|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | The uptake of NH4+ by the plant roots result in the release of ----------------- | | | | C |
| A. | NO3 | B. | OH- |
| C. | H+ | D. | H2O |
|  | High amounts of applied P can ---------------------------- Zn uptake by plants | | | | B |
| A. | Increase | B. | Decrease |
| C. | Have no effect | D. | None of the above |
|  | Potassium in soil and plants can be determined by using | | | | D |
| A. | Spectrophotometer | B. | Gas Chromatography |
| C. | Atomic Absorption Spectrophotometer | D. | Flame Photometer |
|  | Eutrophication in rivers and lakes is observed due to the excessive amount of --------------------- | | | | C |
| A. | N | B. | P |
| C. | N and P | D. | P and K |
|  | Volatilization loss of N is relatively more in ----------------------- soils | | | | A |
| A. | Alkaline | B. | Neutral |
| C. | Acidic | D. | All of the above |
|  | ----------------------- is the synthetic organic fertilizer | | | | B |
| A. | DAP | B. | Urea |
| C. | Ammonium nitrate | D. | SOP |
|  | The availability of………. nutrient increases under flooded rice conditions | | | | A |
| A. | Fe | B. | Na |
| C. | Cr | D. | All of the above |
|  | The bacteria involved in nitrification process are | | | | A |
| A. | Autotrophic | B. | Heterotrophic |
| C. | Detritivores | D. | Chemoheterotrophs |
|  | Death of terminal buds in plants is caused due to the deficiency of ------------------ | | | | D |
| A. | Mg | B. | S |
| C. | N | D. | Ca |
|  | K is -------------------- element within plants | | | | B |
| A. | Immobile | B. | Mobile |
| C. | Fixed | D. | Inert |
|  | C:N ratio which results in net mineralization is | | | | D |
| A. | 80:1 | B. | 60:1 |
| C. | 100:1 | D. | 20:1 |
|  | The yellowing of the interveinal areas of new leaves with the veins remaining green indicate the deficiency of | | | | A |
| A. | Fe | B. | N |
| C. | B | D. | Zn |
|  | Because of the narrow margin between the deficiency and toxicity of ---------------, excess dose can easily occur and harm plant growth | | | | C |
| A. | N | B. | P |
| C. | B | D. | Fe |
|  | Hydrolysis is the reaction in which | | | | B |
| A. | Water molecule is added to a compound | B. | Water molecule splits into H+ and OH- ions |
| C. | Both A and B | D. | None |
|  | The metamorphic rocks are formed under conditions of --------------------------- | | | | A |
| A. | High temperature and high pressure | B. | High temperature and low pressure |
| C. | Low temperature and high pressure | D. | Low temperature and low pressure |
|  | --------------------- is a process in which chemical changes take place in rocks and minerals | | | | B |
| A. | Disintegration | B. | Decomposition |
| C. | Distribution | D. | Degeneration |
|  | Minerals containing--------------------- are susceptible to oxidation-reduction reactions | | | | A |
| A. | Fe | B. | Na |
| C. | Ca | D. | All of the above |
|  | The natural inorganic substance of definite chemical composition and with a definite crystal form is known as | | | | A |
| A. | Mineral | B. | Rock |
| C. | Parent material | D. | Soil |
|  | Colluvial parent material is transported by -------- | | | | C |
| A. | Wind | B. | Water |
| C. | Gravity | D. | Ice |
|  | Physical or chemical modification of soil constituents within a developing soil profile is termed as | | | | C |
| A. | Additions | B. | Losses |
| C. | Transformation | D. | Translocation |
|  | ---------------- represent soils of the dry region | | | | B |
| A. | Entisols | B. | Aridisols |
| C. | Mollisols | D. | Vertisols |
|  | -------------------- are the layers of soil between two master horizons | | | | C |
| A. | Master horizons | B. | Soil profiles |
| C. | Transitional horizons | D. | Parent materials |
|  | The most of Pakistani soils belong to ------------ parent material | | | | A |
| A. | Alluvial | B. | Colluvial |
| C. | Glacial | D. | Eolian |
|  | The -----------------of soil is used for estimating the mass of a volume of a soil too large to weigh. | | | | C |
| A. | Infiltration rate | B. | Porosity |
| C. | Bulk density | D. | Particle density |
|  | The silicon tetrahedron in layer silicate clays consists of | | | | B |
| A. | One silicon with 2 O ligands | B. | One silicon with 4 O ligands |
| C. | One aluminum with 4 O ligands | D. | One aluminum with 6 O ligands |
|  | Fe3+ is ---------- form of Iron | | | | A |
| A. | Oxidized | B. | Reduced |
| C. | None | D. | Both A and B |
|  | Quartz is the most | | | | C |
| A. | Easily weatherable mineral | B. | Moderately weatherable mineral |
| C. | Resistant to weathering | D. | None |
|  | Negative value of redox potential indicates | | | | A |
| A. | Presence of reduced conditions | B. | Presence of oxidized conditions |
| C. | Both A and B | D. | None |
|  | In the earth crust the % age of oxygen is | | | | A |
| A. | 47% | B. | 21% |
| C. | 0.03% | D. | 79% |
| 1. - | -------------------- means the water table of saturated layer of soil which is separated from an underlying saturated layer by an unsaturated layer | | | | D |
| A. | High water table | B. | Deep water table |
| C. | Shallow water table | D. | Perched water table |
|  | Molarity is the | | | | C |
| A. | No. of moles dissolved per liter of solvent | B. | No. of mole charges dissolved per liter of solution |
| C. | No. of moles dissolved per lietr of solution | D. | No of moles dissolved per Kg of solvent |
|  | A soil having EC < 4 dS m-1 and SAR > 13 (mmol L-1)1/2 is termed as | | | | B |
| A. | Saline soil | B. | Sodic soil |
| C. | Normal soil | D. | Saline sodic soil |
|  | Plants having the ability to accumulate heavy metals in higher concentration are called | | | | B |
| A. | Excluders | B. | Hyperaccumulators |
| C. | Halophytes | D. | None of the above |
|  | The ratio of the chemical activity of any substance to its [molar](https://www.britannica.com/science/mole-chemistry) concentration is known as | | | | C |
| A. | Concentration | B. | Activity |
| C. | Activity Coefficient | D. | Concentration Coefficient |
|  | The thickness of DDL decrease as the electrolyte concentration --------------- in bulk soil | | | | A |
| A. | Increases | B. | Decreases |
| C. | Diminishes | D. | None of the above |
| 1. T | The principal source of charge in 2:1 type silicate mineral is | | | | C |
| A. | Variable charge | B. | pH dependent charges |
| C. | Isomorphic substitution | D. | Point of zero charge |
|  | A liming material neutralizes acidity by producing | | | | A |
| A. | OH- ions | B. | H+ ions |
| C. | Al3+ ions | D. | All of the above |
|  | Primarily soil is an --------- environment; the elements, such as carbon, nitrogen, sulfur and iron, will tend to be in the -------------- state in the soil | | | | B |
| A. | Aerobic; reduced | B. | Aerobic; oxidized |
| C. | Anerobic; reduced | D. | Anerobic; reduced |
|  | The organisms completely dependent on atmospheric O2 for growth are known as ---------------- | | | | D |
| A. | Facultative aerobes | B. | Acidophiles |
| C. | Osmotolerant | D. | Obligate aerobes |
|  | Biostimulation is the addition of ------------------- to stimulate indigenous microorganisms | | | | C |
| A. | Water | B. | Gases |
| C. | Nutrients | D. | Growth regulators |
|  | ---------------------------------- is defined as use of plants to remove, contain or transform contaminants | | | | B |
| A. | Bioremediation | B. | Phytoremediation |
| C. | Bioventing | D. | Bioaugmentation |
|  | A substance that promotes the rate of reaction is called **-----------------** | | | | A |
| A. | Catalyst | B. | Stimulant |
| C. | Regulator | D. | Enhancer |
|  | The process where both the electron donor and electron acceptor are organic in nature is known as ------ | | | | C |
| A. | Anaerobic respiration | B. | Reduction |
| C. | Fermentation | D. | Oxidation |
|  | Mesophiles grow at temperature of ----------- | | | | A |
| A. | 20-35 Celsius | B. | 20-35 Fahrenheit |
| C. | At freezing | D. | At boiling |
|  | Bacteria influence plant growth by producing ------------ | | | | C |
| A. | Hormones | B. | Toxins |
| C. | Hormones or toxins | D. | Spores |
|  | ------------------- is an enzyme involved in BNF | | | | D |
| A. | Urease | B. | Lipase |
| C. | Phosphorylase | D. | Nitrogenase |
|  | Actinomycetes often predominate in soils subjected to prolonged -------------- | | | | B |
| A. | Wetting | B. | Drying |
| C. | Anoxia | D. | Freezing |
|  | Which of the following terms describes organisms that thrive in the cold? | | | | C |
| A. | Mesophiles | B. | Thermophiles |
| C. | Psychrophiles | D. | Aerophiles |
|  | Which of the following best describes biodegradation? | | | | D |
| A. | Breakdown of organic molecule | B. | Fragmentation of a complex organic molecule |
| C. | Complete transformation of the organic molecule to mineral forms | D. | All of the above |
|  | Humus is a decomposed form of | | | | A |
| A. | Soil organic matter | B. | Hormones |
| C. | Soil microorganisms | D. | Hemicellulose |
|  | -------------------- is used to disperse soil in soil textural analysis | | | | C |
| A. | Sodium metabisulfite | B. | Sodium heptahydrate |
| C. | Sodium hexametaphosphate | D. | Sodium hexafluorosilicate |
|  | High concentration of carbonates and bicarbonates in irrigation water causes the soluble calcium to turn into -------------------- nodules | | | | A |
| A. | Calcium carbonate | B. | Calcium sulphate |
| C. | Calcium Nitrate | D. | Calcium hydroxide |
|  | ------------------- plants are capable of growth at high salt concentrations | | | | B |
| A. | Glycophytes | B. | Halophytes |
| C. | Hydrophytes | D. | Xeropytes |
|  | ---------------- is an example of halophyte plants | | | | B |
| A. | Maize | B. | Saltbush |
| C. | Wheat | D. | Rice |
|  | The diameter of clay particles is | | | | D |
| A. | < 2 mm | B. | < 0.2 mm |
| C. | <0.02 mm | D. | < 0.002 mm |
|  | The average value of particle density for most of the mineral soils is considered as | | | | A |
| A. | 2.65 Mg/m3 | B. | 2.75 Mg/m3 |
| C. | 2.85 Mg/m3 | D. | 2.95 Mg/m3 |
|  | Clay soils have | | | | C |
| A. | Dominance of macropores with large total porosity | B. | Dominance of macropores with small total porosity |
| C. | Dominance of micropores with large total porosity | D. | Dominance of micropores with small total porosity |
|  | The rate at which soil oxygen exchanges with atmospheric oxygen | | | | B |
| A. | Oxygen dependent rate | B. | Oxygen diffusion rate |
| C. | Oxygen transfer rate | D. | Oxygen stimulation rate |
|  | The soil water potential at permanent wilting point is | | | | A |
| A. | ≤ -1500 kPa | B. | > -1500 kPa |
| C. | -10 to -33 kPa | D. | ≥ -10 kPa |
|  | Sodic soils are | | | | B |
| A. | Flocculated | B. | Dispersed |
| C. | Aggregated | D. | Porous |
|  | Soil buffering capacity indicates its ability to resist change in | | | | A |
| A. | pH | B. | EC |
| C. | CEC | D. | AEC |
|  | Any material applied to the soil to make it more suitable for plant growth is known as -------- | | | | D |
| A. | Fertilizer | B. | PGPR |
| C. | Hormone | D. | Amendment |
|  | A green manure crop should have all the characteristics except | | | | B |
| A. | Fast growing | B. | High nutrient requirement |
| C. | Well adapted to local conditions | D. | Ability to fix atmospheric N |
|  | Soil organic matter can be improved by all the following practices except | | | | D |
| A. | Green manuring | B. | Addition of FYM |
| C. | Incorporation of crop residues | D. | Intensive tillage |
|  | The arrangement of primary soil particles into secondary particles or units called aggregates is known as | | | | C |
| A. | Soil texture | B. | Soil textural class |
| C. | Soil structure | D. | Soil bulk density |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | | **Answer Key** |
|  | Which of the following would be the most important in affecting soil temperature? | | | | | A |
| A | Water content | | B | Humus content |
| C | Clay content | | D | CaCO3 content |
|  | permanent charge is not developed on following fractions of soils | | | | | A |
| A | oxides of Fe and Al | | B | 2:1 type silicate clay |
| C | 2:1:1 type silicate clay | | D | All of above |
| 1. Z | Positive charge will develop on humus due to | | | | | A |
| A | Protonation of humus | | B | Deprotonation of humus |
| C | Decomposition of humus | | D | None of above |
|  | Zinc cannot replace silicon in central position of tetrahedron due to | | | | | C |
| A | Difference in charge | | B | Difference in valency |
| C | Difference in size | | D | None of above |
| 1. v | Allophanes and amorphous minerals cannot develop permanent charge due to | | | | | C |
| A | Very small size | | B | They are secondary minerals |
| C | They don’t have crystalline structure | | D | None of above |
|  | The diffusion of oxygen is \_\_\_\_\_\_\_\_ times faster in air than in water filled pores. | | | | | C |
| A | | 100 | B | 1000 |
| C | | 10000 | D | 100000 |
|  | Soil bulk density is defined as mass of unit volume of dry soil, this volume includes | | | | | A |
| A | Both solid and pores | | B | Only soil |
| C | Only pores | | D | Neither solid nor pores |
|  | In big trees water moves from soil to the highest levels of plants due to \_\_\_\_\_\_\_\_\_\_\_\_\_. | | | | | B |
| A | Cohesive forces | | B | Cohesive and adhesive forces |
| C | Adhesive forces | | D | Osmosis |
|  | Soil is multiphase system which consists of | | | | | C |
| A | inorganic solid phase, liquid phase and gaseous phase | | B | inorganic and organic solid phase, liquid phase and semi-liquid phase |
| C | inorganic and organic solid phase, gaseous phase and liquid phase | | D | None of above |
|  | ------------------ are involved both in mineralization and immobilization of phosphorus in soil | | | | | D |
| A. | Bacteria | | B. | Fungus |
| C. | Mycorrhizae | | D. | All of these |
|  | Cooler liquids and gases always | | | | | B |
| A. | Rise up | | B. | Sinks |
| C. | Expands | | D. | None |
|  | Soil colloid has size | | | | | A |
| A. | < 1 µm | | B. | > 1 µm |
| C. | 1 µm | | D. | None of above |
|  | Unconsolidated mantle of weathered rock on the earth’s surface, loose earth above solid rock is known as | | | | | A |
| A. | Regolith | | B. | Parent material |
| C. | Bed rock | | D. | None of above |
|  | Hot viscous molten material which remains beneath earth surface is known as | | | | |  |
| A. | Lava | | B. | Magma |
| C. | Both of above | | D. | None of above |
|  | The rocks formed from hot molten material above eath surface is known as | | | | | C |
| A. | Acid igneous rocks | | B. | Intrustive igneous rocks |
| C. | Extrusive igneous rocks | | D. | Mafic rocks |
|  | If magma is rich in Al and Si then rocks formed are known as | | | | |  |
| A. | Acid igneous rocks | | B. | Mafic igneous rocks |
| C. | Intermediate igneous rocks | | D. | All of above |
|  | Azolla-Anabaena interaction is an example of | | | | | C |
| A. | Symbiotic nitrogen fixation | | B. | Non-symbiotic nitrogen fixation |
| C. | Associative symbiotic nitrogen fixation | | D. | This association cannot fix nitrogen |
|  | Intrusive igneous rocks which are formed at shallow depth are known as | | | | | B |
| A. | Plutonic | | B. | Hypabassal |
| C. | Hypobassal | | D. | None of above |
|  | Each layer in sedimentary rocks is separated from other layer by a line of demarcation known as | | | | | C |
| A. | Cleavage plane | | B. | Fracturing plane |
| C. | Bedding plane | | D. | None of above |
|  | The rocks formed from accumulation of debris of rocks over each other are known as | | | | | B |
| A. | Igneous rocks | | B. | Sedimentary rocks |
| C. | Metamorphic rocks | | D. | None of above |
|  | Metamorphic rocks could be the product of metamorphism of | | | | | C |
| A. | Igneous rocks | | B. | Sedimentary rocks |
| C. | Both of above | | D. | None of above |
|  | Minerals which are not altered chemically since their formation are known as | | | | | B |
| A. | Clay minerals | | B. | Primary minerals |
| C. | Secondary minerals | | D. | All of above |
|  | Pakistani soils are rich in | | | | | A |
| A. | Mica type minerals | | B. | Oxide minerals |
| C. | Allophanes | | D. | All of above |
|  | Calcite is the example of | | | | | B |
| A. | Tertiary Minerals | | B. | Secondary minerals |
| C. | Primary minerals | | D. | None of above |
|  | Quartz is the example of | | | | | A |
| A. | Primary minerals | | B. | Secondary minerals |
| C. | Tertiary minerals | | D. | None of above |
|  | Dominant clay mineral in Pakistani soils is | | | | | A |
| A. | Mica | | B. | Kaolinite |
| C. | Montmorillonite | | D. | Chlorite |
|  | In silicate minerals, basic builing blocks are | | | | | C |
| A. | Tetrahedron | | B. | Octahedron |
| C. | Tetra and octahedron | | D. | None of above |
|  | One gram of soil organic matter can hold \_\_\_\_\_\_\_\_ mL of water | | | | | A |
| A | 20 | | B | 40 |
| C | 10 | | D | None of the above |
|  | The rate of aeration in soil mainly depends on volume and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of pores. | | | | | B |
| A | Diameter | | B | Continuity |
| C | Discontinuity | | D | Capability |
|  | Smectite is the example of | | | | | A |
| A. | Expanding type silicate clay | | B. | Non-expanding type silicate clay |
| C. | Both of above | | D. | None of above |
|  | Precursor of silicate clay minerals in soils is | | | | | A |
| A. | Mica | | B. | Illite |
| C. | Montmorillonite | | D. | None of above |
|  | Nitrogen fixation in legumes is carried out by | | | | | A |
| A. | Rhizobium | | B. | Fungi |
| C. | Blue green algae | | D. | All of above |
|  | Nitrifcation is carried out by | | | | | C |
| A. | Nitrobactor | | B. | Nitrosomonas |
| C. | Both A & B | | D. | None of above |
|  | Mycorrhiza develops association with plant roots to enhance the absorption of | | | | | A |
| A. | Phosphorus | | B. | Nitrogen |
| C. | Potassium | | D. | None of above |
|  | Biological nitrogen fixation is carried out by | | | | | D |
| A. | Free living bacteria | | B. | Symbiotic bacteria |
| C. | Associative symbiotic bacterial | | D. | All of above |
|  | Decomposition of OM is carried out dominantly by | | | | | A |
| A. | Aerobic microbes | | B. | Anaerobic microbes |
| C. | Both of above | | D. | None of above |
|  | Under anaerobic conditions, decomposition of organic matter leads to the formation of | | | | | A |
| A. | CH4 | | B. | CO2 |
| C. | CO | | D. | All of above |
|  | Under anaerobic decomposition of organic matter, one of the following gas is not produced | | | | | C |
| A. | H2S | | B. | CH4 |
| C. | CO2 | | D. | All of above |
|  | Sodication is the process where | | | | | B |
| A. | Sodium is leached from soil | | B. | Sodium accumulates in soil |
| C. | Sodium remained unchanged | | D. | None of above |
|  | Installation of tubewells is not one of the following approach to ameliorate water-logged soils | | | | | C |
| A. | Subsurface drainage | | B. | Vertical drainage |
| C. | Surface drainage | | D. | None of above |
|  | In saline agriculture, slightly saline soils are cultivated to grow | | | | | C |
| A. | Salt tolerant fruit trees | | B. | Salt-tolerant bushes |
| C. | Salt-tolerant field crops | | D. | None of above |
|  | High RSC water cause sodicity in soils | | | | | B |
| A. | Directly by increasing Na in soil | | B. | Indirectly by precipitating CaCO3 and other sparingly soluble Ca salts |
| C. | Both of above | | D. | None of above |
|  | One of the following is not quality criteria of irrigation water | | | | | B |
| A. | EC | | B. | pH |
| C. | RSC | | D. | SAR |
|  | Hazardous effects of water on soil would be more if | | | | | B |
| A. | Irrigation water contains high Ca:Mg ratio | | B. | Irrigation water contain low Ca:Mg ratio |
| C. | Irrigation water has equal concentration of Ca and Mg | | D. | None of above |
|  | Dark coloured soils are considered most fertile as they contain | | | | | C |
| A. | Gravel and Sand | | B | Sand and calcium |
| C. | Clay and humus | | D | Silt and earth worm |
|  | Which of the following N fertilizer is better for salt-affected soils | | | | | A |
| A. | Ca(NO3)2 | | B. | Nitrophos |
| C. | Urea | | D. | All of above |
|  | Using high EC water to improve soil permeability is known as | | | | | B |
| A. | Electro-hydro-technical approach | | B. | Hydro-technical approach |
| C. | Synergestic approach | | D. | All of above |
|  | Biological reclamation approach would be effective in one of the following type of salt-affected soils | | | | | B |
| A. | Non-calcaeous saline-sodic soils | | B. | Calcareous saline-sodic soils |
| C. | Calcareous and non-calcareous soils | | D. | All of above |
|  | One of the following amendments is the most efficient in reclamation of saline soils | | | | | D |
| A. | Gypsum | | B. | Sulfuric acid |
| C. | Sulfur | | D. | None of above |
|  | Excessive tillage practices cause the degradation of soil quality by | | | | | D |
| A. | Deteriorating soil structure | | B. | Exposing organic matter and enhancing its decomposition |
| C. | Excessive bulk density | | D. | All of above |
|  | Keeping ground cover is beneficial as it | | | | | B |
| A. | Protects soil cover and deteriorate soil quality | | B. | Protect soil and improves soil quality |
| C. | Protect soil but neither improve nor deteriorate soil quality | | D. | None of above |
|  | One of the following elements is the major building block of life on earth | | | | | C |
| A. | Nitrogen | | B. | Phosphorus |
| C. | Carbon | | D. | None of above |
|  | Sugarcane, potatoes, and banana have high requirement for | | | | | C |
| A. | Nitrogen | | B. | Phosphorus |
| C. | Potassium | | D. | Iron |
|  | The most important benefit of carbon sequestration is | | | | | C |
| A. | Enhancing OM in soil | | B. | Enhancing crop productivity |
| C. | Mitigation of climate change | | D. | All of above |
|  | Minimum possible disturbance of soil to grow crops with objective to protect soil carbon is known as | | | | | B |
| A. | Zero tillage | | B | Conservation tillage |
| C. | Both of above | | D | none of above |
|  | Spreading synthetic or natural material on the surface to conserve soil moisture is known as | | | | | C |
| A. | Green manuring | | B. | Crop residue management |
| C. | Mulching | | D. | All of above |
|  | Presence of variety of living organisms in soil is called as | | | | | C |
| A. | Soil biology | | B. | Soil microbiology |
| C. | Soil biodiversity | | D. | All of above |
|  | Examples of macrofauna in soil include | | | | | C |
| A. | Moles, mites, prairie dogs, earthworms, millipede | | B. | Moles, mites, nematodes, earthworms, millipedes |
| C. | Moles, prairie dogs, earthworms, millipede | | D. | None of above |
|  | Nitrogen is absorbed by the plants in the following forms via roots | | | | | C |
| A. | Ammonia, nitrate, urea | | B. | Ammonium, nitrite, urea |
| C. | Ammonium, nitrate | | D. | None of above |
|  | Phosphorus moves to the plants roots through process known as | | | | | B |
| A. | Osmosis | | B. | Diffusion |
| C. | Mass flow | | D. | All of above |
|  | In alkaline soils, P is absorbed by the plants in following forms | | | | | B |
| A. | Primary orthophosphate | | B. | Secondary orthophosphate |
| C. | Phosphate | | D. | None of above |
|  | Insoluble form of P in soils is in the form of | | | | | C |
| A. | KH2PO4 | | B. | KHPO4 |
| C. | Apatite | | D. | None of above |
|  | Urea contains N | | | | | A |
| A. | 46% | | B. | 21% |
| C. | 18% | | D. | None of above |
|  | Single superphosphate contain Ca | | | | | A |
| A. | 46% | | B. | 50% |
| C. | 30% | | D. | None of above |
|  | Immobilization is the reverse mechanism of | | | | | C |
| A. | Adsorption | | B. | Precipitation |
| C. | Mineralization | | D. | Chemisorption |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | **Answer Key** |
|  | Ions uptake by plants is the fastest through ------------------------------. | | | | B |
| A. | Ion pumps | B. | channels |
| C. | Carrier | D. | transporters |
|  | Process by which N is lost in the atmosphere in the form of N2O is called as -------------------------. | | | | B |
| A. | Nitrification | B. | Denitrification |
| C. | Ammonification | D. | Volatilization |
|  | When biodegradation is facilitated through microorganism is called as ------------------------- | | | | B |
| A. | Bioventing | B. | Bioaugmentation |
| C. | Biostimulation | D. | All A, B and C |
|  | Narrow C:N ratio results in net -------------------------------------- | | | | D |
| A. | Immobilization | B. | Nitrification |
| C. | Denitrification | D. | Mineralization |
|  | SO4 reduction -----------------------------by adding organic matter | | | | B |
| A. | Decreases | B. | Increases |
| C. | Remain unchanged | D. | May increase or decrease |
|  | A filamentous network of hyphae that branch and grow only by apical extension ------------------------ | | | | A |
| A. | Mycelia | B. | Rhizoids |
| C. | Thallus | D. | No option is correct |
|  | In the sexual cycle of fungi, ---------------------------------is the encapsulation of each haploid nucleus and its associated cytoplasm in a discrete cell that differentiate into a spore | | | | B |
| A. | Meiosis | B. | Telomorph |
| C. | Karyogamy | D. | Plasmogamy |
|  | ----------------------phytohormone is involved in decreasing the loss of water in plants under water stress conditions | | | | A |
| A. | Abscisic acid | B. | Cytokinins |
| C. | Auxins | D. | Ethylene |
|  | ------------------------- is the most common cytokinin in plants | | | | D |
| A. | Indol-3-acetic acid | B. | Tryptophan |
| C. | Mevalonic acid | D. | Zeatin |
|  | -------------------------- was initially known as ripening hormone | | | | A |
| A. | Ethylene | B. | Cytokinins |
| C. | Gibberellins | D. | Abscisic acid |
|  | The cyanobacteria contain--------------------------------- | | | | C |
| A. | Both Chlorophyll a and b | B. | Chlorophyll b |
| C. | Chlorophyll a | D. | None of a or b |
|  | The largest contribution to biological N2 fixation from free living organisms is made by------------------------ | | | | B |
| A. | Azospirillum | B. | Cyanobacteria |
| C. | Azotobacter | D. | Azolla |
|  | In flood water, because of the photosynthetic activity of algae and aquatic plants, O2 may be oversaturated by --------- | | | | A |
| A. | 200% | B. | 250% |
| C. | 100% | D. | 150% |
|  | The driving force in case of horizontal infiltration is---------------------------- | | | | A |
| A. | Matric potential | B. | Gravitational potential |
| C. | Pressure potential | D. | Solute potential |
|  | --------------------------is the ease with which an object can be pushed or driven into the soils. | | | | A |
| A. | Penetrability | B. | Hydrolyic conductivity |
| C. | Infiltrability | D. | None of these |
|  | The property of a fluid whereby it tends to resist relative flow within itself is called---------------- | | | | D |
| A. | Capillarity | B. | Surface tension |
| C. | Polarity | D. | Viscosity |
|  | ------------------------------ is a colligative property of solutions. | | | | B |
| A. | Specific heat | B. | Osmotic pressure |
| C. | Hydrostatic pressure | D. | Pneumatic potential |
|  | -------------------is due to the position and condition of soil water. | | | | B |
| A. | Kinetic energy | B. | Potential energy |
| C. | Free energy | D. | Both a and b |
|  | -------------------is the portion of the soil water potential that results from adsorptive forces of the soil matrix. | | | | D |
| A. | Pneumatic potential | B. | Envelope potential |
| C. | Solute potential | D. | Matric potential |
|  | ---------------------is the major factor affecting the movement of water from soil to plant roots in unsaturated soils. | | | | B |
| A. | Gravitational potential | B. | Matric potential |
| C. | Pressure Potential | D. | Solute potential |
|  | For single ring diameter should not be less than ------------------------------ | | | | D |
| A. | 25 cm | B. | 75 cm |
| C. | 50 cm | D. | 100 cm |
|  | The property of a fluid whereby it tends to resist relative flow within itself is called\_------------------------\_\_\_\_\_\_\_\_\_\_\_\_ | | | | C |
| A. | Surface tension | B. | Polarity |
| C. | Viscosity | D. | Capillarity |
|  | The colligative properties of soil solutions depend on the ------------------------ of molecules or ions. | | | | B |
| A. | Nature | B. | Concentration |
| C. | Active concentration | D. | Both a and b |
|  | ----------------------------- is a colligative property. | | | | A |
| A. | Osmotic pressure | B. | Specific heat |
| C. | Hydrostatic pressure | D. | Pneumatic potential |
|  | --------------------is due to the position and condition of soil water. | | | | A |
| A. | Potential energy | B. | Kinetic energy |
| C. | Free energy | D. | Both a and b |
|  | --------------------- is the portion of the soil water potential that results from adsorptive forces of the soil matrix. | | | | C |
| A. | Envelope potential | B. | Solute potential |
| C. | Matric potential | D. | Pneumatic potential |
|  | ------------------is the major factor affecting the movement of water from soil to plant roots in unsaturated soils. | | | | A |
| A. | Matric potential | B. | Solute potential |
| C. | Pressure Potential | D. | Gravitational potential |
|  | In saturated soils the pressure potential is \_------------------------ | | | | B |
| A. | Negative | B. | Positive |
| C. | Zero | D. | Bothe A and B |
|  | The overburden potential is always ------------------------ and is only important in swelling soils. | | | | A |
| A. | Positive | B. | Negative |
| C. | Zero | D. | Both A and B |
|  | Field capacity is the amount of water held in the soil at a water potential less than-----------------depending on soil type. | | | | D |
| A. | -10 to -33 kPa | B. | 0.1 to 0.3 bars |
| C. | More than -10 kPa | D. | Bothe A and B |
|  | Permanent wilting point is the lower limit of available water and generally held at a water potential lower than ------- | | | | B |
| A. | -33 kPa | B. | -1500 kPa |
| C. | -3100 kPa | D. | None of the above |
|  | The amount of water evaporated and transpired in (kg) to produce one kg of dry plant material is called ------------- | | | | A |
| A. | Water use efficiency | B. | Transpiration ratio |
| C. | Consumptive use of water | D. | Photosynthetic rate |
|  | Soil particles greater than------------------- are grouped as gravels and stones. | | | | A |
| A. | 2 mm | B. | 0.0002 mm |
| C. | 0.002 mm | D. | 0.02 mm |
|  | Deflocculation is carried out by means of a chemical -------------- | | | | C |
| A. | H2O2 | B. | Sodium bicarbonate |
| C. | Sodium Hexametaphosphate | D. | Calcium Hydroxide |
|  | Hydrometer readings for texture analysis doesn’t require calibration if the temperature is -------------------------°C. | | | | B |
| A. | 68 | B. | 20 |
| C. | 70 | D. | 24 |
|  | Kaolinite has specific surface area----------------------------m2g-1. | | | | B |
| A. | 60-80 | B. | 20-40 |
| C. | 10-20 | D. | 40-60 |
|  | A soil which has equal proportion of sand, silt and clay is called---------------------. | | | | B |
| A. | Loam | B. | Clay loam |
| C. | Silt loam | D. | Sandy loam |
|  | Which is physical property of soil--------------------. | | | | B |
| A. | Hydration | B. | Density |
| C. | Reduction | D. | Oxidation |
|  | About -----------------% Pakistani soils are deficient in potassium. | | | | A |
| A. | 40 | B. | 60 |
| C. | 20 | D. | 70 |
|  | Muriate of potash contains---------------------. | | | | B |
| A. | 50% K2O | B. | 60% K2O |
| C. | 40% K2O | D. | 60% K |
|  | Conversion of R-NH2 to NH4 is called------------- | | | | A |
| A. | Ammonification | B. | Nitrification |
| C. | Denitrification | D. | Aminization |
|  | Causes of P precipitation includes ------------------. | | | | D |
| A. | Soil calcareousness | B. | Fe and Al in soil, |
| C. | Organic matter | D. | Both A and B |
|  | Ni activates ----------------------------------enzyme. | | | | B |
| A. | Nitrate reductase | B. | Urease |
| C. | Nitrogenase | D. | Urease & nitrogenase |
|  | Basic components required to recommend the nutrient rate for a crop include-------------------. | | | | D |
| A. | Removal by crop | B. | Soil nutrient content |
| C. | Fertilizer use efficiency | D. | All of above |
|  | Readily plant available K fractions in soil are-----------------. | | | | D |
| A. | exchangeable K | B. | water soluble K |
| C. | non-exchangeable K | D. | A & B |
|  | Alfalfa can fix atmospheric N with the help N-fixing bacteria more than------------ kg ha-1year-1. | | | | A |
| A. | 100 | B. | 50 |
| C. | 20 | D. | 30 |
|  | Conversion of N2 to NH3 requires enzyme ----------------------. | | | | C |
| A. | Nitrate reductase | B. | Urease |
| C. | Nitrogenase | D. | Urease & nitrogenase |
|  | Plant available forms of B form----------------------. | | | | D |
| A. | H3BO3 | B. | BO3- |
| C. | H2BO3- | D. | H3BO3 & H2BO3- |
|  | Optimum concentration of a macronutrient in dry plant tissue is --------------------- mg kg-1. | | | | B |
| A. | <500 | B. | >500 |
| C. | <100 | D. | >100 |
|  | For optimum plant growth 12 mg P2O5 kg-1 soil is considered as -----------------------. | | | | C |
| A. | Adequate | B. | Very high |
| C. | Deficient | D. | Severely deficient |
|  | Fresh plant tissue contains about --------------------------- minerals elements. | | | | A |
| A. | 0.5% | B. | 10% |
| C. | 5% | D. | 1% |
|  | Use efficiency of phosphatic fertilizers in calcareous soils is ----------------------------. | | | | A |
| A. | 20-30% | B. | 50-60% |
| C. | 60-70% | D. | 40-50% |
|  | Potassium is -----------------------------in plants. | | | | A |
| A. | Mobile | B. | Not mobile |
| C. | Very immobile | D. | Slightly mobile |
|  | Total number of essential elements for plant growth are---------------------------. | | | | B |
| A. | 16 | B. | 17 |
| C. | 15 | D. | 18 |
|  | Most important soil constituents with respect to heavy metals dynamics in soils are------------------. | | | | D |
| A. | oxides of Fe/Mn | B. | Organic Matter |
| C. | CaCO3 | D. | all of these |
|  | Long distance transport of heavy metals is through---------------------------. | | | | A |
| A. | Irrigation water | B. | Air |
| C. | Wind storm | D. | Rainfall |
|  | Heavy metals that are plant nutrients are -------------------------------. | | | | A |
| A. | Ni and Zn | B. | Fe and Pb |
| C. | Mn and Co | D. | all of these |
|  | Heavy metal retention by soil constituents is through ----------------------------. | | | | A |
| A. | adsorption | B. | desorption |
| C. | chelation | D. | complexation |
|  | Heavy metal contaminated soil can be improved through------------------. | | | | D |
| A. | amendment | B. | phytostabilization |
| C. | phytoremediation | D. | all of these |
|  | Effective concentration the soil solution is called as------------------------ . | | | | A |
| A. | activity | B. | concentration |
| C. | activity coefficient | D. | Gapon Coefficient |
|  | Water with high Mg:Ca ratio causes ------------------------------ in soil. | | | | C |
| A. | flocculation | B. | Aggregation |
| C. | Dispersion | D. | No effect |
|  | Water having EC 2 dS m-1 is --------------------------------- for irrigation. | | | | B |
| A. | Fit | B. | Not fit |
| C. | Marginally Fit | D. | sodic but fit |
|  | Salt affected soils have EC more than -------------------------------- dS m-1. | | | | C |
| A. | 15 | B. | 13 |
| C. | 4 | D. | 5 |
|  | Soil textural analysis is theoretically based on ---------------------- | | | | C |
| A. | Newton’s law | B. | Dalton’s Law |
| C. | Stock’s Law | D. | Archimedes Law |
|  | Urea contains N in the form of -------------------------- | | | | A |
| A. | Ammonium | B. | Nitrate |
| C. | Nitrite | D. | All |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | **Answer Key** |
|  | The flooded soil predominately has \_\_\_\_\_ environment; the elements, such as carbon, nitrogen, sulfur and iron, will tend to be in the \_\_\_\_\_ state in the soil. | | | | C |
| A. | Aerobic; oxidized | B. | Aerobic; reduced |
| C. | Anaerobic; reduced | D. | Anaerobic; oxidized |
|  | ----------------- ratio is the most critical that determines whether nitrogen is mineralized or immobilized | | | | B |
| A. | C/P | B. | C/N |
| C. | C/S | D. | None of these |
|  | The rate of diffusion of O2 in air \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the rate of diffusion of O2 in water | | | | B |
| A. | Is exactly or approximately equal to | B. | Is greater than |
| C. | Is less than | D. | Is 1000 times less than |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_is the microbial process of production of nitrogen from NO3 | | | | D |
| A. | Nitrification | B. | Volatilization |
| C. | Mineralization | D. | Denitrification |
|  | Compact soil has\_\_\_\_\_\_\_\_\_\_ bulk density as compared to loose soils | | | | B |
| A. | Low | B. | High |
| C. | Same | D. | None of the above |
|  | Soil particles less than \_\_\_\_\_\_\_\_\_\_\_\_in diameter is considered as soil clay particle | | | | C |
| A. | 2cm | B. | 2mm |
| C. | 2µm | D. | None of the above |
|  | A soil which have equal properties of sand, silt and clay is called\_\_\_\_\_\_\_\_\_\_ | | | | D |
| A. | Sandy loam | B. | Silt loam |
| C. | Clay loam | D. | Loam |
|  | \_\_\_\_\_\_\_\_\_refers to the size of individual soil particles. | | | | A |
| A. | Texture | B. | Structure |
| C. | Porosity | D. | Bulk density |
|  | The surface soil of a puddled rice field generally have | | | | C |
| A. | Granular structure | B. | Columnar structure |
| C. | No structure | D. | None of these |
|  | Which of the following soil separate has more erodibility | | | | B |
| A. | Clay | B. | Silt |
| C. | Sand | D. | Gravel |
|  | Layer developed below surface soil due to excess ploughing is called\_\_\_\_\_\_\_\_ | | | | B |
| A. | Tillage | B. | Plough pan |
| C. | Cultivation | D. | Both A and c |
|  | The management of saline soil is \_\_\_\_\_ | | | | A |
| A. | Removal of soluble salts through leaching and drainage | B. | With addition of Ca –amendments |
| C. | Both (a) and (b) | D. | None |
|  | Phosphorus is carried with the sediment, contributing to \_\_\_\_\_ | | | | A |
| A. | eutrophication | B. | Depletion |
| C. | mineralization | D. | Both c and b |
|  | Calcite is related to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ availability in calcareous soils. | | | | C |
| A. | Phosphorus | B. | Boron |
| C. | Calcium | D. | both a & b |
|  | Sulfur oxidizing bacteria are mostly active in \_\_\_\_\_\_\_ soils | | | | A |
| A. | Aerated | B. | Waterlogged |
| C. | Submerged | D. | All the above |
|  | Zinc is mostly deficient in soil under \_\_\_\_\_\_\_\_\_\_\_\_\_ crop | | | | B |
| A. | Sugarcane | B. | Paddy |
| C. | Berseem | D. | Sasamum |
|  | Surface mulches are useful to | | | | B |
| A. | Decrease leaching | B. | Decrease evaporation |
| C. | Increase water loss | D. | Increase evaporation |
|  | Generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_instrument is used for the determination of phosphorus in plants. | | | | A |
| A. | Spectrophotometer | B. | Atomic Absorption Spectrophotometer |
| C. | Flame Photometer | D. | All of the above |
|  | The thickness of DDL decrease as the electrolyte concentration in bulk soil solution…………. | | | | A |
| A. | Increases | B. | Decreases |
| C. | Unchanged | D. | None of these |
|  | The uptake of NO-3 by the plant roots result in the release of \_\_\_\_ | | | | B |
| A. | NH4+ | B. | OH- |
| C. | H+ | D. | H2O |
|  | The conversion of amino acids into ammonium is called \_\_\_\_\_ | | | | B |
| A. | Aminization | B. | Ammonification |
| C. | Mineralization | D. | Nitrification |
|  | Most of the P present in soil is transported to root surface through\_\_\_\_\_ | | | | A |
| A. | Diffusion | B. | Root Interception |
| C. | Mass flow | D. | Bulk flow |
|  | The conversion of NH4+into NO3 -is called\_\_\_ | | | | A |
| A. | Nitrification | B. | Ammonification |
| C. | Mineralization | D. | N fixation |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a best method of phosphorus application. | | | | B |
| A. | Broadcasting | B. | Band placement |
| C. | Foliar application | D. | Top dressing |
|  | Conversion of organic form of a nutrient into its inorganic form is called\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Mineralization | B. | Immobilization |
| C. | Ammonification | D. | Fixation |
|  | Which one is not a criteria for the quality judgment of irrigation water…………….. | | | | B |
| A. | EC | B. | ESP |
| C. | SAR | D. | RSC |
|  | Halophytes are also known as | | | | A |
| A. | Salt loving plants | B. | Salt sensitive plant |
| C. | Salt excluders | D. | Herbaceous |
|  | Generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ instrument is used for the determination of potassium in plants. | | | | C |
| A. | Spectrophotometer | B. | Atomic Absorption Spectrophotometer |
| C. | Flame Photometer | D. | All of these |
|  | MOP contains \_\_\_\_\_\_\_\_\_\_\_\_\_ K2O | | | | B |
| A. | 40 % | B. | 60 % |
| C. | 50 % | D. | None of the above |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a preferred source of potassium for potatoes. | | | | C |
| A. | KCl | B. | K2CO3 |
| C. | K2SO4 | D. | both a & b |
|  | Freezing and thawing is an important mechanism affecting \_\_\_\_\_\_\_\_ availability in many soils. | | | | B |
| A. | N | B. | K |
| C. | P | D. | S |
|  | Iron deficiency symptoms appear on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ leaves. | | | | B |
| A. | Older | B. | Younger |
| C. | Middle | D. | None of the above |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_availability increases with increasing pH in soil. | | | | D |
| A. | Phosphorus | B. | Sulfur |
| C. | Zinc | D. | Molybdenum |
|  | The conversion of humus into inorganic substances is called as \_\_\_\_\_\_\_ | | | | A |
| A. | Mineralization | B. | Immobilization |
| C. | Fixation | D. | None |
|  | Exchangeable and soluble K are termed as \_\_\_\_\_\_\_ | | | | C |
| A. | Fixed | B. | Adsorbed |
| C. | Available | D. | None of above |
|  | As pH decreases, \_\_\_\_\_\_\_\_\_\_\_ charges arise on exchange complex | | | | A |
| A. | Negative | B. | positive |
| C. | none | D. | remain changed |
|  | K fixation is more in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_soil | | | | B |
| A. | Sandy | B. | Clayey |
| C. | Gravelly | D. | None |
|  | Units of CEC is \_\_\_\_\_\_\_\_\_\_ | | | | B |
| A. | me % | B. | c mol (-) kg-1 |
| C. | both a & b | D. | none of the above |
|  | Phosphorus solubility is high in \_\_\_soil | | | | B |
| A. | Saline | B. | Sodic |
| C. | Saline-sodic | D. | None |
|  | Phosphorus deficiency in \_\_\_\_\_\_ may cause chalkiness problem | | | | A |
| A. | Rice | B. | Wheat |
| C. | Maize | D. | Sugercane |
|  | In vermicomposting ------------------------ are used | | | | D |
| A. | Bacteria | B. | Fungus |
| C. | Rodents | D. | Earthworm |
|  | De-calcification is the reaction in which \_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | CaCO3 is removed from the soil profile | B. | CaSO4 is removed from the soil profile |
| C. | Both a & b | D. | None |
|  | Upon dilution, pH of the soil will \_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Increase | B. | Decrease |
| C. | Remain unchanged | D. | none |
|  | The conversion of humus into inorganic substances is called as\_\_\_\_\_\_\_\_ | | | | A |
| A. | Mineralization | B. | Immobilization |
| C. | Fixation | D. | None |
|  | Extractable K and exchangeable are ----------------- | | | | B |
| A. | Similar | B. | Different |
| C. | Both are available | D. | None |
|  | Phosphorus fixation is more in \_\_\_\_\_\_\_\_\_\_\_ soils. | | | | A |
| A. | Calcareous | B. | Sandy |
| C. | Non-calcareous | D. | All the three |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_ is the most appropriate pH range for phosphorus availability to plants. | | | | B |
| A. | 4.5 – 5.5 | B. | 6.5 – 7.5 |
| C. | 4.5 – 7.5 | D. | None |
|  | Mycorrhizae is useful to enhance \_\_\_\_\_\_ availability to plant | | | | A |
| A. | Phosphorus | B. | Potassium |
| C. | Nitrogen | D. | Calcium |
|  | Phosphorus is a \_\_\_\_\_\_\_\_\_\_\_\_\_ element in soils. | | | | B |
| A. | Mobile | B. | Immobile |
| C. | Variable | D. | None of the above |
|  | Ammonia volatilization is more in \_\_\_\_\_\_\_\_\_\_\_\_\_ soils. | | | | D |
| A. | Alkaline | B. | Acidic |
| C. | Calcareous | D. | Both a & c |
|  | Ammonical form of nitrogen is mostly absorbed by plants through \_\_\_\_\_\_\_\_ mechanism | | | | A |
| A. | Diffusion | B. | Mass flow |
| C. | Root interception | D. | Both a and c |
|  | If CO2 is limiting but not the light then photosynthesis will be affected due to \_\_\_\_\_ | | | | B |
| A. | Light | B. | CO2 |
| C. | Temperature | D. | Other factors |
|  | Soil pH 8 indicates the more availability of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Mo | B. | Zn |
| C. | Fe | D. | Mg |
|  | Ability of a soil to resist a change in pH is called………………………………….. | | | | B |
| A. | Field capacity | B. | Buffering capacity |
| C. | Aggregation | D. | Acidification |
|  | Rice crop prefers \_\_\_\_\_\_\_\_\_\_\_\_\_ nitrogen form | | | | C |
| A. | NO2 | B. | NO3 |
| C. | NH4 | D. | None |
|  | To control the movement of nutrients inside the plant, \_\_\_\_\_\_\_\_\_\_ plays a role of traffic policeman in plant. | | | | B |
| A. | Ca | B. | K |
| C. | NH4 | D. | P |
|  | More than 90 % nitrogen is taken up by plant through \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Diffusion | B. | Root interception |
| C. | Mass flow | D. | Aerial |
|  | Principal source of charge in 2:1 and 2:1:1 type silicate minerals is | | | | A |
| A. | Isomorphic substitution | B. | pH – dependent |
| C. | Edge charges | D. | None of these |
|  | Nitrification process is associated with bacteria: | | | | A |
| A. | Nitrosomonas | B. | Rhizobium |
| C. | Bacillus | D. | Clostridium |
|  | Rice is tolerant to | | | | B |
| A. | Salinity | B. | Sodicity |
| C. | Both A & B | D. | None of these |
|  | Fresh organic residue on addition to a standing crop leads to: | | | | D |
| A. | Denitrification loss of soil nitrogen | B. | Decomposition of ammonia in soil |
| C. | Volatilization loss of nitrogen | D. | Immobilization of available nitrogen in soil |
|  | The macronutrient, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is important for the opening and closing of stomata. | | | | D |
| A. | Manganese | B. | Magnesium |
| C. | Iron | D. | Potassium |
|  | Symbiotic nitrogen fixation is associated with bacteria: | | | | A |
| A. | Rhizobium | B. | Nitrosomonas |
| C. | Bacillus | D. | Clostridium |
|  | Deflocculation in particle size analysis is carried out by means of a chemical ── | | | | C |
| A. | H2O2 | B. | Sodium bicarbonate |
| C. | Sodium Hexametaphosphate | D. | Calcium Hydroxide |
|  | Calcium is an essential plant nutrient because it is a component of \_\_\_\_\_\_ | | | | B |
| A. | Chlorophyll | B. | Cell wall |
| C. | Amino acids | D. | ADP & ATP |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | **Answer Key** |
|  | The distance between the closely attached cations on the exchange sites and the solid surface is called as ……….. | | | | C |
| A. | Thickness of DDL | B. | Diffused layer |
| C. | Stern layer | D. | Helmholtz layer |
|  | The drains passing by an industry carries the contaminants which can be categorized as…………... | | | | A |
| A. | Point sources | B. | non-point source |
| C. | heavy metals | D. | soluble salts |
|  | Increased concentration of phosphorus and aluminum in the fresh water cause a process called as ….. | | | | D |
| A. | Eutrophication | B. | Nitrification |
| C. | Precipitation | D. | None |
|  | Most of the pesticide molecules are ………………… in their nature which can be degraded with high temperature and microbial activity | | | | C |
| A. | Inorganic | B. | Chlorinated |
| C. | Organic | D. | None |
|  | ………………. Is the parameter for the evaluation of soil salinity of calcareous saline sodic soils | | | | A |
| A. | EC | B. | SAR |
| C. | ESP | D. | All |
|  | The water with high RSC values cause …………….. In the sandy clay loam soils | | | | D |
| A. | Salinity | B. | Sodicity |
| C. | Both | D. | None |
|  | If carbonates and bicarbonates in water will be high, it will directly affect ………..parameter of water | | | | A |
| A. | RSC | B. | SAR |
| C. | RCS | D. | SRE |
|  | The pH of the buffer used in Ca plus Mg had its pH ……………….. | | | | A |
| A. | > 10 | B. | < 10 |
| C. | > 7 | D. | < 7 |
|  | The EC of water, fit for irrigation is …………………….. dS cm-1 | | | | C |
| A. | 0.15 | B. | 1.5 |
| C. | 0.015 | D. | 20 |
|  | The EC meter can be standardized by calculating………………. | | | | C |
| A. | Standard curve | B. | Working standards |
| C. | Cell constant | D. | Buffer |
|  | On hydration, the size of the concerned ion will be ………………… | | | | C |
| A. | Decreased | B. | Unaffected |
| C. | Increased | D. | None |
|  | The EC of 0.01 N KCl solution is ………………………… dS m-1‑ at 25 C | | | | A |
| A. | 1.4118 | B. | 14.118 |
| C. | 141.18 | D. | 0.14118 |
|  | The exchange mechanism in soils is based on …………………. calculations | | | | A |
| A. | Stochiometric | B. | Non- Stochiometric |
| C. | Irreversible | D. | None |
|  | CEC in soil solution varies with the concentration in ………………………. | | | | A |
| A. | Bulk solution | B. | Stern layer |
| C. | Zeta potential | D. | Osmotic potential |
|  | The purpose of washing with ethanol is to remove………………. | | | | C |
| A. | Ca from the exchange sites | B. | Na from the exchange sites |
| C. | Entrapped Na | D. | Soluble Na |
|  | Ammonification is the process of conversion of amino acids into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_form of nitrogen | | | | C |
| A. | Nitrite | B. | Nitrate |
| C. | Ammonium | D. | Nitrous oxide |
|  | The ability of a soil to adsorb and exchange anions is | | | | B |
| A. | Cation exchange capacity | B. | Anion exchange capacity |
| C. | Buffering capacity | D. | Field capacity |
|  | The organic matter found in Pakistani soils is about | | | | A |
| A. | Less than 1% | B. | 5% |
| C. | 10% | D. | 50% |
|  | The basis of living matter is \_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Cell | B. | Energy |
| C. | DNA | D. | RNA |
|  | Bacteria those can tolerate dry conditions are called \_\_\_\_\_\_\_\_\_\_\_\_ | | | | D |
| A. | Osmotoleran | B. | Mesotolerant |
| C. | Desert bacteria | D. | Xerophites |
|  | \_\_\_\_\_\_\_\_\_\_\_\_ is the high energy phosphorus compound in the cell. | | | | A |
| A. | ATP | B. | ADP |
| C. | NAH | D. | NADPH |
|  | Rod shaped bacterial cells are called \_\_\_\_\_\_\_\_\_\_\_\_ | | | | D |
| A. | Cocci | B. | Gram positive |
| C. | Gram negative | D. | Bacilli |
|  | Inoculation of contaminated soil with microbes is called \_\_\_\_\_\_\_\_\_\_\_\_ | | | | C |
| A. | Bioventing | B. | Biostimulation |
| C. | Bioaugmentation | D. | Enrichment |
|  | \_\_\_\_\_\_\_\_\_\_\_\_ is process where gaseous stimulants are added during bioremediation. | | | | A |
| A. | Bioventing | B. | Biostimulation |
| C. | Bioaugmentation | D. | Bioradiation |
|  | Atrazine degradation is possible by \_\_\_\_\_\_\_\_\_\_\_\_ | | | | C |
| A. | Bioremediation | B. | Phytoremediation |
| C. | Bioremediation and Phytoremediation | D. | Bioreactors |
|  | \_\_\_\_\_\_\_\_\_\_\_\_has specific role in fruit ripening. | | | | A |
| A. | Ethylene | B. | Auxins |
| C. | Cytokinin | D. | Kinetin |
|  | Addation of organic matter in soil can help in decreasing the concentartion of \_\_\_\_\_\_\_\_\_\_\_\_ | | | | B |
| A. | Nitrogen | B. | Toxins |
| C. | Phosphorus | D. | Growth regulators |
|  | \_\_\_\_\_\_\_\_\_\_\_\_ is/are green house gases. | | | | D |
| A. | CO2 | B. | Methane |
| C. | Nitrous oxide | D. | CO2, methane and nitrous oxide |
|  | Eutrofication is a process where excessive \_\_\_\_\_\_\_\_\_\_\_\_enter in to water. | | | | C |
| A. | Pestisides | B. | Herbisides |
| C. | Nutrients | D. | Hormones |
|  | \_\_\_\_\_\_\_\_\_\_\_\_ is/are the primary causes of acid rain. | | | | A |
| A. | Sulfur dioxide and nitrogen oxide | B. | Carbon dioxide |
| C. | Carbon monoxide | D. | Hydrogen |
|  | Effect of acid rain is evaluated by measuring \_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | pH | B. | Redox potential |
| C. | Carbonic acid | D. | Hydrogen peroxide |
|  | With the increase of global warming sea level would \_\_\_\_\_\_\_\_\_\_\_\_ | | | | B |
| A. | Drop | B. | Rise |
| C. | Be unchanged | D. | Fluctuate |
|  | In soil competition exists among enormous variety of organism for \_\_\_\_\_\_\_\_\_\_\_\_ | | | | D |
| A. | Nitrogen | B. | Phosphorus |
| C. | Micronutrients | D. | All Nutrients |
|  | Which of the following statements is true? | | | | C |
| A. | Symbiosis refers to different organisms living together. | B. | Members of a symbiotic relationship cannot live without each other. |
| C. | Symbiosis refers to different organisms living together & benefiting from each other. | D. | A parasite is not in a symbiosis with its host. |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_soil is required for the functions of organisms. | | | | B |
| A. | Water logged | B. | Aerated |
| C. | Cultivated | D. | Salt affected soils |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is reduction of nitrate to gaseous products. | | | | A |
| A. | Denitrification | B. | Nitrification |
| C. | Mineralization | D. | Immobilization |
|  | After gram staining Gram-negative bacteria appear as \_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | Pink | B. | Green |
| C. | Yellow | D. | Colorless |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_is produced by a group of microbes known as methanogens. | | | | B |
| A. | Ethane | B. | Methane |
| C. | Ethylene | D. | Ethyl alcohol |
|  | Dilution plate technique is used to \_\_\_\_\_\_\_\_ bacteria. | | | | S |
| A. | Count | B. | Classify |
| C. | Identify | D. | Modify |
|  | Selective media contain ingredients which allow\_\_\_\_\_\_\_\_\_\_type of bacteria to grow. | | | | B |
| A. | All | B. | Specific |
| C. | Nitrogen fixing | D. | ACC deaminase |
|  | Use of N2 fixing crops also has the potential to reduce the contamination of ground water with \_\_\_\_\_\_\_ | | | | A |
| A. | Nitrate | B. | Ammonium |
| C. | Nitrites | D. | Aminoacids |
|  | Actinomycetes are usually found in \_\_\_\_\_\_\_\_\_\_ habitats. | | | | A |
| A. | Soil | B. | Freshwater |
| C. | Marine | D. | All of these. |
|  | Continuous feed during fermentation is used to maintain | | | | D |
| A. | Temperature | B. | Water level. |
| C. | Product concentration. | D. | Substrate concentration |
|  | Non-biological chemicals added in the environment are termed: | | | | B |
| A. | Antibiotics | B. | Xenobiotics |
| C. | Prebiotics | D. | Probiotics |
|  | \_\_\_\_\_\_\_\_\_\_\_\_ seem to be the most efficient at degradation of nonbiological chemicals. | | | | B |
| A. | Algae | B. | Fungi |
| C. | Bacteria | D. | Animals |
|  | Root nodule is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ structure. | | | | A |
| A. | Single cell | B. | Multicellular |
| C. | Bicellular | D. | Tricellular |
|  | Rhizosphere pH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | A |
| A. | May fluctuate | B. | Remain permanent |
| C. | Remain acidic | D. | Always basic |
|  | About 80 % P is transported from soil to root surface through | | | | A |
| A. | Diffusion | B. | Root Interception |
| C. | Mass flow | D. | Bulk flow |
|  | In acidic soils, P availability decreases due to adsorption and precipitation with | | | | C |
| A. | Organic matter | B. | 2:1 type clay minerals |
| C. | Fe/Al oxides | D. | CaCO3 |
|  | If a bag of fertilizer is labeled “23-19-17” , then it | | | | B |
| A. | contains 23% N, 19 % K, 17 % P | B. | contains 23% N, 19 % K2O, 17 % P2O5 |
| C. | 23 % of P, 19 % of K, and 17 % of plant N | D. | none of these |
|  | An essential plant nutrient is defined as | | | | A |
| A. | An element which a plant must have in order to complete its life cycle. | B. | Anything which the plant takes up from the soil |
| C. | nutrients which animals get when they eat plants | D. | all of the above |
|  | Which three of the essential elements do plants get primarily from water and air? | | | | B |
| A. | C, O, N | B. | O, H, C |
| C. | O, H, N | D. | none of the above |
|  | Which three macronutrients are included in a so called "complete fertilizer? | | | | B |
| A. | N, P, Ca. | B. | N, K, P |
| C. | P, K, S | D. | all of the above |
|  | Which of the following is not an essential plant nutrient? | | | | D |
| A. | Molybdenum | B. | Copper |
| C. | Chloride | D. | Cadmium |
|  | DAP is a fertilizer source for | | | | C |
| A. | Nitrogen | B. | Phosphorus |
| C. | Both a & b | D. | none of these |
|  | There will be more fixations of P in soils having larger amounts of | | | | A |
| A. | Clay | B. | Silt |
| C. | Sand | D. | all the three |
|  | Phosphorus availability in most of the soils is in the pH range | | | | A |
| A. | 5.5-6.5 | B. | 6.5-8.5 |
| C. | 3.5-5.5 | D. | 5.5-7.5 |
|  | It is also termed as “muriate of potash” | | | | B |
| A. | K2SO4 | B. | KCl |
| C. | KH2PO4 | D. | none of these |
|  | Nutrients which are required by plants in larger amounts are termed as | | | | C |
| A. | Micronutrients | B. | Beneficial nutrients |
| C. | Macronutrients | D. | None |
|  | Elements which are essentially required for all plants are | | | | C |
| A. | 9 | B. | 16 |
| C. | 17 | D. | 19 |
|  | In the presence of chlorophyll, simple sugars are synthesized from | | | | D |
| A. | Carbon | B. | Hydrogen |
| C. | Oxygen | D. | All the three |
|  | Delayed crop maturity is usually caused by too much | | | | A |
| A. | Nitrogen | B. | Phosphorus |
| C. | Potassium | D. | None of these |
|  | To convert P to P2O5 multiply by | | | | A |
| A. | 2.29 | B. | 1.2 |
| C. | 0.43 | D. | 0.8 |
|  | Sulfate of potash has K2O | | | | A |
| A. | 50 % | B. | 40 % |
| C. | 60 % | D. | 45 % |
|  | In flooded rice soils, best source of N is | | | | D |
| A. | Ammonium sulfate | B. | Urea |
| C. | DAP | D. | all the three |
|  | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | **Answer Key** |
|  | Thiourea is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_type of fertilizer? | | | | D |
| A. | Slow release | B. | Nitrification inhibitor |
| C. | Natural Nitrification inhibitor | D. | Artificial Nitrification inhibitor |
|  | Which organism derive their energy from oxidation of complex organic compounds? | | | | A |
| A. | Heterotrophs | B. | Autotrophs |
| C. | Chemotrophs | D. | Lithotrophs |
|  | Some irrigation systems have stimulated the formation of saline and saline-sodic soils. Which of the following contributes to this process? | | | | C |
| A. | The low sodium adsorption ratio in the irrigation water | B. | High Ca and Mg contents in the irrigation water |
| C. | Inadequate drainage systems to remove soluble salts | D. | High contents of sulfates and chlorides in the irrigation water |
|  | Available phosphorus levels are constrained in alkaline and salt-affected soils because of \_\_\_\_\_. | | | | C |
| A. | High iron and aluminum levels | B. | High exchangeable sodium levels |
| C. | High calcium and magnesium levels | D. | High manganese levels |
|  | Attempts to leach the excess salts from a saline-sodic soil resulted in a marked reduction of crop yields. To what is this most likely due? | | | | B |
| A. | Deficiency of iron and manganese | B. | Increase in percentage sodium saturation |
| C. | Removal of Ca2+ and Mg2+ ions from the exchange complex | D. | Increase in the soil pH |
|  | Which of the following comparisons of the three different classes of salt-affected soils is correct? | | | | D |
| A. | Sodic soils generally have the highest EC levels | B. | The pH of saline soils is generally above 8.5. |
| C. | Saline soils are generally higher in soluble salts than saline-sodic soils. | D. | Sodic soils are commonly formed by leaching saline-sodic soils. |
|  | The growth of plants on sodic soils is constrained by all but one of the following | | | | D |
| A. | Caustic influence of high pH caused by sodium carbonate and bicarbonate | B. | Low micronutrient availability due to high ph |
| C. | Oxygen deficiency due to breakdown of soil structure | D. | Toxicity of very high levels of calcium carbonate |
|  | Ammonia losses are likely to be greatest if a nitrogen source is placed about 10 cm deep in \_\_\_\_ | | | | B |
| A. | An acid, sandy loam soil | B. | A calcareous sandy loam soil |
| C. | An acid, clay loam soil | D. | A calcareous clay loam soil |
|  | To be practical, a nitrification inhibitor should kill or inhibit | | | | A |
| A. | Nitrosomonas | B. | Nitrobacter |
| C. | Either A or B | D. | None of the above |
|  | A pesticide is more likely to contaminate groundwater if it has which of the following characteristics? | | | | B |
| A. | Highly volatile (high vapor pressure) | B. | Highly soluble in water |
| C. | Strongly adsorbed to soil colloids | D. | Rapidly degraded by soil microorganisms |
|  | Maintaining soil reaction at pH 7.0 is likely to virtually eliminate any significant \_\_\_\_\_\_\_ by heavy metals applied to soils with sewage sludge. | | | | D |
| A. | Plant uptake | B. | Leaching |
| C. | Adsorption | D. | A and B |
|  | Which of the following contributes most positively to soil quality? | | | | B |
| A. | Monoculture cropping systems | B. | Combinations of organic and inorganic inputs |
| C. | High N and P fertilizer inputs | D. | Using irrigation to raising the water table in dry regions |
|  | The water in the soil typically differs from pure water because the soil water \_\_\_\_\_\_\_\_. | | | | D |
| A. | Contains organic compounds | B. | Contains mineral nutrients |
| C. | Is restrained in its flow by attraction to particle surfaces | D. | All of the above |
|  | In many soil profiles, the subsoil is high in clay, but is also quite permeable to percolating water. Why? | | | | C |
| A. | Clay generally promotes free water movement. | B. | The subsoil may have an organic texture |
| C. | Prismatic structure may be well developed | D. | The water table may be present in the subsoil |
|  | The matric potential of soil water is \_\_\_\_\_? | | | | B |
| A. | Influenced greatly by the content of salts in the soil | B. | Not influenced appreciably by the force of gravity |
| C. | Is generally higher than that of pure water outside the soil | D. | Is little affected by soil solids |
|  | Which of the following best characterizes the field capacity of a soil? | | | | B |
| A. | Maximum capacity of a soil to hold water | B. | Water content of a soil with water potential of about -10 kpa |
| C. | the total capillary water in a soil | D. | A wetted soil prior to the removal of the gravitational water |
|  | Soils high in organic matter commonly hold more available water than comparable soils with lower organic matter levels. This is most likely due to what characteristics of the high O.M. soils | | | | C |
| A. | Larger micro pore space | B. | Lower permanent wilting percentage |
| C. | Higher field capacity | D. | Higher capacity of the O.M. to hold water tightly |
|  | Soils rich in which type of clay would provide the most troublesome site on which to build a home? | | | | D |
| A. | Fe, Al oxides | B. | Mica |
| C. | Kaolinite | D. | Smectite |
|  | Anion exchange by formation of outer sphere complexes is of least importance in the plant absorption of \_\_\_\_\_. | | | | D |
| A. | NO3 | B. | Cl- |
| C. | SO4 | D. | H2PO4 |
|  | Humus is an important soil colloid. It differs from 2:1 type mineral in all but one of the following characteristics (select the one). | | | | D |
| A. | Structural framework of the particles | B. | CEC dependence on soil pH |
| C. | Influence of isomorphous substitution | D. | Capable of adsorbing cations |
|  | Compared to silt, clay-sized soil particles are characterized by \_\_\_\_\_\_. | | | | A |
| A. | Greater attraction for water | B. | Greater proportion of primary minerals |
| C. | Less tendency to form hard clods when dry | D. | Less capacity to hold nutrients in plant available forms |
|  | Secondary minerals are most prominent in the fraction of soils | | | | D |
| A. | Organic | B. | Sand |
| C. | Silt | D. | Clay |
|  | Which of the following is not a textural class name? | | | | C |
| A. | Sand | B. | Clay |
| C. | Sandy silt | D. | Loam |
|  | A landscaping contractor wants to change the texture of a silt loam soil to meet the specifications for a loam. S/he would most likely do so by adding \_\_\_\_\_\_ to the soil and mixing it well. | | | | D |
| A. | Humus | B. | Compost |
| C. | Clay | D. | Sand |
|  | Unsaturated water flow ------------------------ | | | | D |
| A. | Is faster than saturated flow | B. | Is stimulated by the osmotic potential |
| C. | Is driven primarily by the force of gravity | D. | Occurs on soils that are at field capacity |
|  | In which of the following situations would you expect downward movement of soil water through the profile to be most rapid? | | | | A |
| A. | Uniformly textured sandy loam profile | B. | Clay texture throughout the profile |
| C. | Sandy loam in upper layers with a clay band underneath | D. | Silt loam in upper layers underlain by a sandy layer |
|  | Which of the following processes are most apt to encourage good soil aeration? | | | | B |
| A. | Root respiration | B. | Creation of more macropores |
| C. | Organic matter decomposition | D. | Reaction of oxygen with Organic matter |
|  | An alkaline soil contains 20% clay and 3% humus. If the pure clay has a CEC of 40 cmolc/kg and the humus 200 cmolc/kg, calculate the CEC/kg of the soil. | | | | D |
| A. | 8 | B. | 30 |
| C. | 12 | D. | 14 |
|  | Which of the silicate clays would likely have the highest level of potassium in the crystal structure? | | | | C |
| A. | Kaolinite | B. | Chlorite |
| C. | Fine grained mica | D. | Vermiculite |
|  | Which of the following human actions is most apt to result in a long-term increase in soil ph? | | | | C |
| A. | Application of ammonium containing fertilizers | B. | Application of farm manure |
| C. | Irrigation with high sodium salt containing waters | D. | Emission of gases from automobiles |
|  | An acid soil is known to contain toxic quantities of a certain plant nutrient. Which of these essential elements is it most likely to be? | | | | C |
| A. | Nitrogen | B. | Molybdenum |
| C. | Manganese | D. | Boron |
|  | You were advised to use elemental sulfur in the reclamation of a saline-sodic soil. Indicate how the sulfur helps bring about this reclamation. | | | | C |
| A. | Sulfur leaches down into the soil and increases the soil ph | B. | Sulfur is oxidized to sulfates that will precipitate much of the exchangeable Na |
| C. | Sulfur is oxidized and forms sulfuric acid which, in turn, removes the exchangeable Na+ | D. | Sulfur stimulates the formation of gypsum in the soil. |
|  | Which of the following pools contain the largest amount of the world's carbon? | | | | A |
| A. | Soil | B. | Vegetation |
| C. | Atmosphere | D. | Animals |
|  | The great majority of nitrogen (95 to 98%) in soils can be found in the form of \_\_\_\_\_. | | | | D |
| A. | Primary minerals | B. | Secondary minerals |
| C. | Dissolved cations | D. | Organic compounds |
|  | Ammonium fixation would be expected to be greatest in soils containing a lot of\_\_\_\_\_\_. | | | | B |
| A. | Rhizobium bacteria | B. | Vermiculite |
| C. | Iron oxides | D. | Frankia |
|  | In acid soils the principal chemical form of phosphorus available for plant uptake is \_\_\_\_ | | | | C |
| A. | P2o5 | B. | P3+ |
| C. | H2po4- | D. | Hpo42- |
|  | The sites in certain clay minerals which fix potassium ions are also capable of fixing which other ion? | | | | C |
| A. | No3- | B. | H2po4- |
| C. | Nh4+ | D. | Ca2+ |
|  | Which of the following nutrient elements is usually present in the soil solution as an undissociated acid? | | | | A |
| A. | B | B. | Zn |
| C. | Cu | D. | Fe |
|  | Which of the following micronutrients is least commonly found to be deficient in plants? | | | | D |
| A. | Manganese | B. | Copper |
| C. | Iron | D. | Chlorine |
|  | Plants that are efficient at taking iron up from a calcareous soil are known to employ which of the following methods? | | | | D |
| A. | Lower ph of their rhizosphere | B. | Produce organic compounds that can form stable chelates with iron. |
| C. | Produce reducing agents that reduce Fe3+ to Fe2+ in the rhizosphere. | D. | All of the above |
|  | Methemoglobinemia is principally a potential threat to \_\_\_\_\_. | | | | B |
| A. | Babies drinking water high in sulfate | B. | Babies drinking water high in nitrate |
| C. | Adults drinking water high in sulfate | D. | Adults drinking water high in nitrate |
|  | In the early stages of plant nitrogen deficiency, the most obvious symptoms are \_\_\_\_\_. | | | | D |
| A. | Yellowing of the youngest leaves | B. | Purpling of the youngest leaves |
| C. | Brown spots and tiny holes on the underside of most leaves | D. | Yellowish colors in the oldest leaves |
|  | When fresh plant residues are added to soils, the "priming effect" may result in the decomposition of \_\_\_\_\_\_\_. | | | | A |
| A. | Stable humus | B. | Sugars and starch |
| C. | Waxes and fats | D. | Lignin and cellulose |
|  | The active fraction of soil organic matter largely accounts for which of the benefits of adding organic matter to soils? | | | | D |
| A. | Increased CEC | B. | Increased water holding capacity |
| C. | Increased microbial activity | D. | All of the above |
|  | One would expect well drained soils to have the highest organic matter contents where the climate is \_\_\_\_\_\_\_. | | | | D |
| A. | Warm and dry | B. | Cool and dry |
| C. | Warm and humid | D. | Cool and humid |
|  | Non-humic substances consist of \_\_\_\_. | | | | C |
| A. | Living organisms and cells | B. | Dead tissues and wastes |
| C. | Identifiable biomolecules | D. | Polymerized, non-identifiable molecules |
|  | In most soils the overall population (numbers) of microorganisms changes with time, generally following changes in the \_\_\_\_\_. | | | | A |
| A. | Supply of decomposable organic matter | B. | Pore space |
| C. | Supply of oxygen | D. | Availability of root infection sites |
|  | Some soil colloids exhibit positive charges under highly acid conditions. To what are these charges likely due? | | | | A |
| A. | Protonation of some hydroxy groups by excess H+ ions | B. | The release of some OH- ions leaving an unsatisfied positive charge on the colloid |
| C. | The adsorption of Al3+ ions on the colloid | D. | Substitution of lower valent atoms for higher valent atoms in the octahedral sheet |
|  | The swelling/shrinking tendency of some silicate clay minerals is due primarily to \_\_\_\_\_ | | | | C |
| A. | The presence of cations attracted by the negative charges on the internal surfaces | B. | Expansion in the width of the interlayers due to movement of larger ions such as k |
| C. | The movement of water molecules in and out of the interlayers of the crystal | D. | Varying thickness of the film of water covering the external surface of the particles |
|  | The electronegative charge on 2:1 type silicate clays is due primarily to \_\_\_\_\_. | | | | C |
| A. | Ionization of surface OH groups | B. | Extremely small size of the individual colloid particles |
| C. | Substitution of one metallic atom for another in the crystal structure of the clay | D. | The effect of ph on the presence of h+ ions in the exchange complex |
|  | If you were seeking a soil colloid with a high capacity to adsorb cationic pollutants, but also with a consistent capacity to do so even as the ph varied form 4.0 to 7.5, which of the following would you choose? | | | | A |
| A. | Montmorillonite | B. | Kaolinite |
| C. | Fine grained mica | D. | Chlorite |
|  | Which of the following is not a characteristic of soil colloids? | | | | C |
| A. | Very small size | B. | High external surfaces |
| C. | Low water holding capacity | D. | Ability to exchange ions with the soil solution |
|  | At which of the following soil moisture potentials (expressed as kpa) is the soil water held most tightly? | | | | C |
| A. | +5 | B. | 0 |
| C. | -3100 | D. | -1500 |
|  | A soil pedon is \_\_\_\_. | | | | B |
| A. | A category of Soil Taxonomy | B. | A diagnostic subsurface horizon prominent in arid regions and in sandy parent materials. |
| C. | A three-dimensional unit that embodies the primary characteristics of an individual soil | D. | Generally larger in area than a polypedon |
|  | Mechanical weathering processes result in | | | | B |
| A. | The decomposition of primary minerals | B. | The disintegration of rocks due to differential expansion of minerals |
| C. | The hydrolysis of minerals through frost action | D. | The oxidation of iron and manganese compounds |
|  | Which of the following is not considered one of the major factors influencing soil formation? | | | | C |
| A. | Native parent material | B. | Living organism |
| C. | Valence state | D. | Topography |
|  | For which substance would the particle density equal the bulk density? | | | | C |
| A. | An organic soil | B. | A well-aggregated surface soil |
| C. | A quartz pebble | D. | A wet soil |
|  | Practices that add organic matter and reduce tillage can be expected to most significantly increase the \_\_\_\_\_ in a soil. | | | | B |
| A. | Total porosity | B. | Macropores |
| C. | Fineness of texture | D. | Bulk density |
|  | Soil tilth refers to \_\_\_\_\_. | | | | C |
| A. | Micro-aggregates produced as a by-product of tillage | B. | The bearing strength of a soil under a given downward force |
| C. | The physical suitability of a soil for plant growth | D. | The moisture content at which a soil is best suited for tillage |
|  | Capillarity in soils \_\_\_\_\_. | | | | A |
| A. | Involves both adhesion and cohesion | B. | Is independent of the matric potential in soils |
| C. | Is enhanced by the symmetrical nature of the water molecule | D. | Is not involved in the process of water uptake from soils |
|  | The likelihood of polluting groundwater with pesticides and plant nutrients is enhanced by \_\_\_\_\_. | | | | A |
| A. | The presence of macropores in the soil | B. | The use of tillage to control weeds |
| C. | Light tillage of the upper centimeter or so of soil | D. | Conventional tillage as a choice compared with conservation tillage |
|  | Which of the following irrigation systems produces the most biomass per unit of water applied? | | | | C |
| A. | Flood irrigation | B. | Furrow irrigation |
| C. | Drip irrigation | D. | Sprinker irrigation |
|  | Which group of soil organisms includes the largest number of autotrophic species? | | | | A |
| A. | Bacteria | B. | Fungi |
| C. | Actinomycetes | D. | Protozoa |
|  | Oxidation or reduction of inorganic soil constituents such as iron and sulfur is carried out by members of which group(s) of microorganisms | | | | C |
| A. | Actinomycetes | B. | A and C |
| C. | Bacteria | D. | Fungi |
|  | Disease suppressive soil often results from \_\_\_\_\_. | | | | A |
| A. | Adding organic materials to the soil that stimulate diverse microorganisms. | B. | Fumigation with a volatile chemical. |
| C. | Repeated tillage to keep the soil bare for at least one full year | D. | Heating the soil by natural solarization or steam heat. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subject (1-65) MCQ’s** | | | | | **Answer Key** |
|  | \_\_\_\_\_is not a type of bioremediation | | | | Biometrics |
| A. | Biostimulation | B. | Bioaugmentation |
| C. | Bioventing | D. | Biometrics |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ means the water table of saturated layer of soil which is separated from an underlying saturated layer by an unsaturated layer | | | | Perched water table |
| A. | high water table | B. | Perched water table |
| C. | low water table | D. | none of the above |
|  | \_\_\_\_\_\_\_\_\_\_\_ shows the correction factor b/w activity and concentration | | | | Activity coefficient |
| A. | Activity coefficient | B. | Concentration coefficient |
| C. | Permeability coefficient | D. | None of the above |
|  | \_\_\_\_\_\_\_\_\_\_ is a rich source of K in Pakistani soils | | | | Mica |
| A. | Chlorite | B. | Vermiculite |
| C. | Mica | D. | All of them |
|  | \_\_\_\_\_\_\_\_\_ is an inert gas in the environment | | | | Ar |
| A. | N2O | B. | CO2 |
| C. | Ar | D. | CH4 |
|  | Adequate supply of Boron can be a substitute of: | | | | None of the above |
| A. | Zn deficiency | B. | Fe deficiency |
| C. | P starvation | D. | None of the above |
|  | Adsorption is \_\_\_\_\_\_\_\_\_\_\_ process | | | | Both a & b |
| A. | Physical | B. | Chemical |
| C. | Both a & b | D. | None |
|  | Ammonification is the enzymatic process responsible for conversion of | | | | Amino acids to NH4-N |
| A. | NO3-N to NH4-N | B. | NH4-N to NO3-N |
| C. | Amino acids to NH4-N | D. | None of the above |
|  | In SI system, the units of cation exchange capacity are \_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | cmol(+) kg-1 |
| A. | me 100g-1 | B. | cmol(+) kg-1 |
| C. | % | D. | mg kg-1 |
|  | At equivalent matric potential, a clayey soil retains \_\_\_\_\_\_\_\_\_\_\_\_\_amount of water than a sandy soil | | | | More |
| A. | More | B. | Less |
| C. | Equal | D. | None of these |
|  | Bacteria possess one or more small DNA molecules called | | | | Plasmids |
| A. | Ribosomes | B. | Inclusions |
| C. | Plasmids | D. | lamellae |
|  | Best response of phosphatic fertilizer application is obtained by | | | | Side dressing |
| A. | Broadcasting | B. | Side dressing |
| C. | Foliar spray | D. | None of the above |
|  | Boron and molybdenum are absorbed by plants as | | | | Anions |
| A. | Cations | B. | Anions |
| C. | Both cations and anions | D. | None of the above |
|  | Compared to that in plants and animals, connections of the network of endoplasmic reticulum with the cytoplasmic membrane in fungi are: | | | | Less |
| A. | Less | B. | More |
| C. | Equal | D. | none |
|  | Composting is a process of\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | Biological decomposition and stabilization of organic matter |
| A. | Biological decomposition and stabilization of organic matter | B. | Biological decay |
| C. | Simply decomposition | D. | None of these |
|  | Washing out of the soluble materials from the \_\_\_\_\_\_\_\_is called leaching | | | | Root zone |
| A. | Root zone | B. | Bulk soil |
| C. | Adjacent areas | D. | None of these |
|  | In Munsell colour system, the degree of lightness of a colour in relation to a neutral gray scale is referred by | | | | Value |
| A. | Neutral | B. | Hue |
| C. | Value | D. | Chroma |
|  | Which mineral has the highest CEC? | | | | vermiculite |
| A. | kaolinite | B. | chlorite |
| C. | illite | D. | vermiculite |
|  | For monovalent ions | | | | Molarity is equal to normality |
| A. | Molarity is less than normality | B. | Molarity is greater than normality |
| C. | Molarity is equal to normality | D. | Molarity is double of the normality |
|  | Which of the following nutrient replenish the soil after growing leguminous plants? | | | | Nitrogen |
| A. | Nitrogen | B. | Oxygen |
| C. | Phosphorus | D. | Potassium |
|  | Which produce acid by living on rocks | | | | All of these |
| A. | Lichen | B. | Protozoa |
| C. | Micro-organism | D. | All of these |
|  | Which scientist is most responsible for finally settling the issue of spontaneous generation | | | | Pasteur |
| A. | Lister | B. | Koch |
| C. | Redi | D. | Pasteur |
|  | Zn, Cu, Fe and Mn are termed as | | | | Micro nutrients |
| A. | Macro nutrients | B. | Micro nutrients |
| C. | Non-metal elements | D. | None of the above |
|  | Denitrification is | | | | Dissimilatory nitrate reduction |
| A. | Assimilatory nitrate reduction | B. | Dissimilatory nitrate reduction |
| C. | Both a & b | D. | None of all these |
|  | Excess nitrogen application can result in: | | | | Lodging and disease attack |
| A. | Early maturity | B. | Good quality |
| C. | Lodging and disease attack | D. | None of the above |
|  | Due to strong di-pole moment water is very\_\_\_\_\_\_\_\_\_\_\_\_\_ ionized | | | | weakly |
| A. | Strongly | B. | intermediately |
| C. | weakly | D. | Very weakly |
|  | Which law follows the heat flow through soil? | | | | Fourier’s Law |
| A. | Fick’s Law | B. | Darcy’s Law |
| C. | Ohm’s Law | D. | Fourier’s Law |
|  | For a crop having nitrogen requirement of 46 kg/ha, the amount of urea needed is | | | | 2 bags |
| A. | ½ bag | B. | 1 bag |
| C. | 2 bags | D. | 4 bags |
|  | For K determination from fertilizer, soil and plant sample, we can use: | | | | Flame photometer |
| A. | Spectrophotometer | B. | Flame photometer |
| C. | FTIR | D. | All of the above |
|  | For the development of pollen tube essentially there should be sufficient: | | | | Boron |
| A. | Copper | B. | Phosphorus |
| C. | Boron | D. | None of the above |
|  | In cation exchange process one Ca2+ can be replaced by | | | | one K and one Na |
| A. | one K and one Na | B. | One NH4+ |
| C. | one Mg2+ and one K | D. | None |
|  | In \_\_\_\_\_\_\_ areas salts accumulate at the soil surface. | | | | Arid and semi-arid |
| A. | Humid | B. | Sub-humid |
| C. | Tropical | D. | Arid and semi-arid |
|  | High RSC waters can cause | | | | Dispersion |
| A. | Soil flocculation | B. | Dispersion |
| C. | Aggregation | D. | Salinization |
|  | Basic cation saturation percentage is | | | | (sum of basic cations /CEC) X100 |
| A. | (sum of total cations /CEC) X100 | B. | (sum of basic cations /sum of acidic cations) X100 |
| C. | (sum of basic cations /CEC) X100 | D. | None |
|  | Lebig’s law of minimum states that plant or crop yield is | | | | Limited to a point |
| A. | Limited to a point | B. | Logarithmic |
| C. | Correlated | D. | Exponential |
|  | Monohydrated Zinc sulfate ( ZnSO4.H2O) contains % Zn | | | | 33 |
| A. | 33 | B. | 22 |
| C. | 18 | D. | 5 |
|  | Water is said to be fit for irrigation if its EC (dS m-1) is | | | | < 1.25 |
| A. | < 2.5 | B. | < 1.25 |
| C. | 8 | D. | < 13 |
|  | A profitable use of salt affected lands by growing salt tolerant plants is called | | | | Saline agriculture |
| A. | Saline agriculture | B. | Soil chemistry |
| C. | Soil physics | D. | Microbiology |
|  | A compound toxic to some crops formed by thermal decomposition of urea is called | | | | Biuret |
| A. | Thiourea | B. | Biuret |
| C. | S–coated urea | D. | None of the above |
|  | Corrosion is | | | | Ferric oxide |
| A. | Copper oxide | B. | Lead oxide |
| C. | Zinc oxide | D. | Ferric oxide |
|  | Potassium deficiency in crops can be removed by the application of | | | | SOP / MOP |
| A. | Urea | B. | DAP / SSP |
| C. | SOP / MOP | D. | All of the above |
|  | Pure free water has maximum potential, i.e. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and decreases with increase in solute concentration. | | | | Zero |
| A. | 10 k Pa | B. | Zero |
| C. | 20 k Pa | D. | – 10 k Pa |
|  | Silicate clays are also called as | | | | phylosilicates |
| A. | oligosilicates | B. | tentosilicates |
| C. | phylosilicates | D. | none of these |
|  | SO4-2 is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | Anions |
| A. | Anions | B. | Cations |
| C. | Molecules | D. | Neutral atoms |
|  | Sodic soils are also called: | | | | Black alkali |
| A. | Black alkali | B. | Grey alkali |
| C. | Calcareous | D. | Natric |
|  | Soil algae are | | | | Eukaryotic organisms |
| A. | Eukaryotic organisms | B. | Prokaryotic organisms |
| C. | Similar to bacteria | D. | Heterotrophs |
|  | Soluble form of selenium | | | | SeO42- |
| A. | Seo | B. | Se 2- |
| C. | SeO42- | D. | All these |
|  | The branch of soil science which deals with availability of nutrients and its management is called: | | | | Soil Fertility |
| A. | Soil Chemistry | B. | Soil Mineralogy |
| C. | Soil Fertility | D. | Soil Survey |
|  | The eutrophication that has taken place in the Gulf of Mexico and other locations appears to be due to \_\_\_\_\_\_\_\_ | | | | excess nutrients from fertilizers |
| A. | global warming from human use of fossil fuels | B. | pesticide use along the waterways |
| C. | heavy metals dumped in the sewage | D. | excess nutrients from fertilizers |
|  | The infiltration rate of a soil may be measured by using a simple device: | | | | Double ring infiltrometer |
| A. | Soil cone penetrometer | B. | Guelph permeameter |
| C. | Double ring infiltrometer | D. | Soil Tensiometers |
|  | The legal guarantee of the available plant food contents expressed as % is called | | | | Fertilizer grade |
| A. | Fertilizer formula | B. | Fertilizer grade |
| C. | Fertilizer value | D. | All of the above |
|  | The major reason for salinity in Pakistan is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | a and b |
| A. | Low rainfall | B. | High temperature |
| C. | Heavy rains | D. | a and b |
|  | The metal found in liquid form at normal temperature is | | | | Mercury |
| A. | Mercury | B. | Sodium |
| C. | Silver | D. | Bromine |
|  | The parameters used for determining fitness of irrigation water are \_\_\_\_\_\_\_\_\_\_ | | | | All of these |
| A. | TSS | B. | SAR |
| C. | RSC | D. | All of these |
|  | The potential effects of sodium are increased when irrigation water contains Ca: Mg of <\_\_\_\_\_\_ | | | | 1 |
| A. | 1 | B. | 2 |
| C. | 3 | D. | 4 |
|  | The quantity of heat required to convert one unit of a liquid to vapors is called as: | | | | heat of vaporization |
| A. | Specific heat | B. | heat energy |
| C. | heat of volatilization | D. | heat of vaporization |
|  | The saline soils are locally called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | Thur |
| A. | Thur | B. | Bara |
| C. | Thur-Bara | D. | Shor |
|  | The sodic soils are locally called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | Bara |
| A. | Thur | B. | Bara |
| C. | Thur-Bara | D. | Waterlogged |
|  | The type of interlayer bond in kaolinite is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | O-H-O |
| A. | O-K-O | B. | O-H-O |
| C. | O-Ca-Mg | D. | none of the above |
|  | To save soil from erosion is called | | | | Soil preservation |
| A. | Soil formation | B. | Soil erosion |
| C. | Soil preservation | D. | Soil pollution |
|  | Under irrigated conditions, all P and K fertilizer should be applied at: | | | | Sowing |
| A. | Sowing | B. | First irrigation |
| C. | Split application | D. | All of the above |
|  | Urea fertilizer is manufactured in Pakistan from | | | | Air and natural gas |
| A. | NH4NO3 and CO2 | B. | H2O and air |
| C. | Air and natural gas | D. | None of the above |
|  | Immobilization is the reverse mechanism of | | | | Mineralization |
| A. | Adsorption | B. | Mineralization |
| C. | Precipitation | D. | None |
|  | One mS cm-1 =\_\_\_\_\_\_\_\_ (dS m-1) | | | | 1 |
| A. | 1 | B. | 10 |
| C. | 100 | D. | none of the above |
|  | Total pore space in sandy soils will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_than clayey soils | | | | Less |
| A. | Less | B. | More |
| C. | Equal | D. | None of these |