbine
b) Generators
c) Yaw motor
d) Blades

Answer: a
Explanation: Wind turbine blades capture wind energy, a form of mechanical energy, and put it to work turning a drive shaft, gearbox, and generator to produce electrical energy. Many factors affects wind turbine efficiency including turbine blade aerodynamics.
126. What is the diameter of wind turbine blades?
a) 320 feet
b) 220 feet
c) 80 feet
d) 500 feet

Answer: b
Explanation: Large utility-scale wind turbines can now generate more than a MW of electrical power each and deliver electricity directly in to the electric grid, these turbines are placed at 200 feet height at the rotor hub and have blades which are 220 feet or more in diameter.
127. At what range of speed is the electricity from the wind turbine is generated?
a) 100 – 125 mph
b) 450 – 650 mph
c) 250 – 450 mph

d) 30-35 mph

Answer: d
Explanation: Wind turbines are designed with cut-in wind speeds and cut-out speeds i.e. the wind speeds when the turbines start turning or shut off to prevent drive train damage. Typically, maximum electric generations occur at speeds of 30-35mph.

128. When did the development of wind power in India begin?
a) 1965
b) 1954
c) 1990
d) 1985

Answer: c
Explanation: The development of wind power in India began in 1990s. Presently India is the world's fourth largest wind power generator. The Indian energy sector has an installed capacity of 32.72 GW. Today India is a major player in the global wind energy market.

129. Disasters can be broadly termed as _____ types.
a) 2
b) 4
c) 5
d) 3

Answer: a
Explanation: Disasters can be accidental or intentional. Accidental disasters include natural disasters like tsunamis, hurricanes, floods, etc. Intentional are man-made disasters like, terrorism, bombing, etc.

130. The annual flood peaks in India are recorded in months of:
a) June, July
b) July, August
c) July, September
d) August, September

Answer: d
Explanation: Floods can occur during any part of the monsoon season. But, typically during months of August and September, flood peaks are recorded. On large rivers, it ranges between 60,000 and 80,000 m3/s.

131. Uttarakhand lies in zone _____ of Earthquake prone areas.
a) 5
b) 3
c) 4

d) 2

Answer: c
Explanation: There are five zones of earthquake. Zone 5 covers areas with the highest risk (intensity of MSK 1x or greater). Zone 4 covers areas liable to MSK VIII, Zone 3 to MSK VII, Zone 2 to MSK VI or less. Zone 1 area is not there in India.
132. To measure flood variability, _____ is used widely.
a) FFMI
b) FI
c) FMI
d) FFI

Answer: a
Explanation: FFMI stands for Flash Flood Magnitude Index. It is the standard deviation of logarithms to the base of 10 of annual maximum series.
133. Disaster management deals with situation that occurs after the disaster.
a) True
b) False

Answer: b
Explanation: Disaster management is a broad term and it deals with a situation prior to, during and after the occurrence of a disaster.
134. How many elements of disaster management are there?
a) 8
b) 7
c) 4
d) 6

Answer: d
Explanation: There are six distinct sets of activities. These include risk management, loss management, control of events, equity of assistance, resource management and impact reduction.
135. Which of the below is an example of slow-onset disaster?
a) Earthquake
b) Tsunami
c) Cyclone
d) Draught

Answer: d
Explanation: Disasters can also be classified as rapid-onset and slow-onset. It is based on how long they last. Rapid-onset disasters are Earthquake, Tsunami and Cyclone.

136. How many phases of disaster response are there?
a) 5
b) 4
c) 3
d) 2

Answer: a
Explanation: These are the preparatory phase, warning phase, emergency phase, rehabilitation phase and reconstruction phase.
137. The first step in preparedness planning is:
a) Analysis of data collected
b) Determination of objectives
c) Development of implementing device
d) Determination of strategy

Answer: b
Explanation: There are six steps in preparedness planning for emergency response. The first step is to determine the objectives to be met within each affected sector.
138. Tsunami detectors are placed in sea at _____ kms from shore.
a) 25
b) 100
c) 50
d) 85

Answer: c
Explanation: Coastal tidal gauges can detect tsunami closer to shore. It is placed at 50kms in the sea from shore. They are linked to land by submarine cables and give warning in time.
139. Carbon footprint can be measured by:
a) Carbon dating
b) Instruments
c) Carbon accounting
d) Formula

Answer: c
Explanation: Carbon footprint is the total set of greenhouse gas emissions caused by an individual, event, organization or product. It is expressed as carbon dioxide equivalent. It can be measured by assessment of GHG (greenhouse gas) levels or activities like carbon accounting.
140. How many types of ecological pyramids are there?
a) 3
b) 2

c) 4
d) 5

Answer: a
Explanation: Ecological pyramid is a graphical representation used to show bio productivity at each trophic level. The three types are the pyramid of energy, pyramid of numbers and pyramid of biomass.
141. A legally binding agreement between 2 or more nation states relating to environment is:
a) BEA
b) BA
c) MA
d) MEA

Answer: d
Explanation: MEA stand for Multilateral Environmental Agreement. When it is between 2 nation states, it is BEA – Bilateral Environmental Agreement. These are predominantly produced by the United Nations.
142. _____ is a programme run by UN related to sustainable development.
a) GHG indicator
b) Agenda 21
c) IPCC
d) UNEP

Answer: b
Explanation: Agenda 21 is a comprehensive blueprint of action to be taken globally, nationally and locally by governments of member nations of UN and those major groups in every area in which humans impact on the environment.
143. For a gold LEED certification, how many points are required?
a) 40-49
b) 60-79
c) 50-59
d) 80-110

Answer: b
Explanation: LEED is Leadership in Energy and Environmental Design. It has four levels – certified (40-49 points), silver (50-59), gold (60-79) and platinum (80-110 points).
144. Which of the below green building in India has received a platinum LEED certification?
a) Dabur India, Chandigarh
b) Logix Cyber Park, UP
c) Unitech Commercial Tower, Chandigarh

d) Suzlon One Earth, Pune

Answer: d
Explanation: This building can accommodate 2300 people, has used low energy materials, thus reducing carbon footprint. 90% of occupied space has access to natural daylight.

145. _____ is the conventional source for hydel power.
a) Tidal wave
b) Currents
c) Water
d) Ripples

Answer: c
Explanation: Hydel power is obtained from a high velocity of running water. It is abundantly present. It is used for a longer period of time. It is an exceptional case of conventional energy.
146. The first academic publication about ecological footprints was in:
a) 1992
b) 1990
c) 1993
d) 1994

Answer: a
Explanation: William Rees published the first ecological footprint in 1992. The concept and calculation was developed as the PhD dissertation of Mathis Wackernagel under Rees' supervision from 1990-1994.
147. Which of the below is a global scale environmental issue?
a) Eutrophication
b) Regional ozone
c) Climate change
d) Pollution

Answer: c
Explanation: These are three scales of environmental issues – local, regional and global. Climate change, global warming, stratospheric ozone less, etc. are all issues at a global level.
148. Carbon can be stored in organic matter in the form of:
a) Biomass
b) Biofuel
c) Bioenergy
d) Bio carbon

Answer: a
Explanation: It is stored in the roots of trees and organic matter for decades in the form of biomass. The carbon from these is released into the atmosphere on decomposition.
149. The 'Miracle Material' that can turn CO2 into liquid fuel is:
a) Propene
b) Copper
c) Graphene
d) Potassium

Answer: c
Explanation: Graphene quantum dots can recycle waste CO2 to fuel. Scientist Pulickel Ajayan has shown the conversion of CO2 into ethylene and ethanol using electro catalysis in lab conditions.

150. Acid rains are produced by

(a) Excess NO2 and SO2 from burning fossil fuels

(b) Excess production of NH3 by industry and coal gas

(c) Excess release of carbon monoxide by incomplete combustion

(d) Excess formation of CO2 by combustion and animal respiration. (1988, 89)

Answer and Explanation:

(a): Acid rain refers to the precipitation with a pH of less than 5. It is a mixture of H2SO4 and HNO3, the ratio of the two acids vary depending on the relative quantities of sulphur oxides and nitrogen oxides present in the atmosphere. These oxides are mainly produced by combustion of fossil fuels, smelters, industries, power plants, automobile exhausts etc.

151. Which one is not a pollutant normally?

(a) hydrocarbon

(b) Carbon dioxide

(c) Carbon monoxide

(d) Sulphur dioxide.

Answer and Explanation:

(b): The common gaseous pollutants are oxides of carbon (CO and CO2), oxides of nitrogen (NO and NO2) oxides of sulphur (SO2 and SO3), all these together contribute 90% of the global air pollution. Out of all these CO2 is not a pollutant normally, the green plants, by photosynthesis balance the CO2 and O2 ratios in the air to a great extent, whereas others like carbon monoxide, NO2 etc are poisonous gases.

152. Upper part of sea/aquatic ecosystem contains

(a) Plankton

(b) Nekton

(c) Plankton and nekton

(d) Benthos.

Answer and Explanation:

(a): Planktons are passively floating in upper water, nektons are actively swimming while benthos lead sedentary life upon the sea bottom. Planktons are producers and are present in large number.

153. Competition for light, nutrients and space is most severe between

(a) Closely related organism growing in different niches

(b) Closely related organisms growing in the same area/niche

(c) Distantly related organisms growing in the same habitat

(d) Distantly related organisms growing in different niches. (1988)

Answer and Explanation:

(b): Competition is rivalry for obtaining the same resource. Competition of light, nutrients and space is most severe between closely related organisms growing in the same area/niche, due to overproduction of population in the same area/niche.

154. A mutually beneficial association necessary for survival of both partners is

(a) Mutualism /symbiosis

(b) Commensalism

(c) Amensalism

(d) Both A and B.

Answer and Explanation:

(a): Mutualism is an association between individuals of two species, both of which are benefitted but cannot live separately under natural conditions e.g. instances of mutualism exist between animals and plants and also in between plants e.g. lichens. Ammensalism is an interaction in which one species causes harm to another spices with its toxic secretion often without gaining any benefit from the interaction. Commensalism is the relationship between individuals of two species of which one is benefitted and the other is almost unaffected i.e.; neither benefitted nor harmed.

155. What is true of ecosystem?

(a) Primary consumers are least dependent upon producers

(b) Primary consumers out-number producers

(c) Producers are more than primary consumers

(d) Secondary consumers are the largest and most powerful.

Answer and Explanation:

(c): An ecosystem may be defined as a structural and functional unit of the biosphere comprising living organisms and their non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self supporting system.

The organisms in an ecosystem are classified into 3 main categories-producers, consumers and decomposers. The consumers utilize materials and energy stored by the producers. Decomposers obtain their food molecules from the organic materials of dead producers and consumers. In a true ecosystem, producers are more than consumers (herbivores and carnivores).

156. In an ecosystem, which one shows one-way passage?

(a) Free energy

(b) Carbon

(c) Nitrogen

(d) Potassium.

Answer and Explanation:

(a): The behaviour of energy in ecosystem can be termed energy flow due to unidirectional flow of energy, Flow of energy is only in one direction i.e., from solar radiation —> producers —> heribivorous —> carnivores. This energy cannot pass in the reverse direction. There is decrease in the content and flow of energy with rise j in tropic level.

157. Green house effect is warming due to

(a) Infra-red rays reaching earth

(b) Moisture layer in atmosphere

(c) Increase in temperature due to increase in carbon dioxide concentration of atmosphere

(d) Ozone layer of atmosphere.

Answer and Explanation:

(c): The mean global temperature rise by 2° – 6°c and the concentration of carbon dioxide increases in the troposphere up to 600 ppm. Hence, the surface of the earth becomes warm which causes global warming. The phenomenon is similar to that of green house in which the glass enclosed atmosphere gets heated up due to its insulation from the rest of the environment. Hence, global warming is also known as green house effect and the gases responsible for it are called green house gases e.g CH4, CO2 etc.

158. Soil conservation is

(a) Conversion of sterile soil into fertile one

(b) Aeration of soil

(c) Erosion of soil

(d) Protection against loss.

Answer and Explanation:

(d): Soil conservation is to conserve fertile soil from the losses like heavy rainfall, drainage, high wind, flood, draught etc. Soil is the top cover of the earth in which plants can grow. The rotation of crops, contour ploughing and use of proper fertilizers help in maintaining the fertility of soil. Plantation of trees, controlled grazing of grasslands, reforestation, and prevention of forests fires will protect the erosion of top soil. The regulation of water resources to prevent flood will help not only in soil conservation but also supply an adequate water supply in the period of drought.

159. The relation between algae and fungi in lichen is

(a) Symbiosis

(b) Parasitism

(c) Commensalism

(d) Protocooperation.

Answer and Explanation:

(a): Algae and fungi in a lichen show symbiotic relationship. Fungi give support to the algae, give protection and help in absorption of water while algae provide food to fungi which is achlorophyllous. No one is harmed but both are benefitted by each other.

160. Major aerosol pollutant in jet plane emission is

(a) Sulphur dioxide

(b) Carbon monoxide

(c) Methane

(d) Fluorocarbon.

Answer and Explanation:

(d): Aerosols are chlorofluoro-hydrocarbon compounds released into air with force in the form of vapour. Main source of aerosols is the emission of jet planes, where fluorocarbons are used. These chlorofluorocarbons deplete the ozone layer in the higher atmosphere. These CFC’s have produced a hole in the ozone layer.

161. Gas released during Bhopal tragedy was

(a) Methyl isocyanate

(b) Potassium isothiocyanate

(c) Sodium isothiocyanate

(d) Ethyl isothiocyante.

Answer and Explanation:

(a): In Bhopal, the killer gas methyl isocyanate (MIC) was leaked into air from a chemical plant (Union Carbide) killing more than 2,000 people, many of the people are still suffering from various diseases and defects of eye.

162. Deforestation will decrease

(a) Soil erosion

(c) Soil fertility

(b) Land slides

(d) Rainfall.

Answer and Explanation:

(d): Deforestation is the conversion of forested areas to non-forest land use such as arable land, pasture, urban use, logged area, or wasteland. Generally, the removal or destruction of significant areas of forest cover has resulted in a degraded environment with reduced biodiversity. Deforestation results from removal of trees without sufficient reforestation, and results in declines in habitat and biodiversity, wood for fuel and industrial use, and quality of life. Due to deforestation, transpiration will be decreased, air temperature will be increased and water content will be decreased hence rainfall decreases.

163. Pyramid of numbers in a grassland/tree ecosystem

(a) Always inverted

(b) Always upright

(c) Both (a) and (b)

(d) spindle-shaped.

Answer and Explanation:

(b): Pyramid of number in a grassland/tree ecosystem is always upright. It shows the number of individual organisms at each level. In grassland, the producers, which are mainly grasses, are always maximum in number. This number then shows a decrease towards apex, primary consumers are lesser in number than the grasses; the secondary consumers are lesser in number than the primary consumers. Finally, the top consumers are least in number. Thus, the pyramid becomes upright.

164. Domestic waste constitutes

(a) Non biodegradable pollution

(b) Biodegradable pollution

(c) Effluents

(d) None

(a): Domestic waste constitutes biodegradable pollution. These are also called non-conservative pollutants. These are decomposed chemically or by activity of microorganisms into harmless products and are recycled back into the atmosphere.

165. Acid rain is due to increase in atmospheric concentration of

(a) ozone and dust

(b) CO2 and CO

(c) SO2 and CO

(d) SO2 and NO2.

Answer and Explanation:

(d): SO2 and NO2 when present in large quantities dissolved in water vapour form sulphuric acid and nitric acid which dissolve in rain water resulting in acid rain (H2SO4) and (HNO3) which in turn causes great damage to forests and vegetation.

166. A non-renewable resource is

(a) Nonrenewable nonconventional energy source

(b) Nonrenewable conventional energy source

(c) Renewable nonconventional energy source

(d) Renewable conventional energy source.

Answer and Explanation:

(b): Conventional energy resources are those energy resources which are in common use, e.g. animal power, fuel wood, fossil fuel and hydroelectric energy. These conventional energy resources are non-renewable resources.

A non-renewable resource is a natural resource that cannot be re-made, re-grown or regenerated on a sea!: comparative to its consumption. It exists in a fixed amount that is being renewed or is used up faster than it can be made by nature. Often fossil fuels, such as coal, petroleum, and natural gas are considered non-renewable resources, as they do not naturally re-form at a rate that makes the way we use them sustainable.

167. Renewable source of energy is

(a) Biomass

(b) Coal

(c) Petroleum

(d) Kerosene.

Answer and Explanation:

(a): A natural resource qualifies as a renewable resource if it is replenished by natural processes at a rate comparable to its rate of consumption by humans or other users. Biomass, in the energy production industry, refers to living and recently dead biological material which can be used as fuel or for industrial production.

Most commonly, biomass refers to plant matter grown for use as Biofuel, but it also includes plant or animal matter used for production of fibers, chemicals or heat. Biomass may also include biodegradable wastes that can be burnt as fuel. Renewable resources of energy include biomass energy and some forms of inexhaustible energy like solar energy, hydropower, wind power, tidal energy, wave energy, geothermal energy, etc. Coal, petroleum and kerosene are non-renewable resources of energy.

168. Homeostasis is

(a) Tendency of biological systems to change with change in environment

(b) Tendency of biological systems to resist change

(c) Disturbance of self regulatory system and natural controls

(d) Biotic materials used in homeopathic medicines.

Answer and Explanation:

(b): The ability to maintain a steady state within constantly changing environment is essential for the survival of living systems. The maintenance of a constant internal environment is called homeostasis.

169. Deep black soil is productive due to high proportion of

(a) Sand and zinc

(b) Gravel and calcium

(c) Clay and humus

(d) Silt and earthworm.

Answer and Explanation:

(c): Deep black soil is productive due to high proportion of clay and humus. The organic matter present in the soil is contributed by the death and decay of living organisms. These are the richest in nutrients and therefore these soils are the most fertile.

170 .Which of the following is NOT a form of precipitation

a)Sleet

b)Fog

c) Hail

d)Rain

ANS: Fog is not precipitation. Precipitation is moisture FALLING from the sky. Fog is not falling.

172. If you are under a low lying cloud that covers the whole sky, is dark, and it is heavily raining, you would most likely be under a stratus cloud

a)True

b) False

Ans: the statement is false. A low lying cloud that covers the entire sky and is gray would be a stratus cloud, but very little moisture comes out of a nimbostratus cloud.

173. It is possible that on a hot summer day in Houston, that heavy rain can start out as a snow storm high in the clouds from which they fall

a)True

b) False

ANS: Clouds can form at high altitudes where temperatures are below freezing. The type of precipitation that reaches the ground depends upon the temperature in the lower atmosphere.

174. Heavy rain, hail, lightening -- stratus clouds

a)True

b) False

ANS: the statement is False. Heavy rain, hail, lightning and thunder are associated with cumulonimbus clouds. While stratus clouds may produce precipitation, such precipitation will tend to be gentle. Lightening and hail would not be expected from stratus clouds

175. Rains in a warm cloud, falls through a freezing layer

a)Rain

b)Snow

c) Sleet

d)Freezing rain or glaze

ANS: Sleet is a frozen raindrop. In this instance, sleet began as a raindrop in a warm cloud; it was then frozen on its way to the surface.

176. Adiabatic processes are only important for air

a)Which is rising or sinking

b) That is stagnant

c) Masses which remain near the surface of the Earth

d) That is polluted

ANS: Adiabatic only has to do with cooling or warming of air caused when air is allowed to expand or is compressed.

177. Clouds are formed as a result of conduction

a)True

b)False

ANS: the statement is False. Fog is formed via conduction. Clouds are formed as a result of adiabatic cooling.

178. Liquid water in clouds with temperatures below 32 degrees F -- freezing nuclei

a)True

b) False

ANS: The statement is False. Liquid water is LIQUID. Freezing nuclei are solid particles that have a crystal form resembling that of ice. They serve as cores for the formation of ice crystals.

179. Condensation trails produced by jet aircraft that often spread out to form broad bands of cirrus clouds are called _____

a) Contrails

b) Radiation Fog

c) Bergeron Process

d) Traces of Precipitation

ANS: this is the definition of a contrail. They are produced by jet aircraft engines that expel large amounts of hot, moist air. As the air mixes with the frigid air aloft, a streamlined cloud is produced.

180. Lifting condensation level is the point at which _____ occurs

a)Cloud Formation

b)Convectional Activity

c) Frontal Activity

d)Orographic Lifting

ANS: the dew point and air temperature are equal and cloud formation occurs.

181. The ____ is associated with super cooled clouds

a)Bergeron process

b)Collision-coalescence process

c) Both a and b

d) None of these

ANS: The Bergeron process depends on the presence of both super cooled water and ice crystals -- we are talking here cold clouds.

Module - 3

181. Ground water characteristics must be monitored at least once in a _____ till design span.

a) Week b) Month

c) Day d) Quarter

Answer: d

Explanation: Ground water characteristics must be monitored at least once in a quarter till designed life span of the TSDF.

182. Ground water pH has to be analysed in monitoring.

a) True

b) False

Answer: a

Explanation: Ground water should be analysed for pH, Colour, EC, Turbidity (NTU), SS, TDS, TOC, COD, heavy metals, Fe, CN, F, As and Mn, Cl, NO_3, SO_4, TKN, Total Alkalinity, Total hardness and Total Pesticides.

183. Ground water samples should be collected at least up to a distance _____ km.

a) 2 b) 3

c) 4 d) 5

Answer: d

Explanation: Ground water samples should be collected at least up to a distance of 5 KM from the TSDF location to analyse for contamination.

184. If no open wells are available, action needs to be taken to provide at least _____ monitoring wells.

a) 1 b) 2

c) 3 d) 4

Answer: d

Explanation: If no open wells or tube wells are available, action needs to be taken to provide at least four monitoring wells (piezometric) around the TSDF.

185. How should the monitoring wells be arranged in the absence of bore wells?

a) One on up gradient and other three on the down gradient
b) One on up gradient and other two on the down gradient
c) One on up gradient and other one on the down gradient
d) One on up gradient and other four on the down gradient
Answer: a
Explanation: In the absence of bore wells monitoring wells in such a way that one on up gradient of the ground water flow and other three on the down gradient side of the ground water flow at least up to first layer aquifer.

186. The ground water flow direction has to be ascertained periodically and reported at least
a) Once in a year b) Once in two years
c) Once in three years d) Once in four years

Answer: c
Explanation: The ground water flow direction has to be ascertained periodically and reported at least once in three years so as to know any changes in the ground water flow directions.

187. The directions of the ground water flow have to be established with _____
a) State Ground Water Board b) Water Control Board
c) PCB d) SPCB
Answer: a
Explanation: The directions of the ground water flow have to be established in consultation with the State Ground Water Board or any other authority.

188. Lead content has to be checked in ground water analysis.
a) True
b) False
Answer: a
Explanation: Heavy metals such as Pb, Cd, Cu, Zn, Cr, Hg, Ni has to be monitored to prevent groundwater contamination

189. When did the Central Pollution Control Board established?
a) 1970 b) 1972
c) 1974 d) 1976
Answer: c
Explanation: The Central Pollution Control Board of India was established in 1974 under the Water Act. It is a statutory organization which comes under the Ministry of Environment, Forest, and Climate Change.

190. Who appoints the chairman of the Central Pollution Control Board?
a) Central Government b) State Government
c) Governor of the State d) President of India
Answer: a
Explanation: The Central Pollution Control Board is lead by its chairman, this chairman is appointed by the Central Government. The current acting chairman is Shri S. P. Singh Parihar. This entire board comes under Central Government.

191. Which one of the following is the apex organization in the country in the field of pollution control?
a) Water Pollution Control Board b) State Pollution Control Board
c) Central Pollution Control Board d) Air pollution Control Board
Answer: c
Explanation: The Central Pollution Control Board is the apex organization in the country in the field of pollution control. It is a technical wing of Ministry of Environment and Forest. It comes under Government of India.

192. How many officials can be nominated to the Central Pollution Control Board by the Central Government?
a) Five b) Ten
c) Twenty d) Twenty Five
Answer: a
Explanation: According to Section-3, the Central Pollution Control Board can have maximum five officials nominated by the Central Government and not more than five persons nominated by the Central Government from amongst the members of State Boards.

193. In State Pollution Control Boards, how many constitutions of committees can constitute?
a) One b) Ten
c) Not constitute any committees d) As many committees as necessary
Answer: d
Explanation: According to the constitution of committees, The State Pollution Control Board can constitute as many committees as necessary. The member of a committee shall be paid fees and allowances.
194. The Central Pollution Control Board plays an important role in abatement and control of pollution in the country.
a) True
b) False
Answer: a

Explanation: The Central Pollution Control Board plays an important role in abatement and control of pollution in the country by providing scientific information, generating relevant data, training and development of manpower, etc.

195. Where is the head office of the Central Pollution Control Board?
a) Mumbai b) Raipur
c) Mysore d) New Delhi
Answer: d
Explanation: The head office of the Central Pollution Control Board located in New Delhi. It consists of seven zonal offices and five laboratories. Here the board conducts environmental assessments and research.

196. Who decides the term of the Member Secretary in the Central Pollution Control Board?
a) Chairman of the Central Pollution Control Board b) President of India
c) Prime Minister of India d) Government of India
Answer: d
Explanation: Government of India decides the terms and services condition of the Member Secretary and also for the chairman of the Central Pollution Control Board. Rest of the members shall hold office for a term of three years.

197. What is the full form of NAMP?
a) National Air Quality Monitoring Program
b) National Air Quality Measuring Program
c) National Air Quantity Monitoring Program
d) National Air Quality Monitoring Protocol

Answer: a
Explanation: NAMP stand for National Air Quality Monitoring Program. The Central Pollution Control Board runs nationwide programs of ambient air quality monitoring which is known as National Air Quality Monitoring Program.

198. When did the Karnataka State Pollution Control Board for Prevention and Control of Water Pollution constituted?
a) 1974 b) 1978
c) 1982 d) 1985
Answer: a
Explanation: The Karnataka State Pollution Control Board for Prevention and Control of Water Pollution was constituted in 1974 by the Government of Karnataka in pursuance of the Water Prevention and Control Pollution Act, 1974.

199. In how many tier programs the inland water quality monitoring network is operating?
a) One b) Two
c) Three d) Four
Answer: c
Explanation: The inland water quality monitoring network is operating under a three tier program. The three tier programs are Global Environment Monitoring System, Monitoring of India National Aquatic Resources System and Yamuna Action Plan.

200. When did the National Green Tribunal Act constituted?
a) 2000 b) 2005
c) 2010 d) 2015
Answer: c
Explanation: The National Green Tribunal Act was constituted in 2010. It has been enacted with the objectives to provide for the establishment of a National Green Tribunal for the effective disposal of cases relating to environmental protection.

201. Which is the first country to pass the amendment in the parliament to safeguard the environment?
a) Brazil b) Denmark
c) China d) India
Answer: d
Explanation: In 1976, the Indian parliament passed the 42nd amendment to its constitution for safeguarding the environment. Thus India became the first country in the world to pass the amendment to safeguard the environment.

202. There are various pollution regulations are there.
a) True
b) False

Answer: a
Explanation: Various pollution regulations are, a) The Water Act, 1974, b) The Water Cess Act, 1974, c) The Air Act, 1981, d) The Environmental Protection Act, 1986, e) Hazardous Waste Rules, 1989, f) The Public Liability Insurance Act, 1991.

203. Groundwater containing bacteria and viruses can result in _____
a) Cholera b) Methemoglobinemia
c) Kidney problem d) Liver problem
Answer: a

Explanation: Groundwater used for drinking water containing bacteria and viruses can result in illnesses such as hepatitis, cholera, or giardiasis.

204. _____ is caused by drinking water high in nitrates.
a) Cholera b) Methemoglobinemia
c) Kidney problem d) Liver problem
Answer: b
Explanation: Methemoglobinemia or blue baby syndrome, is an illness affecting infants, caused by drinking water that is high in nitrates.

205. _____ contaminant causes kidney and liver problems if present in groundwater.
a) Benzene b) Toluene
c) Benzotoulene d) Lead
Answer: a
Explanation: Benzene, a component of gasoline, is a known human carcinogen. The serious health effects of lead are well known for learning disabilities in children, nerve, kidney, and liver problems; and pregnancy risks.

206. _____ is caused due to groundwater contamination by septic tank.
a) Cholera b) Methemoglobinemia
c) Kidney problem d) Hepatitis
Answer: d
Explanation: In areas where septic tanks are installed improperly, groundwater may become infected with hepatitis due to presence of human waste in the water supply.

207. _____ from leachate cause abdominal pain in humans in case of acute exposure.
a) Lead b) Benzene
c) Mercury d) Cadmium
Answer: a
Explanation: Lead from leachate cause abdominal pain, diarrhoea, vomiting, confusion, drowsiness, and seizures in humans in case of acute exposure.

208. _____ from leachate cause chest pain in humans in case of acute exposure.
a) Lead b) Benzene
c) Mercury d) Cadmium
Answer: d
Explanation: Cadmium from leachate cause metallic taste, cough, chest pain, nausea, diarrhea, skin irritation in humans in case of acute exposure.

209. _____ from leachate can lead to coma in humans in case of acute exposure.

a) Lead b) Benzene
c) Phenol d) Cadmium
Answer: c
Explanation: Phenol or cresols from leachate can lead to coma, burning pain in the mouth and throat, nausea, vomiting, diarrhea, sweating, and shock in humans in case of acute exposure.

210. _____ from leachate can lead to gum disease in humans in case of acute exposure.
a) Nickel b) Benzene
c) Phenol d) Cadmium
Answer: a
Explanation: Nickel from leachate can lead to gum disease, skin irritation, dermatitis, and diarrhoea in humans in case of acute exposure.

211. Leachate containing lead causes _____ in humans in case of long term exposure.
a) Anorexia b) Tremor
c) Anaemia d) Renal failure
Answer: a
Explanation: Lead causes anorexia, abdominal pain, constipation, chronic nephropathy, and hypertension in humans in case of long term exposure.

212. Leachate containing mercury causes _____ in humans in case of long term exposure.
a) Anorexia b) Tremor
c) Anaemia d) Renal failure
Answer: b
Explanation: Mercury causes tremors, memory loss, seizures, coma, irritability, acute kidney failure, decrease in platelets, anaemia that follows gastrointestinal bleed in humans in case of long term exposure.

213. _____ regulates ground water that is shown to have a connection with surface water.
a) CWA b) SDWA
c) RCRA d) CERCLA
Answer: a
Explanation: The Clean Water Act regulates ground water that is shown to have a connection with surface water. It sets standards for allowable pollutant discharges to surface water.

214. SDWA established _____ drinking water source protection programs.
a) 1 b) 2
c) 3 d) 4
Answer: c

Explanation: The Safe Drinking Water Act (SDWA) established three drinking water source protection programs: the Wellhead Protection Program, Sole Source Aquifer Program, and the Source Water Assessment Program.

215. _____ regulates treatment and storage of hazardous waste to prevent contamination.
a) CWA b) SDWA
c) RCRA d) CERCLA
Answer: c
Explanation: The Resource Conservation and Recovery Act (RCRA) regulates treatment, storage, and disposal of hazardous and non-hazardous wastes to prevent contamination.

216. _____ act authorizes the government to clean up contamination from hazardous substances.
a) CWA b) SDWA
c) RCRA d) CERCLA
Answer: d
Explanation: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) authorizes the government to clean up contamination or sources of potential contamination from hazardous waste sites or chemical spills, including those that threaten drinking water supplies.

217. _____ regulates pesticide use to prevent groundwater contamination.
a) FIFRA b) SDWA
c) RCRA d) CERCLA
Answer: a
Explanation: The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulates pesticide use and Toxic Substances Control Act (TSCA) regulates manufactured chemicals to prevent groundwater contamination.

218. The water which in a state of downward movement under gravity is _____
a) Groundwater b) Vadose water
c) Connate water d) Juvenile water
Answer: b
Explanation: Vadose water, which occurs from surface downwards up to a variable depth and is in a state of downward movement under the influence of gravity.

219. What is the process of movement downwards of vadose water called?
a) Infiltration b) Filtration
c) Deposition d) Down-flow
Answer: a

Explanation: The movement of vadose water is commonly described as infiltration. The thickness of soil and rock through which the vadose water infiltrates is called the zone of aeration.

220. What is the upper surface of the zone saturation called?
a) Aquifer`
b) Aquiclude
c) Water table
d) Aquifuge
Answer: c
Explanation: Water table is the name given to the upper surface of the zone of saturation and is of fundamental importance in the study of groundwater reservoirs.
221. Pick the wrong statement about groundwater.
a) It is turbid
b) It is odourless
c) It is free from pathogens
d) It is coloured
Answer: d
Explanation: Groundwater has a suitable composition in most cases and is free from turbidity, objectionable colours and pathogenic organisms requiring not much treatment.

222. Groundwater is not safer than other sources of water.
a) True
b) False
Answer: b
Explanation: The groundwater is relatively much safe from hazards of chemical, radiogenic and biological pollution to which surface water bodies are badly exposed.

223. What is the water obtained from precipitation called?
a) Meteoric water
b) Connate water
c) Juvenile water
d) Secondary water
Answer: a
Explanation: Meteoric water is the water derived from precipitation (rain and snow). Although bulk of rainwater or meltwater from snow and ice reaches the sea through surface flows or run off, a considerable part of precipitation gradually infiltrates into the ground.

224. Water present in rocks from the time of their deposition is _____
a) Meteoric water
b) Connate water
c) Juvenile water
d) Secondary water

Answer: b
Explanation: Connate water is the water present in the rocks right from the time of their deposition in an aqueous environment.

225. What is usually the nature of connate water?
a) Sweet b) Odour
c) Salty d) Odourless
Answer: c
Explanation: This connate water may be encountered in sedimentary rocks like limestones, sandstones and gravels. It is commonly saline in nature and is of no importance as a source for exploitable groundwater.

226. Juvenile water is also called _____
a) Meteoric water b) Connate water
c) Magmatic water d) Secondary water
Answer: c
Explanation: Juvenile water is also called magmatic water and is of only theoretical importance as far as water-supply schemes are concerned.

227. Some hot springs are derived from which water?
a) Meteoric water b) Connate water
c) Juvenile water d) Secondary water

Answer: c
Explanation: Juvenile water is the water formed in the cracks or crevices or pores of rocks due to condensation of steam given out from hot molten masses or magmas existing below the Earth's surface. Some hot springs and geysers are clearly derived from juvenile water.
228. The vadose water which is lost to the atmosphere by transpiration and evaporation is _____
a) Soil water b) Intermediate water
c) Phreatic water d) Water table

Answer: a
Explanation: The soil water is very important for the life and growth of the vegetable cover of the globe. It is lost to the atmosphere by transpiration and evaporation.
229. Which zone is a zone of non-saturation among vadose water?
a) Soil water b) Intermediate water
c) Phreatic water d) Water table

Answer: b
Explanation: The intermediate vadose zone occurs immediately below the zone of soil water. It is in fact a zone of non-saturation: water in this zone is moving downwards under the influence of gravity.

230. Which zones are together called zone of aeration?
a) Soil water and intermediate zone b) Intermediate zone and zone of capillary water
c) Zone of capillary water and phreatic water d) Soil water and phreatic water

Answer: a
Explanation: The intermediate zone is generally of small thickness and may be even absent in many cases. The soil water and intermediate zones are sometimes collectively referred to as the zone of aeration.
231 The zone of water which occurs only in fine particle size is _____
a) Soil water b) Intermediate water
c) Phreatic water d) Zone of capillary water

Answer: d
Explanation: The zone of capillary water, called capillary fringe is present only in the solids and rocks of fine-sized particles underlying the vadose zone. It is absent in the coarse sediments.
232. Which vadose water zone is also called the zone of saturation?
a) Soil water b) Intermediate water
c) Phreatic water d) Zone of capillary water

Answer: c
Explanation: The phreatic water zone, also called the zone of saturation lies below the capillary fringe, and it is the water held in this zone that is called groundwater in the real sense
233. Storm water can even occur as snow melts.
a) True
b) False

Answer: a
Explanation: Storm water, also spelled stormwater, is water that originates during precipitation events and snow/ice melts. Stormwater can soak into the soil (infiltrate), be held on the surface and evaporate or runoff and end up in nearby streams, rivers or other water bodies (surface water).
234. Which of the following is not a negative effect of storm water?
a) Volume b) Runoff
c) Potential contaminants d) Evaporation

Answer: d
Explanation: In developed environments, unmanaged storm water can create two major issues: one related to the volume and timing of runoff water (flooding) and the other related to potential contaminants that the water is carrying (water pollution).
235. Pollutants entering surface waters during precipitation events is termed _____

a) Runoff b) Polluted runoff
c) Contaminated runoff d) Water flow

Answer: b
Explanation: Pollutants entering surface waters during precipitation events is termed polluted runoff. Daily human activities result in the deposition of pollutants on roads, lawns, roofs, farm fields, etc.
236. Water is recycled into the atmosphere by vegetation through the process called _____
a) Evaporation b) Evapotranspiration
c) Precipitation d) Runoff

Answer: b
Explanation: Before development occurred most rainfall soaked into the ground and contributed to groundwater recharge or was recycled into the atmosphere by vegetation through evapotranspiration.
237. Stream erosion can be caused by excess _____
a) Precipitation b) Evapotranspiration
c) Penetration d) Transpiration

Answer: a
Explanation: Stream erosion can be caused by excess pollutants from the increased stormwater flow. It can further lead to weed invasion and alter natural flow regimes.
238. Storm water is a major cause of urban flooding.
a) True
b) False

Answer: a
Explanation: Storm water is a major cause of urban flooding. When the storm water overwhelms the capacity of drainage systems, urban flooding is caused.
239. Which of these is a single event?
a) Monsoon rain b) Flash flood
c) Flood d) Volcano eruption

Answer: b
Explanation: Flash flood is considered as a single event. It occurs for a short period of time without prior notice and with major after effects.
240. What is the amount spent in the UK every year because of flooding?
a) £250 b) £260
c) £270 d) £280

Answer: c
Explanation: According to the Federal Emergency Management Agency almost 40 percent of small businesses never reopen their doors following a flooding disaster. In the UK, urban flooding is estimated to cost £270 million a year (as of 2007) in England and Wales; 80,000 homes are at risk.
241. When was SWMM developed?
a) 1970 b) 1980
c) 1990 d) 2000

Answer: a
Explanation: SWMM was first developed in 1970 and has undergone four major upgrades since those years. It stands for Storm Water Management System.
242. Which year was the SWMM approved?
a) 2000 b) 2002
c) 2005 d) 2008

Answer: c
Explanation: SWMM 5 was approved FEMA Model Approval Page in May 2005 with this note about the versions that are approved on the FEMA Approval Page SWMM 5 Version 5.0.005 (May 2005) and up for NFIP modeling.
243. In which of the months does the maximum sewage flow occur in India?
a) March b) May
c) July d) September

Answer: c
Explanation: In India, the maximum sewage flow occurs in the month of June and July. This is because maximum precipitation occurs in these months. Hence the adequate storm water creates maximum sewage.
244. _____ poisoning water in Japan is from fishes.
a) Bismuth b) Arsenic
c) Antimony d) Palladium
Answer: b
Explanation: The arsenic poisoning water in Japan is from fishes where the industrial effluent was going into the sea containing arsenic.
245. Fishes can store more quantity of _____ in their bodies.
a) Mercury b) Bismuth
c) Palladium d) Chlorine
Answer: a

Explanation: Fishes can store more quantity of mercury. They can also store lead and arsenic in their bodies.

246. Waste water released from _____ are not the sources of bacteria.
a) Sanitaria b) Municipalities
c) Tanning d) Industries

Answer: d
Explanation: Wastewater released from the sanitarians, municipalities, tanning and slaughtering plants are the sources of the bacteria.
247. Bacteria and microorganisms present in the water will cause _____ in human and animals.
a) Indigestion b) Intestinal tract
c) Brain tumour d) Cancer
Answer: b
Explanation: Bacteria and micro organisms present in the water will cause intestinal tract. The infected individual has the intestinal discharge containing the billions of pathogens.
248. Infectious hepatitis is caused by _____
a) Bacteria b) Viruses
c) Protozoa d) Helminth
Answer: b
Explanation: The infectious hepatitis is caused by viruses. The viruses in water also cause the poliomyelitis disease.
249. Amoebic dysentery is caused by _____
a) Viruses b) Bacteria
c) Helminth d) Protozoa

Answer: d
Explanation: Amoebic dysentery is caused by the protozoa present in the drinking water. In this disease, the water content from the body is lost and the person will become weak.
250. Bacteria in water causes _____
a) Malaria b) Typhoid
c) Dengue d) Chicken guinea

250. Helminth in the water causes _____
a) Hook worm b) Amoebic dysentery
c) Cholera d) Typhoid

Answer: a
Explanation: Helminth in the water causes the hook worm and also the guinea worm in the person. Amoebic dysentery is caused by the protozoa and cholera and typhoid is caused by the bacteria in water.

251. The _____ is an important requirement of the aquatic life.
a) Dissolved nitrogen b) Dissolved chlorine
c) Dissolved oxygen d) Dissolved methane
Answer: c
Explanation: The dissolved oxygen is an important requirement of the aquatic life. They take oxygen from the water to survive.

252. The optimum value in natural water is _____
a) 2-4ppm b) 4-7ppm
c) 4-6ppm d) 2-7ppm
Answer: c
Explanation: The optimum value in natural water is about 4-6ppm. Decrease in the quantity of the dissolved water indicates the pollution of water.

253. What is the full form of BOD?
a) Biochemical oxygen demand b) Biological oxygen demand
c) Biometric oxygen deep water d) Biological oxygen deep water
Answer: a
Explanation: The BOD is the full form biochemical oxygen demand. The amount of oxygen is taken as the measure of the quantity of organic matter is called as the BOD.

254. COD is the short form of the chemical oxygen demand.
a) True
b) False
Answer: a
Explanation: COD is the short form of the chemical oxygen demand. The total organic content present in water is determined in another parameter called COD.

255. The disappearance of the plants and animals is due to the _____ in water.
a) Nitrogen depletion b) Chlorine depletion
c) Oxygen depletion d) Ozone depletion
Answer: c
Explanation: The disappearance of the plants and animals is due to the depletion of the oxygen in the water. Microorganisms mainly bacteria uses the organic matter in water as food.

256. The decomposition of the matter produces into _____ and in presence of _____

a) Carbon dioxide and oxygen b) Oxygen and nitrogen
c) Nitrogen and carbon dioxide d) Nitrogen and chlorine
Answer: a
Explanation: The organic matter present in the water is of two types. They are biologically oxidisable and biologically inert.

257. In which temperature soil develops slowly?
a) Summer b) Wind
c) Rainy d) Cold
Answer: d
Explanation: Climate and time play an important role in the development of soils. In extremely dry or cold climates, soils develop very slowly, while in humid and warm climates soil develop more rapidly due to favourable climatic conditions.

258. Under ideal climatic conditions how many cms of soil is developed?
a) One b) Two
c) Three d) Four
Answer: a
Explanation: Under ideal climatic conditions, soft parent material may develop into 1 cm of soil within 15 years. Under poor climatic conditions, hard parent material may require hundreds of years to develop into the soil.

259. What is called for the matured soils which are arranged in a series of zones?
a) Soil zones b) Soil layers
c) Soil horizons d) Soil benches
Answer: c
Explanation: Mature soils are arranged in a series of zones called soil horizons. Each horizon has a distinct texture and composition that varies with the different types of soil. This soil horizon helps to discriminate different types of soils.

260. What is soil profile?
a) A cross sectional view of the horizons in a soil b) A front view of the horizons in a soil
c) A cross sectional view of the horizons in rocks d) A front view of the horizons in rocks
Answer: a
Explanation: A cross-sectional view of the horizon in a soil is called a soil profile. This soil profile can able to identify the special characteristics present in the soils and this can be used as a referral while studying a soil pollution causing by different soils.

261. How many horizons are there in soils?
a) One b) Two
c) Three d) Four
Answer: d
Explanation: There are four horizons in soils. The top layer is known as O-horizon. The uppermost layer of soil called as the A-horizon. The B-horizon called the subsoil, it contains less organic material. The area below the subsoil is called as the C-horizon.

262. A–horizon soil consists of partially decomposed organic matter.
a) True
b) False
Answer: a
Explanation: The uppermost layer of the soil, called the A-horizon. It consists of partially decomposed organic matter and some inorganic mineral particles. This layer consists of a large amount of bacteria, fungi and other small insects, which form complex food webs in the soil.

263. Which horizon helps to determine the pH of the soil?
a) A b) B
c) C d) O
Answer: c
Explanation: The chemical composition of the C-horizon helps to determine the pH of the soil and also influences the soil's rate of water absorption and it also C-horizon helps in the process of retention of water.

264. What is called for the mixture of all the contents of soil?
a) Erosion b) Sublimation
c) Degradation d) Loams
Answer: d
Explanation: Soil varies in their content of clay, silt, sand and gravel. The relative amounts of the different sizes and types of mineral particles determine the soil texture. Soils with an approximately equal mixture of clay, sand, slit and humus are called loams.
265. Why area treatment is important for soil?
a) To reduces the impact of raindrops on the soil b) To maximize surface run-off
c) Not treating the upper catchment and proceeds towards an outlet d) Not storing surplus rainwater

Answer: a
Explanation: Area treatment in soil reduces the impact of raindrops on the soil. The treatment measures are to develop vegetation cover on non-arable land. It effects in minimum disturbance and displacement of soil particles.

266. What is called for the movement of surface litter and topsoil from one place to another?
a) Soil submerge b) Soil degradation
c) Soil erosion d) Soil pollution

Answer: c
Explanation: Soil erosion is a natural process, it is often caused by wind and flowing water. It is greatly accelerated by human activities such as farming, construction, over grazing by livestock and burning of grass cover and deforestation.
267. Why continuous contour trenches are used?
a) To decrease the infiltration of air b) To enhance the infiltration of air
c) To decrease the infiltration of water d) To enhance the infiltration of water

Answer: d
Explanation: Continuous contour trenches can be used to enhance the infiltration of water. It also used to reduce the run-off and check soil erosion. In areas with steep slopes where bunds are not possible, continuous contour benches are used for the same purpose.
268. What is used to convert wastelands into agricultural lands?
a) Check dams b) Water purifier
c) Rain harvesters d) Gradonies

Answer: d
Explanation: Gradonies can be used to convert wastelands into agricultural lands. In this, narrow trenches with buds on the downstream side are built along contours in the upper reaches of the catchment to collect run-off and to conserve moisture from the trees.

269. Organic agriculture advocates avoiding the use of_____
a) Organic manure b) Stored water
c) Modern technologies in harvesting d) Chemical fertilizers
Answer: d
Explanation: Organic agriculture advocates avoiding the use of chemical fertilizers and pesticides. This chemical fertilizers cause soil pollution and it also harms the health of organisms including humans which depend on plants for food.

270. Integrated pest management reduces the excess use of fertilizers.
a) True
b) False
Answer: a
Explanation: One of the ways to reduce the use of fertilizers and pesticides is by integrated pest management. This is a technique that uses a complete understanding of all the ecological aspects of a crop and the particular pests to which it is susceptible.

271. What is noise?
a) Desirable sound b) Desirable and unwanted sound
c) Undesirable and unwanted sound d) Undesirable and wanted sound
Answer: c
Explanation: Noise is defined as an undesirable and unwanted sound. Noise pollution affects human health and can contribute o a general deterioration of environmental quality. Several sources of noise pollution contribute to both indoor and outdoor noise pollution.

272. In which unit sound is measured?
a) Kilometer b) Pascal
c) Kilogram d) Decibel
Answer: d
Explanation: Noise pollution is measured in terms of decibel (dB). This parameter depends on the various environmental conditions. If the decibel level increased than the threshold it causes problems to humans and other organisms.

273. Which pollution cause hearing loss in organisms?
a) Air pollution b) Noise pollution
c) Water pollution d) Soil pollution
Answer: b
Explanation: Noise pollution can cause various health impacts on humans and other organisms. This health impacts leads to various issues like reduced in the mental health, hearing loss either temporary or permanent, loss in efficiency and many more.

274. What is the dB of a threshold of hearing?
a) 0 b) 10
c) 50 d) 100
Answer: a
Explanation: Decibel of the threshold of hearing is 0, for the rustle of leaves the dB is 10, for broadcasting studio dB is 20 and for Bedroom at night the dB is 30. This dB various based on the noise and the environmental conditions.

275. What is the dB of a threshold of pain?
a) 100 b) 110
c) 120 d) 146
Answer: d
Explanation: Threshold of pain is described as the maximum level in which one can sustain the noise after this the noise and cause several health related issues and it even damage the hearing capacity permanently or temporarily.

276. All sound is noise.
a) True b) False
Answer: b
Explanation: Not all sound is noise. Sound is the voice below of the threshold of pain where organisms can listen to the voice without any struggle. But noise is the disturbance that arises in the sound and cause problems to organisms.

277. At what decibel instantaneous rupture of membrane happens?
a) 100 b) 120
c) 146 d) 150
Answer: d
Explanation: Instantaneous rapture of the membrane occurs at the decibel of 150. Threshold of pain is caused at the decibel of 146. If the noise level increased to 150 decibels than within no time there will be an instantaneous rupture of membrane occurs.

278. What is the ambient noise level in the residential one during night time?
a) 40 dB b) 45 dB
c) 50 dB d) 55 dB

279. What is called for a temporary hearing loss?
a) Temporary ear pain b) Temporary hearing problem
c) Temporary threshold shift d) Temporary hearing shift
Answer: c
Explanation: Temporary hearing loss is often called a ‘temporary threshold shift’. People suffering from this condition are unable to detect weak sounds. If a person got this problem, hearing ability is usually recovered within a month of exposure.
280. What is the permissible noise limit of 120 db?
a) 30 minutes b) 2 minutes
c) 1 minute d) 30 seconds
Answer: d
Explanation: One can hear 120 db for a duration of 30 seconds. For 30 seconds the permissible noise limits is 120 db. If someone hear more than this duration there are high chances of hearing loss and other mental health issues.

281. At what level a sound becomes physical pain?
a) Above 50 dB b) Above 70 dB
c) Above 80 dB d) Above 100 dB
Answer: c

Explanation: Sound is measured in terms of decibels (db). World Health Organization prescribed optimum noise level as 45 db during day time and 35 db during night time. Anything above 80 db is hazardous.

282. Which of the following sound is pleasant to our ears?
a) Heavy machinery b) Transportation equipment
c) Loud noise d) Music
Answer: d
Explanation: Among the above options music is the only sound which pleasant our ears rest of the sounds cause irritation by its unpleasant noise and cause damage to the hearing permanently or temporarily.

283. Wildlife faces more problems than humans due to noise pollution, because animals dependent on_____
a) Noise b) Sound
c) Actions d) Behavior
Answer: b
Explanation: Animals develop a better sense of hearing than us since their survival depends on it. Wildlife faces far more problems than humans because wildlife depends on sound to protect themselves from enemies more than humans.

284. The degree of hearing loss depends on the duration as well as the intensity of the noise.
a) True
b) False
Answer: a
Explanation: For example, one hour of exposure to a 100 db sound level can produce a temporary threshold shift that may last for about one day. In factories workers subjected to high sounds for several hours in a day. It will cause hearing loss and other mental issues

285. When did the Noise Pollution Regulations and Control Rule established in India?
a) 2000 b) 2004
c) 2005 d) 2007
Answer: a
Explanation: The Noise Pollution Rules established in 2000. They shall come into force on the date of their publication in the official gazette. In these rules, unless the context otherwise requires, ‘Act’, ‘Area’, ‘Authority’, ‘Person’ and ‘State Government’.

286. What timings loud speakers shouldn’t use in public areas?
a) 10:00 pm to 5:00 am b) 1:00 am to 7:00 am
c) 11:00 pm to 6:00 am d) 10:00 pm to 6:00 am

Answer: d
Explanation: A loud speaker or a public address system shall not be used between 10:00 pm to 6:00 am, except in closed premises or communication within auditoria, conference rooms, community halls and banquet halls, etc.

287. When can a person complaint to the police regarding noise pollution level?
a) When the ambient noise standards exceeds by 10 dB
b) When the ambient noise standards exceeds by 20 dB
c) When the ambient noise standards exceeds by 30 dB
d) When the ambient noise standards exceeds by 50 dB
Answer: a
Explanation: A person can complaint to the authority if the noise level exceeds the ambient noise standards by 10 dB or more given in the corresponding columns against any area, make a complaint to the authority.

288. What is the meaning of silence zone for noise pollution?
a) Area comprising more than 100 meters around hospitals and educational institutes
b) Area comprising not less than 100 meters around hospitals and educational institutes
c) Area comprising more than 100 meters around clubs and commercial streets
d) Area comprising not less than 100 meters around clubs and commercial streets
Answer: b
Explanation: Silence zone is defined as an area comprising not less than 100 meters around hospitals, education institutes and courts. The silence zones are zones which are declared as such by the competent authority.

289. When did the Factories Act constitute in India?
a) 1930 b) 1947
c) 1948 d) 1956
Answer: c
Explanation: The Factories Act is constituted in 1948 in India. Section 11 (1) of the Act stipulates that every factory shall be kept clean, without having any nuisance. The word nuisance may include noise and thus it regulates the workers safety.

290. The State Government shall take measures for abatement of noise.
a) True b) False
Answer: a

291. Which Ministry published a draft of Noise Pollution Rules?

a) Ministry of Foreign Affaires b) Ministry of Pollution Control
c) Ministry of Industries d) Ministry of Environment and Forests
Answer: d
Explanation: A draft of Noise Pollution Rules was published under the notification of the Government of India in 1999 under the Ministry of Environment and Forests vide number S.O. 528 (E). This Act maintaining noise pollution.

292. In which year the Motor Vehicles Act came into force?
a) 1983 b) 1984
c) 1988 d) 1990
Answer: c
Explanation: The Motor Vehicles Act through various sections empowers a state government to frame rules for the upkeep of motor vehicles and control of noise produced by them. Strong implementation of this Act will reduce the noise pollution efficiently.

293. One of the efficient ways to control aircraft noise is_____
a) Building aircrafts with old technologies
b) Maximize the passengers to 100
c) Increase the amount of pressure it can withstand
d) Constructing aerodromes far away from the residential areas
Answer: d
Explanation: The Aircrafts Act has many provisions but none for the control of noise. In this regard it is suggested that aerodromes be constructed far away from the residential areas of a city in order to protect residents from the noise of aircrafts.

294. In which section, if a person violates the noise pollution regulations, is liable for penalty?
a) Section 12 b) Section 15
c) Section 18 d) Section 19
Answer: b
Explanation: Any person who violating the noise pollution rules will be liable for penalty under the Act. Section 15 of the Act provides that any person contravening the provisions of the Act be punishable with imprisonment or fine.

295. What is the db level for heavy vehicles in India?
a) 70 b) 75
c) 77 d) 80
Answer: d
Explanation: Decibel (db) is the unit of noise. There are different noise limits for vehicles as well depending upon the capacity of their engines. 80 db is the standard noise limit which has been accepted by Government of India for heavy vehicles.

296. What are the ambient air quality standards in industrial area during day time?
a) 75 db b) 80 db
c) 85 db d) 100 db
Answer: a
Explanation: Ambient air quality standards in respect to noise various from one zone to another and it also various for day time and also for night time. The ambient air quality standards in industrial area during day time are 75 db and during night it is 70 db.

297. In which Act, noise is included as an environmental pollutant?
a) 1974 b) 1981
c) 1988 d) 1994
Answer: b
Explanation: Noise though not defined in any statute but it is included as environmental pollutants in Section (a) of the Air Act 1981. After this included noise is recognized as a kind of air pollution and steps are taken to control it efficiently.

298. Loud speakers cause noise.
a) True b) False
Answer: a
Explanation: Extensive use of loud speakers whether for political meetings, religious functions, marriages, musical nights, etc are most disturbing source of noise to the urban dwellers in particular and strong action must be take regarding this.

300. What is the primary standard level for carbon monoxide for assuring air quality?
a) 10ppm b) 90ppm
c) 1ppm d) 9ppm
Answer: d
Explanation: The primary standard level for carbon monoxide is 9ppm.

301. The pulmonary section of the respiratory tract consists of _____
a) Nose and mouth as well as down till epiglottis and larynx
b) Bronchi down till the end of bronchiole
c) Respiratory bronchiole, alveoli and alveoli ducts
d) Alveoli ducts and alveoli
Answer: c
Explanation: Respiratory bronchiole, alveoli and alveoli ducts are categorised under the pulmonary section of the respiratory tract.

302. What is the primary function(s) of the alveoli?

a) Transfer of oxygen to the blood
b) Removal of carbon dioxide from the blood
c) Transfer of toxic substances to the blood
d) All of the mentioned
Answer: d
Explanation: The thin walls of the alveoli contain capillaries which aid in transfer of oxygen and toxic substances into the blood and removal of carbon dioxide.

302. The velocity of air reduces to zero by the time it reaches the bronchi.
a) True
b) False
Answer: b
Explanation: The velocity of air reduces to zero only when it reaches the alveoli and not the bronchi.

303. Particles of what size are filtered by the nasal passage?
a) >10micrometre b) >500 micrometre
c) >1 mm d) >5 micrometre
Answer: a
Explanation: The moist nasal passage can capture dust particles above 10 micrometre.

304. What is the effect of ozone on human respiratory system?
a) It has higher affinity to bind with haemoglobin 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
Answer: c
Explanation: Ozone scars lung tissues when exposed for a long time and it intensifies asthma by increasing the individual's sensitivity towards allergens.

305. Which of the following pollutants is the major contributor to photochemical smog?
a) Peroxynitrates b) Hydroperoxides
c) Nitrogen dioxide d) Ozone
Answer: d
Explanation: Ozone is the major constituent of photo-chemical smog.

306. 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
Answer: b
Explanation: Sulphur dioxide interrupts our immunity towards particulate matter and allows bacteria to enter through our respiratory system.

307. 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
Answer: b
Explanation: Generally, air pollution increases with increase in temperature because it leads to increase in ground level ozone, nitrogen dioxide concentrations increase since higher temperature favours the oxidation of nitrogen monoxide.

308. Ocean is a source for carbon monoxide.
a) True
b) False
Answer: a
Explanation: It was earlier assumed oceans served as a sink, but marine organisms contribute enough carbon monoxide to highly saturate the ocean surface

309. When did the air pollution on earth happened first time?
a) When humans started using tools b) When humans started using firewood
c) When humans started using clothes d) When humans started using wheels
Answer: b
Explanation: The origin of air pollution on earth can be traced when humans started using firewood as a means of cooking and heating food items. Back in 400 BC itself, Hippocrates mentioned air pollution. As the years passed air pollution keeps on increasing.

310. Who made the first anti-pollution law?
a) Martin Luther King
b) Nelson Mandela
c) Queen Elizabeth
d) King Edward 1
Answer: d
Explanation: King Edward 1 makes the first anti-pollution law to restrict people from using coal for domestic heating in the year 1273. In 1300 another act for banning the use of coal passed. Defying the law led to severe punishment.

311. Which was the first major disaster of air pollution?
a) New York smog
b) London smog
c) Paris smog
d) Delhi smog
Answer: b
Explanation: Air pollution became a serious problem in London during the Industrial Revolution. The earliest recorded major disaster was the London smog that occurred in 1952, which resulted in more than 4000 deaths.

312. What is the significance of black color moth in Europe during 19th century?
a) Indication of evolution b) Indication of soil pollution
c) Indication of mutation d) Indication of air pollution
Answer: d
Explanation: In Europe during 19th century, a black form of the peppered moth began appearing in industrial areas. The normal pepper patterned moths were successful in surviving in clean non-industrial areas, only black colored moths were successfully adopted themselves in industrial areas.

313. What is the main cause of increase in air pollution in the 20th century?
a) Development of the transport system b) Development of infrastructures
c) Development of electricity d) Development of water resources
Answer: a
Explanation: In 20th-century air pollution began to increase with the development of transportation systems and the large scale use of petrol and diesel usage. Pollution due to auto exhaust is a serious environmental issue.

314. Natural causes also results in air pollution.
a) True
b) False
Answer: a
Explanation: The air also becomes polluted by natural causes such as volcanoes which results in ash, dust, sulphur and other gases. Occasionally due to lightning forest fires also happens which results in the loss of vegetation and also cause air pollution.

315. How many primary pollutants are there?
a) Three b) Five
c) Seven d) Nine
Answer: b

Explanation: Pollutants that are emitted from identified sources which are produced by both by natural events and by manmade activities are known as primary pollutants. The five primary pollutants are carbon oxides, nitrogen oxides, sulphur oxides, volatile organic compounds and suspended particulate matter.

316. What are secondary pollutants?
a) Pollutants due to fire
b) Pollutants due to emission
c) Pollutants due to a chemical reaction
d) Pollutants due to oxidation
Answer: c
Explanation: The pollutants produced in the atmosphere when certain chemicals reactions take place among the primary pollutants are called secondary pollutants. Some of the examples of secondary pollutants are sulphuric acid, nitric acid and carbonic acid.

317. Which is the colorless, odorless and toxic gas which produced when organic materials incompletely burn?
a) Sulphur oxide
b) Carbon monoxide
c) Oxygen
d) Particulates
Answer: b
Explanation: Vehicular exhausts are the largest single source of carbon monoxide. It is a colorless, odorless and toxic gas produced when organic materials like natural gas or wood are incompletely burnt.

318. Which of the following cause soot in the environment?
a) Hydrocarbons
b) Nitrogen oxide
c) Sulphur oxide
d) Particulates
Answer: d
Explanation: Particulates are small pieces of solid material like dust particles and ash from industries which dispersed into the atmosphere. Repeated exposure to particulates causes them to accumulate in the lungs and cause severe problems.

319. What is aerosol?
a) General term for particles in air
b) General term for particles in soil
c) General term for particles in water
d) General term for particles inside humans
Answer: a
Explanation: Aerosol is a general term which is used to express the meaning for the particles which are suspended in air. This aerosol contributes to air pollutants as they join other materials in the atmosphere. Sprays from pressurized cans are an example of aerosol.

320. What is smog?
a) Mixture of smoke and particulates
b) Mixture of smoke and oxygen

c) Mixture of smoke and fog d) Mixture of soot and fog
Answer: c
Explanation: Aerosol is a general term for particles suspended in air. Those aerosols when came into contact with water droplets they constitute fog. So smog is a term used to describe a mixture of smoke and fog.

321. Aerosol + solid particles + liquid particles results in_____
a) Dust b) Mist
c) Smog d) Smoke
Answer: d
Explanation: Aerosol consisting of solid particles or a mixture of solid and liquid particles produced by chemical reactions such as fire is known as smoke. Smoke from the burning forest, cigarette smoke, smoke by chimneys is some of the examples of smoke.

322. Use of unleaded petrol is one way of reducing pollutant.
a) True
b) False
Answer: a
Explanation: Lead is a major air pollutant that remains largely unmonitored and is emitted by vehicles. High lead levels have been reported in big cities. Leaded petrol is the primary source of this pollutants, so unleaded petrol is a way to reduce this pollutant

323. Which of the following is used in ceramic industries?
a) Electrostatic precipitator b) Dynamic precipitator
c) Spray tower d) Wet cyclonic scrubber
Answer: b
Explanation: Dynamic precipitator is used in ceramics, woodworking industries. It uses centrifugal force to remove gaseous matter.

324. Wet scrubbers are classified into ____ types.
a) 2 b) 3
c) 5 d) 6
Answer: b
Explanation: Web scrubbers are used to remove air pollutants and are classified into Spray towers, Wet cyclonic scrubber and Venturi scrubber.

326. The centrifugal collectors are classified into how many types?
a) 3 b) 4
c) 5 d) 2
Answer: d

Explanation: The Centrifugal collectors are classified into the Cyclone collector and Dynamic precipitator.

327. Which of the following air pollution control device has maximum efficiency?
a) Electrostatic precipitator b) Dynamic precipitator
c) Spray tower d) Wet cyclonic scrubber
Answer: a
Explanation: Electrostatic precipitator has the maximum efficiency among the rest with a value of 99%.

328. Which of the following fluid is used in web scrubbers?
a) Lime b) MgSO4
c) NaCl d) K2Cr2O7
Answer: a
Explanation: Apart from lime, K2CO3, a slurry of MnO and MgO and water can be used in Web scrubber.

329. 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
Answer: c
Explanation: The efficiency of Electrostatic precipitator is <99%, whereas the efficiency of Fabric filter is >99%.

340. Which of the following removes both gaseous and particulate contaminants?
a) Venturi scrubber b) Gravitational settling chamber
c) Dynamic precipitator d) Wet scrubber
Answer: a
Explanation: Venturi scrubber removes both gaseous and particulate contaminants. The minimum particle size removal is 0.5μm and its efficiency is < 99%.

341. 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
Answer: b

Explanation: Electrostatic precipitator can be operated at a high temperature between 3000C to 4500C, has a high maintenance cost, can cause a freezing problem and minimum particle size removal is < 1μm

342. Which was the first city to an established system of waste removal?
a) Lahore b) Athens
c) Paris d) London
Answer: b
Explanation: In ancient cities, food scraps and other waste were simply thrown onto the unpaved streets where they accumulated and cause various diseases. Around 320 BC in Athens, the first known law forbidding this practice was established.

343. Why burning waste is not an acceptable practice of solid waste management?
a) Because it is very costly b) Because it requires modern technologies
c) Because it cause several environmental issues
d) Because it requires lot of space
Answer: c
Explanation: Burning waste is not an acceptable practice, because if we look into environmental or health prospective burning waste creates lots of pollution and it is harmful to both environment and as well as organisms.

344. What plan should we make to the disposal of solid waste?
a) Integrated waste management plan b) Recycling of waste management plan
c) Reducing of waste management plan d) Use of waste management plan
Answer: a
Explanation: The disposal of solid waste should be part of an integrated waste management plan. This integrated solid waste management is the method of collection, processing, resource recovery and final disposal of solid waste.

345. The term ‘Municipal Solid Waste’ is used to describe which kind of solid waste?
a) Hazardous b) Toxic
c) Non hazardous d) Non toxic
Answer: a
Explanation: The term ‘municipal Solid Waste’ is generally used to describe most of the non-hazardous solid waste from a city, town or village that requires routine collection and transport to a processing or disposal site.

346. How many main components are there in integrated waste management?
a) One b) Two
c) Three d) Four

Answer: c
Explanation: An integrated waste management strategy includes three main components they are source reduction, recycling and disposal. All these three types plays an important role in the solid waste management.

347. Municipal Solid Waste (MSW) contains a wide variety of materials.
a) True
b) False
Answer: a
Explanation: MSW contains a wide variety of materials. It can contain food waste which is classified as wet garbage and paper, plastic, tetra packs, plastic cans, glass bottles, metal items, wood pieces, aluminum foil and many more items.

348. Which of the integrated waste management is reduced on an individual level?
a) Source reduction b) Recycling
c) Disposal d) Burning
Answer: a
Explanation: Source reduction is one of the fundamental ways to reduce waste. On an individual level, we can reduce the use of unnecessary items while shopping, avoid buying disposable items and avoid using plastic carry bags.

349. Which of the following can be recycled many times?
a) Plastic b) Wood
c) Organic materials d) Aluminum
Answer: d
Explanation: Recycling is reusing some components of the waste that has some economic value. Aluminum can be recycled many times. Mining of new aluminum is expensive hence recycling of aluminum plays a significant role in aluminum industry.

350. Why plastics are difficult to recycle?
a) Because it is very hard material b) Because it is very adhesive in its nature
c) Because of different types of polymer resins d) Because of different sizes of plastic
Answer: c
Explanation: Plastic are difficult to recycle because of the different types of polymer resins in their production. Since each type has a distinct chemical composition, different plastics cannot be recycled together.

351. How many key characteristics of a municipal sanitary landfill are there?
a) One b) Two
c) Three d) Four

Answer: c
Explanation: The three key characteristics of a municipal sanitary landfill that distinguish it from an open dump are: Solid waste is placed in a suitably selected and prepared landfill site, the waste material is spread out and compacted with appropriate heavy machinery, the waste is covered each day with a layer of compacted soil.

352. How does organic material in the buried solid waste will decompose?
a) By the action of oxidation b) By the action of microorganisms
c) By the flow of water d) By the soil particles
Answer: b
Explanation: The organic material in the buried solid waste will decompose due to the action of microorganisms. At first the waste decomposes aerobically until the oxygen that was present in the freshly placed fill is used up by the aerobic microorganisms.

353. What is called for the process of burning municipal solid waste in a properly designed furnace under suitable temperature and operating conditions?
a) Landfill b) Recycling
c) Vermicomposting d) Incineration
Answer: d
Explanation: Incineration is a chemical process in which the combustible portion of the waste is combined with oxygen forming carbon dioxide and water, which are released into the atmosphere. Suitable temperature and operating conditions are required to achieve for incineration.

354. Why the recycled paper is banned for use in food containers?
a) Because it creates contamination b) Because it creates a lot of spaces
c) Because paper can be used only one time
d) Because paper is very thick and can’t cover the food containers
Answer: a
Explanation: Recycled paper is banned for use in food containers to prevent the possibility of contamination. It very often costs less to transport raw-paper pulp than scrap paper. Collection, sorting and transport account for about 90% of the cost of paper recycling.

355. Land filling is an economic alternative for solid waste disposal and it can be implemented easily.
a) True
b) False
Answer: a

Explanation: Although land filling is an economic alternative for solid waste disposal, it becomes increasingly difficult to find suitable landfilling sites within economic hauling distance. There will be a danger of some environmental damage in the form of leakage of leachate.

356. The process of burning of municipal solid waste at high temperature is called _____

a) Incineration b) Composting
c) Land filing d) Shredding
Answer: a
Explanation: Incineration is the most sanitary method of disposal of municipal solid waste. Solid waste should have a high calorific value.

357. Which of the following is a biodegradable waste?
a) Polythene bags b) Synthetic fiber
c) Food waste d) Paper
Answer: c
Explanation: Polythene bags, synthetic fiber and paper are non biodegradable wastes whereas food waste is a biodegradable waste.

358. In which method of disposal of municipal solid waste, the waste is dumped in the soil?
a) Incineration b) Composting
c) Land filing d) Shredding
Answer: c
Explanation: Land filling is a process of disposal of solid waste under the soil. It is usually done in low lying areas to prevent unhygienic conditions.

359. Which of the following is correct regarding disposal of waste by land filling?
a) Economical method b) Preferred in low lying areas
c) Foul gases are not produced d) Separation of different types of waste not required
Answer: c
Explanation: Land fill gases are produced during the dumping of waste. They are foul smell creating unhygienic conditions.

360. The density of ash produced in the municipal solid waste is _____
a) 100 kg/m3 b) 450 kg/m3
c) 700 kg/m3 d) 1000 kg/m3
Answer: c
Explanation: The range of the d density of ash produced from the municipal solid waste is 700-850kg/m3.

361. The process of decomposition of biodegradable solid waste by earthworms is called _____

a) Land fills b) Shredding
c) Vermi-composting d) Composting
Answer: c
Explanation: The process of decomposition of biodegradable solid waste by earthworms is called Vermi-composting.

362. The waste produced in cotton mills are _____

a) Municipal solid waste b) Non biodegradable waste
c) Hazardous waste d) Non hazardous waste
Answer: d
Explanation: The industrial waste is produced by cotton mills which are biodegradable and are non hazardous.

363. Which of the following is not the land filling method?

a) Bangalore method b) Area method
c) Depression method d) Trench method
Answer: a
Explanation: Bangalore method is a method of composting whereas area, depression and trench method are the land filling method.

364. _____ is a liquid that passes through solid waste and extracts suspended impurities from it.

a) Leachate b) Sludge
c) Distilled water d) Municipal waste
Answer: a
Explanation: Leachate is a liquid that passes through solid waste and extracts suspended impurities from it. It can be minimized by the use of clay lines.

365. Which of the following is not the municipal solid waste?

a) Radioactive substance b) Ashes
c) Food waste d) Rubbish
Answer: a
Explanation: Rubbish, food waste and food waste are municipal solid waste, whereas radioactive substances are industrial waste.

366. Which of the following waste can be decomposed by bacteria?

a) Radioactive substance b) Ashes
c) Food waste d) Rubbish
Answer: c

Explanation: Food waste can be decomposed by bacteria as they are biodegradable waste, whereas ashes, rubbish is non biodegradable.

367. _____ is the cutting and tearing of municipal solid waste.
a) Land fills b) Shredding
c) Pulverization d) Composting
Answer: b
Explanation: Shredding is the cutting and tearing of municipal solid waste. It helps in reducing the size and volume of municipal solid waste.

368. _____ is the crushing and grinding of municipal solid waste.
a) Land fills b) Shredding
c) Pulverization d) Composting
Answer: c
Explanation: Pulverization is the crushing and grinding of municipal solid waste. It changes the character of municipal solid waste and reduced its volume by 40%.

369. In which method of composting, decomposition of anaerobic waste takes place?
a) Indian method b) Depression method
c) Bangalore method d) Trench method
Answer: c
Explanation: In the Bangalore method of composting, decomposition of anaerobic waste takes place. It is better than the Indore method.

370. Which of the following is a biological method of disposal of municipal solid waste?
a) Land fills b) Shredding
c) Pulverization d) Composting
Answer: d
Explanation: Composting is a biological method of decomposing the municipal solid waste under aerobic and anaerobic condition. It results in the production of humus.

371. The different ways a person can come into contact with hazardous chemicals are called _____
a) Exposure pathways b) Toxic pathways
c) Chemical pathways d) Hazard pathways
Answer: a
Explanation: There are three basic exposure pathways which are inhalation, ingestion, and skin contact. Inhalation is breathing or inhaling into the lungs. Ingestion is taking something in by mouth. Skin contact occurs when something comes in direct contact with skin.

372. Ingestion can be called secondary exposure pathway after skin contact happens.
a) False
b) True
Answer: b
Explanation: Ingestion can be a secondary exposure pathway after skin contact happens only if the exposed person put his hands in his mouth and transfer the chemical from his hands to his mouth.

373. Minamata, Japan hazard outbreak had _____ effect on the population.
a) Direct b) Acute
c) Minimal d) Chronic
Answer: d
Explanation: Hazard outbreak in Minamata, Japan in 1956 caused due to consumption of Methylmercury in fish. It lead to neurological disease which is popularly known as Minamata disease.

374. Exposure to _____ caused environmental hazard in USA in the year 1985.
a) Methylisocyanate b) Lead in paint
c) Carbamate pesticide d) Lead
Answer: c
Explanation: Consumption of watermelons which had been sprayed with carbamate pesticide in California, in the year 1985 lead to environmental outbreak. It effected gastrointestinal, skeletal, muscle, autonomic and central nervous system.

375. Which of the following chemical is responsible for London smog episode?
a) Sulphur dioxide b) Sulphur
c) Sulphur trioxide d) Sulphur oxide
Answer: a
Explanation: Severe air-pollution with sulphur dioxide and suspended particulate matter (SPM) caused London smog episode in 1952. Increase in heart and lung disease manifestations was reported.

376. Environmental disease outbreak in Toyama, Japan was due to _____
a) Lead b) Cadmium
c) Mercury d) Zinc
Answer: b
Explanation: Cadmium in rice caused kidney and bone disease to wide population in Toyama, Japan in 1950s.

377. Which of the following chemical is responsible for acute lung disease from Bhopal gas tragedy?
a) Methylisocyanate b) Methylisocyanade
c) Methyl d) Methylcyanate
Answer: a
Explanation: The Bhopal gas tragedy was an industrial accident which happened at a pesticide plant in the city of Bhopal, India. In 1984, the plant released tonnes of toxic methylisocyanate (MIC) gas, exposing wide range of population to toxic gases.

378. Heavy metals like Arsenic, Cadmium and Cyanide effects _____
a) Immune system b) Nervous system
c) Skin d) Respiratory system
Answer: b
Explanation: Arsenic from pressure treated wood, cadmium from discarded batteries, carbon monoxide from car exhaust, and cyanide from rat poison causes effect on nervous system.

379. Acute effects may take years to show up.
a) True
b) False
Answer: b
Explanation: Acute effects show up immediately or soon after exposure to the chemical. It may be minor, like nose or throat irritation, or could be serious, like eye damage whereas chronic (long-term) effects may take years to show up and these effects are permanent.

380. What is chronic toxicity?
a) Effects due to long term exposure b) Effects due to short term exposure
c) Effects due to exposure d) Benefits due to exposure
Answer: a
Explanation: Hazardous substances produce toxic effects in humans or the environment after prolonged exposure to the substance, which is called chronic toxicity.

381. What is acute toxicity?
a) Effects due to long term exposure b) Effects due to short term exposure
c) Effects due to exposure d) Benefits due to exposure
Answer: b
Explanation: Some hazardous substances produce toxic effects in humans or the environment after a single, episodic release. These toxic effects are referred to as acute toxicity

382. What is the iron and steel constitute of e-waste?
a) 20 b) 30
c) 40 d) 50
Answer: d
Explanation: E-waste consists of iron and steel constitute about 50%, followed by plastics (21%), non-ferrous metals (13%) and other constituents.

383. Which of the following element make e-waste hazardous in nature?
a) Lead b) Glass
c) Plastic d) Iron
Answer: a
Explanation: The presence of elements like lead, mercury, arsenic, cadmium, selenium, hexavalent chromium, and flame retardants beyond threshold quantities make e-waste hazardous in nature.

384. In 2006, the IAER projected that _____ electronic and electrical appliances would become e-waste by 2010.
a) 1 billion b) 2 billion
c) 3 billion d) 4 billion
Answer: c
Explanation: In 2006, the International Association of Electronics Recyclers (IAER) projected that 3 billion electronic and electrical appliances would become WEEE or e-waste by 2010.

385. According to the Comptroller and Auditor- General's (CAG) report what is the amount of e-waste generated annually?
a) 4LT b) 5LT
c) 6LT d) 7LT
Answer: a
Explanation: According to CAG report over 4 lakh tonnes of electronic waste, 1.5 MT of plastic waste, 1.7 MT of medical waste, 48 MT of municipal waste are generated in the country annually.

386. What is the hazardous pollutant released from LED's?
a) Arsenic b) Barium
c) Cobalt d) Cadmium
Answer: a
Explanation: Semiconductors, diodes, microwaves, LED's (Light-emitting diodes), solar cells releases arsenic into the environment.

387. What is the hazardous pollutant released from electron tubes?

a) Arsenic b) Barium
c) Cobalt d) Cadmium
Answer: b
Explanation: Electron tubes, filler for plastic and rubber, lubricant additives releases barium into the environment.

388. What is the hazardous pollutant released from batteries?
a) Arsenic b) Barium
c) Cobalt d) Cadmium
Answer: d
Explanation: Batteries, pigments, solder, alloys, circuit boards, computer batteries, monitor cathode ray tubes (CRT) releases cadmium when handled improperly.

390. Insulators release chrome.
a) True
b) False
Answer: b
Explanation: Chrome is released by dyes or pigments, switches, solar panels whereas, insulators release cobalt.

391. What is the hazardous pollutant released from inductive coils?
a) Arsenic b) Barium
c) Cobalt d) Copper
Answer: d
Explanation: Conductor in cables, copper ribbons, coils, circuitry, and pigments releases copper pollutant into environment.

392. What is the hazardous pollutant released from circuit boards?
a) Arsenic b) Barium
c) Lead d) Copper
Answer: c
Explanation: Lead rechargeable batteries, solar, transistors, lithium batteries, PVC, (polyvinyl chloride) stabilizers, lasers, LED's, thermoelectric elements, and circuit boards releases lead pollutant into environment.

393. What is the hazardous pollutant released from telephones?
a) Lithium b) Barium
c) Lead d) Copper
Answer: a

Explanation: Mobile telephones, photographic equipment, video equipment (batteries) releases lithium pollutant into environment.

394. What is the hazardous pollutant released from calculators?
a) Lithium b) Mercury
c) Lead d) Copper
Answer: b
Explanation: Components in copper machines and steam irons; batteries in clocks and pocket calculators, switches, LCDs release mercury into environment when improperly handled.

395. Nickel is released from _____
a) Display b) Calculator
c) Alloy d) Transformers
Answer: c
Explanation: Nickel is released into environment from alloys, batteries, relays, semiconductors, and pigments.

396. Which of the hazardous pollutant occurs in plastic?
a) Lithium b) PCBs
c) Lead d) Copper
Answer: b
Explanation: Transformers, capacitors, softening agents for paint, glue, and plastic contains PCBs (polychlorinated biphenyls).

Module -4

397. Which of the following doesn't control aquifer behaviour?
a) Wind conditions b) Nature of the rock
c) Structural disposition d) Climate conditions like precipitation
Answer: a
Explanation: As a storage reservoir, the aquifer behaviour is controlled by- the nature of the rock and its porosity, structural disposition, with regard to the recharge points or places, climate conditions like annual precipitation.

398. An aquifer can hold water _____ and the state of water is _____
a) Permanently – State of flow b) Temporarily – State of flow
c) Permanent – State of stagnancy d) Temporary – State of stagnancy
Answer: b

Explanation: It must be remembered that an aquifer can hold water only temporarily, as the water is always in a state of flow in it. However, the rate of flow of water through an aquifer is very slow compared to surface waters.

399. The quantity of water that can be withdrawn annually and also the rate at which this withdrawal could be made without adversely affecting the inventory of the aquifer is called _____

a) Annual yield b) Percent yield
c) Operational yield d) Monthly yield
Answer: c
Explanation: The quantity of water that can be withdrawn annually and also the rate at which the withdrawal could be made without adversely affecting the inventory of the aquifer, therefore, determine what may be called operational yield.

400. When an aquifer is used to artificially recharge by making it pass through an intervening layer, the aquifer acts as _____

a) A cooling agent b) An aerating agent
c) An odour agent d) A filter plant

Answer: d
Explanation: An aquifer may be made to serve as a filter plant when artificial recharge is made to pass through an intervening layer of rock, which acts as a natural filter

401. When would the dam become irrelevant?
a) When the rocks are strong b) When the rocks are impermeable
c) When the rocks are porous d) When the rocks are weathered to a certain extent
Answer: c
Explanation: A dam is built across a river primarily to store water in the form of a reservoir. The whole idea of a dam would become irrelevant if the foundations on which it is built are made of porous rocks or if a stretch of a reservoir rock is permeable.

402. Which quality of rock should be known properly for the foundations of dams, reservoirs, etc.?
a) Colour knowledge b) Geological
c) Hydrogeological d) History of the formation of rocks
Answer: c
Explanation: The position of the water table and hydrogeological qualities of rocks forming foundations and abutments of dams and reservoirs must be known.

403 Groundwater is a source of trouble at which place?
a) Plains b) Slopes
c) Rivers d) Lakes
Answer: b
Explanation: Groundwater is a major source of trouble for the stability of slopes. Many slope failures, especially in hilly regions are due to direct or indirect involvement of groundwater.

404. An associated protection of rising water-table is the development of _____
a) Loss of nutrients b) Loss of good quality of water
c) Salinity of water d) Increase in turbidity
Answer: c
Explanation: An associated trouble with rising water-table is the development of salinity of the soils. The rising groundwater may be rich in some undesirable salts that are left at or near the surface during its loss to atmosphere due to evaporation.

405. The root system of crops in water-logged areas get _____
a) Decomposed b) Enriched with nutrients
c) Photosynthesised d) Growth inhibited
Answer: a
Explanation: The root system of crops in water-logged areas gets decomposed. Large areas of land in Indian subcontinent are affected by water-logging.

406. The lubricating action of water is a positive action for slope rocks.
a) True b) False
Answer: b
Explanation: Soil creep and solifluction are caused mainly due to groundwater. The lubricating action of water besides its negative effect on the strength parameters of rocks is the major cause in initiating massive landslides

407. Which one of the following is an important heat trapping gas?
a) Nitrogen b) Carbon monoxide
c) Carbon dioxide d) Hydrogen
Answer: c
Explanation: Carbon dioxide is an important heat trapping gas. It is released through human activities such as deforestation and burning fossil fuels, as well as natural processes such as volcanic eruptions and respiration.

408. How many cubic kilometers of land ice decrease in Antarctica since 2002?
a) 100 b) 400
c) 500 d) 1000

Answer: a
Explanation: Decrease in land ice is one of the effects of climate change. The continent Antarctica has been losing more than 100 cubic kilometers of ice per year since the year 2002. These decreases in land ice result in the increase of sea level.

409. Which one of the following is the reason for a sea level rise?
a) Depression of sea water b) Expansion of sea water
c) Due to heavy rainfall d) Due to low rainfall
Answer: b
Explanation: Sea level rise is caused by the expansion of sea water. Sea water as it warms up due to sunlight it response to climate change and the widespread melting of land ice. Sea level rise consumes the coastal lands and islands.

410. What is the full form of IPCC?
a) Intergovernmental Panel on Climate Change b) International Panel on Climate Change
c) Intergovernmental Protocols on Climate Change
d) International Panel on Climate Conservation
Answer: a
Explanation: IPCC stands for Intergovernmental Panel on Climate Change. It reviewed the results of several experiments in order to estimate changes in climate in the course of this century. These studies shown that, the mean average temperature will rise by 1.4 to 5.8 degree Celsius.

411. What is the estimation range of the global mean sea level rise by the year 2100?
a) 0-10 cm b) 4-45 cm
c) 9-88 cm d) 14-123 cm
Answer: c
Explanation: The global mean sea level is projected to rise by 9-88 cm by the year 2100. This cause various problems to humans as more than half of the world's population now lives within 60 km of the sea.
412. Human society can sustain any kind of climate change.
a) True
b) False
Answer: b
Explanation: Human societies will be seriously affected by extremes in climate. Some of the climatic extremes which lead to droughts and floods will cause great damage to human society. This is also a fundamental concern for human health.

413. According to the World Health Organization estimation in 2001, which one of the following is the most vulnerable region for a rise in sea level?

a) Srilanka b) Andaman and Nicobar
c) Ganges–Brahmaputra delta d) Kutch

414. Which one of the following is a result of climate change?
a) Adequate rainfall b) Pure air
c) Deficiency of freshwater d) Less soil pollution
Answer: c
Explanation: Freshwater supplies may be seriously affected due to climate change. Reducing the availability of clean water for drinking leads to the death of humans and as well as animals. It leads to drought condition.

415. How food production reduced due to climate change?
a) Due to application of organic manures b) Due to modern technologies
c) Due to increase in pests d) Due to reduced in pollution
Answer: c
Explanation: Food production will be seriously reduced in vulnerable regions directly and also indirectly through an increase in pests and plant or animal diseases. This leads to reduce in the yield of crops and the quality of the crops also reduced.

416. How climate change leads to conflicts in vulnerable regions?
a) By shortage of human resources b) By shortage of food and water
c) By shortage of land d) By shortage of chemical manures
Answer: b
Explanation: Food and water shortages may lead to conflicts in vulnerable regions. Due to shortage of food and water both animals and humans suffer from starvation and malnutrition with long term health consequences.

417. What happens when seasonal transmission of vector species due to climate change?
a) Increase the spread of diseases b) Decreased the spread of diseases
c) Vector species itself die d) Vector species do not spread disease
Answer: a
Explanation: Due to change in climate vector species like mosquitoes, will increase the spread of diseases, such as malaria, dengue etc to new areas which lack good public health infrastructure and cause problems.

418. Which one of the following can achieve Global Climate Change?
a) World War-3 b) Making unwanted policies
c) Drinking less water than required d) The training of researchers and health professionals
Answer: d

Explanation: The training of researchers and health professionals is essential towards the world becoming more responsible for the expected outcome of Global Climate Change. Thus we can protect the environment.

419. In which year the Pacific Ocean led to the most serious death in coral ever known?
a) 1993 b) 1995
c) 1997 d) 2000
Answer: c
Explanation: In 1997, the severity of periodic warming in the Pacific Ocean led to the most serious death in coral ever known. It is estimated that about 10% of the earth's coral reefs were dead and another 30% were seriously affected.

420. World Health Organization warned that climate change may have a serious affect on human health.
a) True
b) False
Answer: a
Explanation: World Health Organization set up a task group which warned that climate change may have a serious effect on human health. Climate change will increase existing health problems and may also bring new health problems.

421. What would have been the average temperature of Earth without greenhouse gases?
a) 0oC b) -7oC
c) -9oC d) -19oC
Answer: d
Explanation: Without greenhouse gases, the Earth's average temperature (currently about 14oC), would have been 33oC less.

422. Ever since the industrial revolution, by how much has the average temperature of the Earth increased?
a) 0.24oC b) 0.6oC
c) 1.2oC d) 1.8oC
Answer: b
Explanation: Since the industrial revolution, the average temperature of earth has increased by 0.6oC due to consumption of fossil fuels.

423. How much of the sun's radiation energy is absorbed by the greenhouse gases to warm the planet?
a) 75PW b) 1750GW
c) 1500MW d) 150TW

Answer: a
Explanation: The greenhouses gases, mainly carbon dioxide and water vapour absorb nearly 75 peta-watts of the infrared radiations from the sun.

424. What is the emissivity of the Earth's surface?
a) 0.457 b) 0.578
c) 0.135 d) 1.42
Answer: a
Explanation: Earth has an emissivity of 0.457.

425. The Earth is still said to be in the "ice age" period.
a) True
b) False
Answer: a
Explanation: As per definition, ice age refers to the period when there are large ice sheets in both the hemispheres. Antarctica, Greenland and Arctic ice sheets are the reason we are still in Holocene of the ice age.

426. In which layer of the ionosphere does the International Space Station orbit?
a) D b) E
c) F d) G
Answer: c
Explanation: The F-layer of the ionosphere has enough atmospheric resistance for the orbiting of International Space station and space shuttle.

427. Which type of clouds is found in the highest altitude of the Earth's atmosphere?
a) Noctilucent b) Cirrostratus
c) Stratus d) Cirrus
Answer: a
Explanation: The noctilucent clouds or night clouds are found in the mesosphere at an altitude of approximately 80km.

428. What is the significance of the ionosphere?
a) Aviation movements b) High frequency radio transmission
c) Regulates weather d) All of the mentioned
Answer: b
Explanation: Ionosphere contains ionized atmospheric particles due to solar radiation and is useful in the propagation of radio waves.

429. Troposphere contains nearly 80% of the atmosphere by mass.

a) True
b) False
Answer: a
Explanation: Tropospheric layer extends up to 17km in altitude at the equator and is known to contain 80% of the mass of the atmosphere.

430. What does the term “overcast” define?
a) Phenomenon of indirect radiation exposure due to scattering
b) Weather when cloud cover is equal to 8 oktas
c) Phenomenon of indirect radiation exposure due to scattering & Weather when cloud cover is equal to 8 oktas
d) None of the mentioned
Answer: c
Explanation: Overcast is a phenomenon where cloud cover is equal to 8 oktas (unit of measurement) and shadow cannot be seen due to indirect radiation caused by scattering.

431. Twinkling of stars is otherwise known as scintillation.
a) True
b) False
Answer: a
Explanation: Scintillation or twinkling is the effect of apparent position or brightness of a distant light emitting body (like stars), observed through various layers of the atmosphere.

432. What does ITCZ stand for corresponding to global wind patterns?
a) Inner Tropospheric Convergence Zone b) Inter Tropical Convergence Zone
c) Inner Tropical Continental Zone d) Inter Tropical Continental Zone
Answer: b
Explanation: Inter Tropical Convergence Zone is the region around the equator where southeast and northeast trade winds meet.

433. Which one of the following cause acid rain?
a) Water pollution b) Soil pollution
c) Air pollution d) Noise Pollution
Answer: c
Explanation: Acid rain is mainly caused due to a result of air pollution. When any type of fuel is burnt, lots of different chemicals are produced. Some of the gases react with tiny droplets of water. This rain from clouds forms acid rain.

434. What are two acids formed when gases react with the tiny droplets of water in clouds?
a) Sulphuric acids and nitric acid b) Hydrochloric acid and nitric acid

c) Sulfurous acid and acetylsalicylic acid d) Sulphuric acid and hydrochloric acid
Answer: a
Explanation: The gases of nitrogen oxides and sulphur dioxide react with the tiny droplets of water in clouds to form sulphuric and nitric acid. The rain from these clouds falls as very weak acid known as 'Acid rain'.

435. What is the nature of acid rain?
a) Withstanding b) Protecting
c) Corrosive d) Balancing
Answer: c
Explanation: The nature of acid rain is corrosive. This corrosive nature of acid rain produces many forms of environmental damages. It affects rivers, vegetation, soil and organisms. Acid rain is known to cause widespread environmental damage.

436. Which of the following way acid rain affects the plants?
a) By nourishing the nutrients from the soil
b) By increasing the nutrients from the soil
c) By removing nutrients from the soil
d) By balancing the nutrients in the soil
Answer: c
Explanation: Acid rain indirectly affects plants by removing nutrients from the soil during which they grow. Acid rain dissolves and washes away all the vitamins in the soil which are very much essential for plants.

437. What is the result of acid rain when it falls into water bodies?
a) The water becomes acidic b) The water becomes pure
c) The water increase its nutrients value d) The water increase its level
Answer: a
Explanation: When acid rain that falls or flows as water to reach rivers, lakes, wetlands and other water bodies causes the water in them to become acidic. This affects plant and animal life in aquatic ecosystems.

438. Which one of the way can prevent acid rain?
a) Increase the emission of sulfur dioxide and nitrogen oxides
b) Decrease the emission of sulfur dioxide and nitrogen oxides
c) Increase in the emission of hydrochloride and phosphate
d) Decrease in the emission of hydrochloride and phosphate
Answer: b

Explanation: One of the ways to stop the formation of acid rain is to decrease the emission of sulfur dioxide and nitrogen oxides into the surroundings. This may be achieved by using much less energy from fossil fuels in power plants and in industries.

439. The Taj Mahal in India is affected by_____
a) Fog b) Acid rain
c) Water pollution d) Spoil Pollution
Answer: b
Explanation: Acid rain and dry acid deposition damage buildings. The acid corrodes the materials causing extensive damage and ruins historic buildings. For instances the Tai Mahal in India have been affected by acid rain.

440. Which of the following is the best way to reduce acid rain in soil?
a) By adding sulphur to the soil b) By adding nitrogen to the soil
c) By adding oxygen to the soil d) By adding limestone to the soil
Answer: d
Explanation: When acid rain affects the soil it's difficult to prevent soil from acid rain but powered limestone can be added to the soil by a process which is known as liming to neutralize the acidity of the soil.

441. How can we control acid rain which is causing due to the exhaust fumes on the atmosphere by cars?
a) By burning more fuels b) By using old engine vehicles
c) By using ignition d) By using catalytic converters
Answer: d
Explanation: In catalytic converters, the gases are passed over metal coated beds that convert harmful chemicals into less harmful ones. These are used in cars to reduce the effects of exhaust fumes on the atmosphere.

442. Which is the most acidic in pH scale?
a) 0 b) 7
c) 10 d) 14
Answer: a
Explanation: Acidity is measured using a scale called the pH scale. This scale goes from 0 to 14. 0 is the most acidic and 14 is the most alkaline. Acid rain is much weaker than the string acids, it's never acidic enough to burn the skin.

443. Who was the first to use the phrase "Acid Rain"?
a) Robert Angus Smith b) Ernest Flower
c) Elmer Joseph Clark d) Christ Ralph

Answer: a
Explanation: The phrase acid rain was first used in 1852 by Robert Angus Smith, who was a Scottish chemist. In his investigation of rainwater chemistry near industrial cities in England and Scotland he termed the phrase acid rain for the very first time.

444. When was the "Clean Air Act" in United States came into force?
a) 1950 b) 1960
c) 1970 d) 1980
Answer: c
Explanation: In the United States, reduction in acid deposition stem for the Clean Air Act of 1970 and its Amendments in 1990. This Amendments begun by the regulating of coal fired power plant emission. This development significantly reduced the Sulphuric dioxide in United States.

445. Natural sources also cause acid rain.
a) True
b) False
Answer: a
Explanation: The major natural causing agent for acid rain is volcanic emission. Volcanoes emit acid producing gases to create higher than normal amounts of acid rain or any other form of precipitation such as fog and snow

446. Below which of the following pH is rain regarded as 'acid rain'?
a) 7 b) 7.3
c) 5.6 d) 6
Answer: c
Explanation: Though the pH of neutral water is 7, rain water is acidic due to mixing up with atmospheric carbon dioxide and is said to have a 5.6 pH. Hence acid rain has a pH less than 5.6.

447. Glass containers are generally not preferred for sampling rain water. Why?
a) Glass containers are expensive b) Glass containers are not easy to maintain
c) Glass containers affect the pH of the rain water
d) All of the mentioned
Answer: c
Explanation: Glass containers can alter the pH of the rain water and hence not suitable to use for sampling rain water.

448. Which of the following gases are main contributors to acid rain?
a) Carbon dioxide and carbon monoxide
b) Sulphur dioxide and carbon dioxide

c) Sulphur dioxide and nitrogen dioxide
d) Sulphur dioxide and nitrous oxide
Answer: d
Explanation: Sulphur dioxide and nitrogen dioxide have a high tendency to mix with water to form sulphurous/sulphuric acid and nitric acid.

449. What does the term “liming” mean?
a) Application of magnesium and calcium rich substances to soil
b) Erosion of calcium carbonate(lime) zones in soil
c) Excessive growth of lemon trees in acid rain prone regions
d) None of the mentioned
Answer: a
Explanation: Liming is done to neutralise soils that become acidic due to excessive acidic rainfall, but is known to have harmful impact on plant life.

450. Which place in India receives the highest annual rainfall?
a) Mawsynram b) Cherrapunji
c) Siju d) Phyllut
Answer: a
Explanation: Mawsynram currently holds the record for the highest annual rainfall (11.873 km) in our country.

451. Who discovered the phenomenon of acid rain?
a) George Brown b) James T. Stewart
c) Robert Angus Smith d) Charles David
Answer: c
Explanation: The phenomenon of acid rain was discovered by Robert A. Smith during the industrial revolution.

452. Which of the following is/are natural contributor(s) to sulphur dioxide in the atmosphere?
a) Sea sprays b) Volcanic eruption
c) Decaying vegetation d) All of the mentioned
Answer: d
Explanation: Though primary natural contributor to sulphur dioxide is volcanic eruptions, even sea sprays and decaying vegetation release sulphur dioxide to the atmosphere.

453. What is the pH required for the survival of aquatic animals and plants?
a) 7 b) 7.5
c) 6.5 d) 4.8
Answer: d

Explanation: Aquatic organisms require a moderately acidic pH of 4.8 and if it goes below this level, it proves to be detrimental to their survival.

454. The acidic air pollutants reach the Earth's surface because of wet deposition only.
a) True
b) False
Answer: b
Explanation: The acidic air pollutions get deposited on the Earth's surface due to both wet and dry deposition. Wet deposition occurs due to rain fall and moist weather, whereas dry deposition occurs due to mixing of acidic pollutants and dust.

455. Which of the following gases is responsible for the yellowing of the Taj Mahal?
a) Organic carbon b) Black carbon
c) Brown carbon d) All of the mentioned
Answer: d
Explanation: Organic carbon, black carbon and brown carbon (generated due to biomass combustion) are light absorbing particles responsible for the yellowing of the Taj Mahal.

456. What is the average concentration of ozone in the ozone layer of the atmosphere?
a) Nearly 100% b) Greater than 90%
c) Between 10-50% d) Less than 10ppm
Answer: d
Explanation: The concentration of ozone is about 10 ppm in the ozone layer and only 0.3 ppm in the entire atmosphere.

457. Who discovered the ozone layer?
a) Henri Buisson & Charles Fabry
b) Carl Sagan & Charles Fabry
c) G.M.B Dobson
d) Carl Sagan &G.M.B Dobson
Answer: a
Explanation: In 1913, Henri Buisson and Charles Fabry discovered the ozone layer and later its properties were studied by G.M.B. Dobson.

458. Which of the following devices can be used to measure ozone in the stratosphere from the ground?
a) Spectrometer
b) Photometer
c) Spectrophotometer
d) Spectro-ozonometer

Answer: c
Explanation: The spectrophotometer developed by Dobson can be used to measure ozone in the stratosphere from the ground. The amount of ozone is measured in terms of – Dobson unit.

459. The ozone layer absorbs what range of wavelengths of the sun's radiation?
a) 0.80 nm – 1.50 nm b) 200 nm – 315 nm
c) 450 nm – 570 nm d) 600 nm – 750 nm
Answer: b
Explanation: The ozone layer absorbs the medium frequency UV radiations from the sun and hence protects the life forms at the surface from harm.

460. Who discovered the formation of ozone from photochemical reactions?
a) G.M.B Dobson b) Sydney Chapman
c) Carl Sagan d) Henri Buisson
Answer: a
Explanation: Sydney Chapman was the physicist who discovered that stratospheric ozone if formed when the UV rays from the sun splits oxygen molecules, and the nascent oxygen combines with existing molecules to form ozone.

461. Between what altitudes, is the ozone layer found in highest concentrations?
a) 10-20km b) 20-40km
c) 40-55km d) 55-70km
Answer: b
Explanation: The ozone layer is found in high concentrations of 2-8ppm at an altitude of 20-40km.

462. Nitrogen also helps in preventing UV rays from reaching the Earth.
a) True
b) False
Answer: a
Explanation: Nitrogen prevents extremely short wavelengths or vacuum UV radiations (10-100nm) from reaching the surface.

463. Which of the following UV radiations is responsible for causing sun burns and skin cancer?
a) UV-A b) UV-B
c) UV-C d) All of the mentioned
Answer: b
Explanation: UV-B radiations of 315-280nm is responsible for causing sunburns, genetic damage as well as skin cancer.

464. The long UV-B radiations are important for vitamin D production of the skin.
a) True
b) False
Answer: a
Explanation: The longest of the UV-B radiations reach the surface of the earth is small fractions and aids in vitamin D production of the skin.

465. In which season is the ozone found at its maximum level in the northern hemisphere?
a) Winter b) Summer
c) Spring d) Autumn
Answer: c
Explanation: The ozone levels in the northern hemisphere are at maximum during the spring season.

466. When was the ozone hole discovered?
a) 1974 b) 1964
c) 1994 d) 1984
Answer: d
Explanation: The ozone hole was discovered in the year 1984 by Jonathan Franklin, Joseph Farman and Brian Gardiner.

467. The ozone hole is a phenomenon that has occurred in:
a) Arctic region b) Northern temperate region
c) Southern temperate region d) None of the mentioned
Answer: d
Explanation: The phenomenon of the ozone hole occurred in the Antarctic region primarily due to catalytic breakdown of ozone molecules by halogenated compounds.

468. Which of the following chemicals are responsible for the depletion of the stratospheric ozone layer?
a) Refrigerants b) Propellants
c) Foam-blowing agents d) All of the mentioned
Answer: d
Explanation: Refrigerants containing halocarbons, foam-blowing agents such as HFCs, halons, CFCs and freons as well as propellants containing halogenated compounds are responsible for depleting the ozone layer.

469. What does EESC stand for in context of ozone depleting compounds?
a) Equivalent Effective Stratospheric Chlorine
b) Equivalent Effective Stratospheric Chlorofluorocarbons

c) Equivalent Energy Saving Compounds
d) Energy Effective Stratospheric Compounds
Answer: a
Explanation: EESC stands for equivalent effective stratospheric chlorine is used to measure the chlorine equivalent of halogens that can deplete the ozone layer.

470. The Montreal Protocol bans the production of which of the following chemical substances?
a) Chlorine, bromine, CFCs, freons
b) Carbon tetrachloride, halons, trichloroethane, CFCs
c) CFCs, bromine, halons, freons
d) CFCs, halons, freons
Answer: b
Explanation: The Montreal protocol bans the production of halons, trichloroethane, CFCs and carbon tetrachloride

471. Eco-toxicology is the study of _____
a) Chemical interactions of organism and environment
b) Physical interactions of organism and environment
c) Thermal interactions of organism and environment
d) Biological interactions of organism and environment
Answer: a
Explanation: Eco-toxicology deals with how chemicals interact with organisms as well as the environment and their impacts.

472. Hazard estimation in ecotoxicology is done based on _____
a) Accumulation
b) Bio-accumulation
c) SARA
d) HWL
Answer: b
Explanation: Hazard estimation and estimation in ecotoxicology is done based on the concentration of bio-accumulation of a chemical in food chain.

473. Eco-toxicology is based on _____ of chemicals.
a) Chemical b) Physical
c) Toxicological d) Biological
Answer: c
Explanation: Eco-toxicology is based on toxicological characteristics of chemicals and their susceptibility in the environment.

474. Acute aquatic toxicity is measured in _____
a) EC b) AS
c) PS d) CB
Answer: a
Explanation: Acute aquatic toxicity is measured with respect to the concentration of effected organism i.e. EC50 or survive treatment LD50.

475. Chronic toxicity is based on _____
a) NOEC b) AOEC
c) SOEC d) QEOC
Answer: a
Explanation: Chronic toxicity is based on no observed effect concentration (NOEC) or lowest observed effect concentration (LOEC) of an event.

476. According to TURI which tool is used for determining aquatic toxicity?
a) P2SD b) P3SFD
c) P2OASys d) P20FR
Answer: c
Explanation: The Toxics Use Reduction Institute (TURI) framework suggests Pollution Prevention Options Assessment System (P2OASys) tool for aquatic toxicity.

477. Toxicity ranking from ToxPi is based on _____
a) Suborganismal tests b) Organismal test
c) P2SO d) EC100
Answer: a
Explanation: Toxicity ranking from ToxPi is based on suborganismal tests for which the data have been collected for each chemical under consideration.

478. _____ models provide ecotoxicity endpoint.
a) QASR b) QSAR
c) QAWS d) QSEA
Answer: b
Explanation: Quantitative Structure Activity Relationships models estimates various ecotoxicity end points on the basis of chemical structure.

479. _____ species is used as screening of chemicals.
a) Eisinia foetida b) Folsomia candida
c) Enchytraeus albidus d) Zebrafish
Answer: d

Explanation: The zebrafish which is known as Danio rerio is used in high throughput screening for chemicals.

480. The fluoride concentration for prevention of dental caries is _____
a) 1mg/l b) 2mg/l
c) 3mg/l d) 4mg/l
Answer: a
Explanation: Dental caries occurs in children. It can be prevented when the concentration of fluoride in water is between 0.7 to 1.2mg/l.

481. In which process, the fluoride content of water is raised?
a) Chlorination b) Fluoridation
c) Defluoridation d) Flocculation
Answer: b
Explanation: When the fluoride content is low, it will cause dental caries. So the fluoride content of water is raised and the process is called fluoridation.

482. Which of the following is not used as a fluoride compound?
a) Sodium fluoride b) Sodium silico fluoride
c) Hydrofluosilicic acid d) Sodium fluro carbonate
Answer: d
Explanation: Sodium fluoride, sodium silico fluoride, hydrofluosilicic acid and sodium fluro carbonate are the fluoride compounds used for fluoridation.

483. Which of the following is the pure compound?
a) Sodium fluoride b) Sodium silico fluoride
c) Hydrofluosilicic acid d) Sodium fluro carbonate
Answer: a
Explanation: Sodium fluoride is the most purest compound having 95-98% purity due to which, they are commonly used for fluoridation.

484. As far as safer handling is considered, which of the following is used for fluoridation?
a) Sodium fluoride b) Sodium silico fluoride
c) Hydrofluosilicic acid d) Sodium fluro carbonate
Answer: c
Explanation: For safer handling, hydrofluosilicic acid is preferred as even if it is spilled on the skin, it can be removed easily by washing in cold water.

485. Fluorides in solution form are preferred over powdered form for fluoridation.
a) True

b) False
Answer: b
Explanation: Fluorides in powdered form like sodium fluoride or sodium fluosilicate are toxic and must be contained in air tight containers. Hence, they are not preferred.

486. What happens when water contains 8-20 ppm of fluoride concentration?
a) Blue baby disease b) Crippling fluorosis
c) Dental fluorosis d) Mottling of teeth
Answer: b
Explanation: Dental fluorosis is caused when fluoride concentration is above 3 ppm, whereas Crippling fluorosis is caused when the concentration of fluoride in water is between 8 and 20ppm.

487. The process of reducing the fluoride content from water is called _____
a) Chlorination b) Fluoridation
c) Defluoridation d) Flocculation
Answer: c
Explanation: When the fluoride content in water is high, it is essential to reduce the fluoride content to avoid health related problems and the process of reducing the fluoride content is called defluoridation.
488. Which of the following is not used for defluoridation?
a) Calcium phosphate b) Copper sulfate
c) Alum d) Bone charcoal
Answer: b
Explanation: Copper sulfate is used to remove taste, odor, color and control of algae growth and it is not used for fluoridation.

489. At which temperature, the bone is calcinated during defluoridation with calcium phosphate?
a) 100-200oC b) 200-300oC
c) 400-600oC d) 500-800oC
Answer: c
Explanation: During defluoridation by calcium phosphate, the bone is calcinated at 400-600oC for 10 minutes followed by mineral acid treatment.

490. One cubic metre of bone can treat how much quantity of water containing 3.5 ppm of fluoride?
a) 10m3 b) 100m3
c) 1000m3 d) 10000m3

491. Which material is used in contact filters for the removal of fluorides?

a) Calcium phosphate b) Copper sulfate
c) Synthetic tri-calcium phosphate d) Bone charcoal
Answer: c
Explanation: Synthetic tri-calcium phosphate is used in contact filters for the removal of fluorides. It is made from the milk of lime and phosphoric acid.

492. Which material is used for removing fluorides from hard water containing 3ppm of fluorides?
a) Lime b) Copper sulfate
c) Synthetic tri-calcium phosphate d) Bone charcoal
Answer: a
Explanation: Lime is suitable for removing fluorides from hard water containing less than 4ppm. Magnesium is also removed when this material is used for defluoridation.

493. Fluorex is a special mixture of _____
a) Di-calcium phosphate and carbon
b) Tri-calcium phosphate and hydroxyapatite
c) Di-calcium phosphate and phosphoric acid
d) Tri-calcium phosphate and carbon
Answer: b
Explanation: Fluorex is used for removing fluoride and it is a special mixture of tri-calcium phosphate and hydroxyapatite. It is used as a filter medium

Module-5

Latest Developments in Environmental Pollution Mitigation Tools

494.Remote sensing uses which of the following waves in its procedure?
a) Electric field
b) Sonar waves
c) Gamma- rays
d) Electro-magnetic waves
Explanation: Electro-magnetic waves are used in case of remote sensing. The different waves present in this spectrum enables us to use a variety of waves based on the condition present and can be able have a better output.

495.The relation between velocity, wavelength and frequency can be given as _____
a) $\lambda = c / r$
b) $\lambda = c / f$
c) $\lambda = c / h$
d) $\lambda = h*c / f$

496Which of the following is not a principle of remote sensing?

a) **Interaction of energy with satellite**
b) Electromagnetic energy
c) Electro-magnetic spectrum
d) Interaction of energy with atmosphere

Explanation: Remote sensing involves certain principles which are applied for having a good result of the desired output. The principles are electromagnetic energy, electro-magnetic spectrum, interaction of energy with atmosphere etc.

497Which among the following waves is having less wavelength range?

a) 0.03mm
b) **0.03nm**
c) 0.03m
d) 0.03km

Explanation: A wide range of waves are present in case of electromagnetic spectrum, off which the gamma-rays are having a nano level wave length capacity i.e., less than 0.03nm

498In visible region, the blue light is having a wave length range of _____

a) **0.42-0.52 micrometer**
b) 0.24-0.52 micrometer
c) 0.42-0.92 micrometer
d) 0.22-0.32 micrometer

Explanation: Visible region consist of three color waves red, blue and green remaining are the combination of those. The blue light is having a wavelength range of 0.42-0.52 micrometer.

499Which of the following is not a classification of scattering principle?

a) **Faraday scattering**
b) Rayleigh scattering
c) Mie scattering
d) Non-selective scattering

Explanation: Scattering involves in distribution of the light ray in more than two directions. It can be further classified as Rayleigh scattering, Mie scattering, non-selective scattering.

500Polar orbiting satellites are generally placed at an altitude range of _____

a) 7-15km
b) 7000-15000km
c) **700-1500km**
d) 70-150km

Explanation: Polar orbiting satellites are also known as sun-synchronous satellites, which are generally placed at an altitude range of 700-1500km from the ground level. These are able to deliver accurate information about the object which we need access to.

501 Which of the following field is used by the EM waves?

a) Solar field
b) Polarized field
c) **Electric field**
d) Micro field

Explanation: EM waves used two major sources of fields i.e., electric and magnetic fields. Both are placed orthogonal to each other in a wave pattern. The electric components are placed in vertical manner and magnetic components in horizontal manner.

502 Which one of the following statement is incorrect regarding the electromagnetic radiation?

a) These are produced by the motion of electric charge
b) The oscillation of charged particles sets up changing electric fields
c) he changing electric fields induce the changing magnetic fields in the surrounding medium
d) None of these

503 The changes in the reflectivity/emissivity with time, is called:

a) Spectral variation
b) Spatial variation
c) Temporal variation
d) None of these

504 For interpolation of satellite data used for monitoring dynamic changes that occurs on the earth surface, the most suitable orbit for the satellite is:

a) Circular orbit
b) Sun-synchronous orbit
c) Near polar orbit
d) None of these

505 The altitudinal distance of a geostationary satellite from the earth is about

a) 26,000 km
b) 30,000 km
c) 36,000 km
d) 44,000 km

506.Remote sensing includes gathering of

a) Images
b) Changes
c) Movements
d) Sounds

507.GIS stands for

a) Geographic Information System
b) Generic Information System
c) Geological Information System
d) Geographic Information Sharing

508**GIS deals with which kind of data**

a) Numeric data
b) Binary data
c) **Spatial data**
d) Complex data

509Which of the following statements is true about the capabilities of GIS

a) Data capture and preparation
b) Data management, including storage and maintenance
c) Data manipulation and analysis
d) Data presentation
e) **All of the above**

510**By 'spatial data' we mean data that has**

a) Complex values
b) **Positional values**
c) Graphic values
d) Decimal values

511**'Spatial databases' are also known as**

a) Geodatabases
b) Monodatabases
c) Concurrent databases
d) None of the above

512**Successful spatial analysis needs**

a) Appropriate software
b) Appropriate hardware
c) Competent user
d) All of the above

513Electromagnetic radiation

a) produces a time varying magnetic field and vice versa
b) once generated, remains self-propagating
c) is capable to travel across space
d) consists of magnetic and electric fields
e) **All of these**

514Electromagnetic spectrum contains

a) Gamma rays (wave length < 10^{-10} m)
b) Ultraviolet rays (wave length < 10^{-6} m)
c) Infrared rays (wave length < 10^{-4} m)
d) All of these

515The code based GPS receivers are generally used for

a) Vehicle tracking
b) Land navigation
c) Trans movement
d) All of these

516 Among the following _____ can be expressed as an example of hardware component

a) Keyboard
b) Arc GIS
c) Auto CAD
d) Digitalization

517Which of the following formats can be used for GIS output?

a) DXF
b) PDF
c) GIF
d) HTML

518Among the following, which do not come under the components of GIS?

a) Hardware
b) Software
c) Compiler
d) Data

519Which of the following doesn't determine the capability of GIS?

a) Defining a map
b) Representing cartographic feature
c) Retrieving data
d) Transferring data

520Which of the following acts a benefit of GIS?

a) **Maintaining geo spatial data**
b) Data sharing
c) Accurate data information
d) Presence of data retrieval service

521 Which among the following is a server based hardware platform of GIS?
a) Autodesk Revit
b) STAAD Pro
c) Arc GIS
d) **Google-maps**

522 **Mapmakers use GIS to**
A) store geographic information
B) use geographic information
C) view geographic information
D) store, use and view geographic information

523 The information in GIS is entered and stored as
A) panels
B) layers
C) single panel
D) dual-panel

524 The user can use GIS to make
A) complex analyses only
B) display maps only
C) complex analyses and display maps
D) none of these

525 Melting of polar ice is expected to cover a sea level rise of approximately
a) 10 metre
b) 20 metre
c) 60 metre
d) 100 metre

526 Global Warming Potential (GWP) of a greenhouse gas (GHG) is a factor comparing the global warming impacts of
a) 1 m^3 of GHG with 1 m^3 of CO_2
b) 1 kg of GHG with 1 kg of CO_2

c) 1 gram mole of GHG with 1 gram mole of CO_2
d) 1 kg of GHG with 1 mole of CO_2

527 The term B10 implies
a) Blending of 10 percent biodiesel with 90 percent conventional diesel.
b) Blending of 90 percent biodiesel with 10 percent conventional diesel.
c) Blending of 50 percent biodiesel with 50 percent conventional diesel.
d) Blending of 1 percent biodiesel with 10 percent conventional diesel.

528 The validity period of Environmental Clearance after Environmental Impact Assessment is least for
a) Mining projects
b) River valley projects
c) Harbor projects
d) Area development projects

529 In Environmental assessment study, interpretation and evaluation should consider
a) Uncertainty of possible impacts
b) Significance of measured impacts
c) Comparison of alternatives
d) All of the above

530 Who are responsible for the public consultation process of EIA?
a) State Pollution Control Board
b) State Pollution Control Board and District Collector
c) State Pollution Control Board and CPCB Chairman
d) State Pollution Control Board and Civil Society

531 Environmental Impact Assessment (EIA) is mandatory under which one of the following India legislations:
a) Indian Forest Act
b) Air (Prevention and Control of Pollution) Act
c) Wildlife Protection Act
d) **Environment (Protection) Act**

532 What is Eutrophication?
a) thermal change in water

b) **filling up of water body with aquatic plants due to excessive nutrients**
c) pollution of water due to solid waste
d) none of the above

533In which year EIA was started in India?
a) 1967-68
b) **1976-77**
c) 1986-87
d) 1972-73

534 ISO 14000 standards are for the _____
a) Quality Management System
b) **Environmental Management System**
c) Administration
d) Supply chain

535 Which is the first environmental management system standard?
a) **BS 7750**
b) ISO 9000
c) ISO 9001
d) ISO 9004

536In which year did the current revision of ISO 14001 get published?
a) 2010
b) 2011
c) **2015**
d) 2016

537Which one of the following is not within the purview of ISO 14000 family of standards?
a) Environmental management system
b) Environment auditing
c) Life-cycle assessment
d) **Quality management system**

538What is the full form of NGOs?
a) **Non-Governmental Organizations**
b) Non Governance Organizations
c) No Governance Organizations
d) Null Governmental Organizations

539In which of the following sector NGOs are playing an important role?
a) In governing the police force
b) In framing the policy related to laws
c) **In framing the environmental policy**
d) In deforestation

540 Which one of the following does not belong to the area of Organization Evaluation Standards in ISO 14000 series?

a) Environmental management system
b) Environmental auditing
c) Environmental performance evaluation
d) **Environmental labels and declarations**

541 Which of the following pair of ISO 14000 standards fall under the category of Environmental Management System?

a) **ISO 14001 and ISO 14004**
b) ISO 14010 and ISO 14001
c) ISO 14011 and ISO 14001
d) ISO 14011 and ISO 14004

542 Which of the following pair of ISO 14000 standards fall under the category of Environmental Auditing?

a) ISO 14001 and ISO 14004
b) **ISO 14010 and ISO 14011**
c) ISO 14011 and ISO 14001
d) ISO 14012 and ISO 14004

543 Which ISO 14000 series standard refers to the guidelines on Environmental Performance Evaluation?

a) ISO 14001
b) ISO 14004
c) ISO 14010
d) **ISO 14031**