CUET-UG Agriculture Sample Paper-19

Duration: 1 Hour **Maximum Marks: 250**

Instructions

- This paper contains a total of 50 Multiple Choice Questions.
- Each correct answer carries **+5 marks**.
- Each incorrect answer carries **-1 mark**.
- No negative marking for unattempted questions.

Q1. The phenomenon where a single gene influences multiple, seemingly unrelated phenotypic traits is known as:

(A) Polygenic inheritance

(B) Pleiotropy

(C) Co-dominance

(D) Incomplete dominance

Q2. Which specific technique in tissue culture is used to produce virus-free plants from an infected mother plant?

(A) Anther culture

(B) Meristem culture

(C) Embryo rescue

(D) Protoplast fusion

Q3. Which selection method is most commonly used for improving self-pollinated crops where individual plants are selected and their progeny is tested?

(A) Mass Selection

(B) Pure Line Selection

(C) Recurrent Selection

(D) Clonal Selection

Q4. In plant tissue culture, the mass of unorganized, undifferentiated cells produced on a nutrient medium is referred to as:

(A) Explant

(B) Callus

(C) Somatic embryo

(D) Protoplast

Q5. Enzymes act as biological catalysts by lowering which of the following factors in a chemical reaction?

(A) Free energy

(B) Activation energy

(C) Kinetic energy

(D) Potential energy

Q6. Which of the following vitamins is fat-soluble and plays a critical role in blood coagulation (clotting)?

(A) Vitamin C

(B) Vitamin B12

(C) Vitamin K

(D) Vitamin B1

Q7. Bacteria that possess a thick peptidoglycan layer in their cell wall and retain the crystal violet stain are classified as:

(A) Gram-negative

(B) Gram-positive

(C) Acid-fast

(D) Wall-less

Q8. Which group of soil microorganisms is primarily responsible for the characteristic 'earthy' smell of soil after rain and is known for producing antibiotics?

(A) Algae

(B) Protozoa

(C) Actinomycetes

(D) Viruses

Q9. The symbiotic nitrogen-fixing bacteria found in the root nodules of leguminous plants is:

(A) Azotobacter

(B) Rhizobium

(C) Nitrosomonas

(D) Clostridium

Q10. Which instrument is specifically used to measure the intensity of solar radiation reaching the Earth's surface?

(A) Anemometer

(B) Pyranometer

(C) Hygrometer

(D) Barometer

Q11. Medium-range weather forecasting, which is crucial for scheduling irrigation and pesticide application, covers a duration of:

(A) Less than 24 hours

(B) 1 to 2 days

(C) 3 to 10 days

(D) More than 30 days

Q12. In Genetics, Mendel's Law of Segregation states that during gamete formation, the alleles for each gene segregate from each other so that each gamete carries:

(A) Both alleles for a trait

(B) Only one allele for each gene

(C) Four alleles for each gene

(D) No alleles for any gene

Q13. The structure of DNA is a double helix where the two strands are held together by hydrogen bonds between complementary base pairs. Which base pairs with Guanine?

(A) Adenine

(B) Thymine

(C) Cytosine

(D) Uracil

Q14. Which of the following is a famous Indian milch breed of cattle known for its high resistance to diseases and heat tolerance?

(A) Holstein Friesian

(B) Sahiwal

(C) Jersey

(D) Brown Swiss

Q15. Identify the exotic poultry breed that is widely used for commercial egg production (layer) worldwide due to its high efficiency.

(A) Aseel

(B) Kadaknath

(C) White Leghorn

(D) Chittagong

Q16. The 'Jersey' breed of cattle, known for producing milk with high fat content, originated from which region?

(A) Switzerland

(B) Island of Jersey (UK)

(C) Netherlands

(D) India

Q17. In dairy farm management, a 'Balanced Ration' is defined as a feed that provides all essential nutrients in:

(A) Any quantity available

(B) Excess to ensure growth

(C) Proper proportion and amount for 24 hours

(D) Minimum possible amount to save costs

Q18. Which type of housing system for cattle allows animals to move freely within a fenced area and is considered cost-effective for large herds?

(A) Tail-to-tail system

(B) Head-to-head system

(C) Loose housing system

(D) Stanchion barn

Q19. What is the primary purpose of providing 'Colostrum' to a newborn calf immediately after birth?

(A) To increase body weight rapidly

(B) To provide passive immunity through antibodies

(C) To improve the color of the skin

(D) To reduce the need for water

Q20. Foot and Mouth Disease (FMD) in livestock is a highly contagious disease caused by which type of pathogen?

(A) Bacteria

(B) Virus

(C) Protozoa

(D) Fungus

Q21. Ranikhet disease, also known as Newcastle Disease, is a major threat in the poultry industry. It primarily affects which system of the bird?

(A) Digestive system only

(B) Respiratory and nervous systems

(C) Reproductive system only

(D) Integumentary system

Q22. Which of the following diseases, now largely eradicated globally, was characterized by high fever and severe erosive lesions in the digestive tract of cattle?

(A) Coccidiosis

(B) Black Quarter

(C) Rinderpest

(D) Anthrax

Q23. Coccidiosis in poultry is a parasitic disease that causes bloody diarrhea. It is caused by which of the following?

(A) Eimeria (Protozoa)

(B) Pasteurella (Bacteria)

(C) H5N1 (Virus)

(D) Aspergillus (Fungus)

Q24. In Artificial Insemination (AI), what is the most commonly used cryoprotectant for freezing bovine semen in liquid nitrogen?

(A) Distilled water

(B) Glycerol

(C) Sulphuric acid

(D) Alcohol

Q25. The process of heating milk to a specific temperature for a set time to kill pathogenic bacteria without affecting its nutritional value is called:

(A) Homogenization

(B) Sterilization

(C) Pasteurization

(D) Centrifugation

Q26. Which soil texture class is considered ideal for most agricultural crops due to its balanced water-holding capacity and aeration?

(A) Sandy soil

(B) Heavy Clay

(C) Loam

(D) Silt

Q27. A farmer observes that his soil pH is 4.5 (highly acidic). Which of the following soil amendments should be applied to neutralize the acidity?

(A) Gypsum

(B) Lime (Calcium carbonate)

(C) Urea

(D) Elemental Sulphur

Q28. In the NPK ratio for fertilizers, which nutrient is primarily responsible for vigorous vegetative growth and the dark green color of leaves?

(A) Phosphorus

(B) Potassium

(C) Nitrogen

(D) Zinc

Q29. Which of the following is classified as a complex fertilizer that provides both Nitrogen and Phosphorus to the plant?

(A) Muriate of Potash (MOP)

(B) Diammonium Phosphate (DAP)

(C) Single Super Phosphate (SSP)

(D) Calcium Ammonium Nitrate (CAN)

Q30. Which method of irrigation is considered the most efficient in terms of water-use efficiency (up to 90%) by delivering water directly to the root zone?

(A) Border strip irrigation

(B) Furrow irrigation

(C) Drip irrigation

(D) Check basin irrigation

Q31. The total amount of water needed by a crop in a given period to meet the requirements of evapotranspiration and metabolic activities is known as:

(A) Effective rainfall

(B) Water requirement

(C) Duty of water

(D) Consumptive use

Q32. What is the primary objective of providing a 'sub-surface drainage' system in agricultural fields?

(A) To increase the water table

(B) To remove excess soluble salts and prevent waterlogging

(C) To increase the surface runoff

(D) To store water for the dry season

Q33. Under Integrated Pest Management (IPM), 'Stale Seedbed' technique is a method used to reduce the weed seed bank. This falls under which category?

(A) Chemical control

(B) Biological control

(C) Cultural control

(D) Legislative control

Q34. Which of the following is a selective, systemic herbicide commonly used to control broad-leaved weeds in cereal crops like Wheat?

(A) Butachlor

(B) 2,4-D

(C) Paraquat

(D) Glyphosate

Q35. In Rice cultivation, the practice of 'Puddling' is done primarily to achieve which of the following?

(A) To increase soil porosity

(B) To reduce percolation losses of water and create an impervious layer

(C) To increase the population of aerobic bacteria

(D) To promote deep root penetration

Q36. The critical growth stage in Wheat for irrigation, where moisture stress leads to the highest yield loss, is:

(A) Jointing stage

(B) Flowering stage

(C) Crown Root Initiation (CRI) stage

(D) Dough stage

Q37. Which of the following millets is also known as 'Finger Millet' and is highly valued for its calcium content?

(A) Bajra (Pearl Millet)

(B) Jowar (Sorghum)

(C) Ragi

(D) Proso Millet

Q38. The 'Sett-prime' or 'Earthing up' operation in Sugarcane cultivation is performed mainly to:

(A) Promote flowering

(B) Prevent lodging of the heavy canes

(C) Induce dormancy

(D) Decrease the sugar content

Q39. In Precision Farming, which technology is primarily used to provide precise geographical locations for soil sampling and yield mapping?

(A) Remote Sensing

(B) Global Positioning System (GPS)

(C) Variable Rate Technology (VRT)

(D) Geographic Information System (GIS)

Q40. Which of the following is a key requirement for a farm to be certified as 'Organic' according to National Standards?

(A) Use of genetically modified seeds

(B) A mandatory conversion period of 2-3 years

(C) Exclusive use of urea for nitrogen

(D) Use of synthetic growth regulators

Q41. Zero Budget Natural Farming (ZBNF), popularized in India, emphasizes the use of which fermented microbial culture as a soil inoculant?

(A) NPK fertilizer

(B) Jeevamrutha

(C) Formaldehyde

(D) Copper Oxychloride

Q42. The 'Mango Malformation' is a serious disorder affecting mango production. Which of the following is widely used to manage its physiological aspects?

(A) Application of NAA (Naphthalene Acetic Acid)

(B) Excessive irrigation

(C) High doses of Nitrogen

(D) Pruning during peak summer

Q43. Citrus Canker, a major disease in citrus crops like Acid Lime, is caused by which of the following pathogens?

(A) Virus

(B) Fungus

(C) Xanthomonas (Bacteria)

(D) Mycoplasma

Q44. The 'Determinate' varieties of Tomato are characterized by which of the following growth habits?

(A) Continuous vine growth

(B) Bushy growth ending in a flower cluster

(C) Requirement of high staking

(D) Fruit ripening over a very long period

Q45. In Potato cultivation, the process of 'Earthing up' is crucial. What is the primary reason for this operation?

(A) To increase the height of the plant

(B) To prevent the exposure of tubers to light (greening)

(C) To reduce the starch content

(D) To promote flowering

Q46. Which method of vegetative propagation involves joining a 'Scion' from a desired variety onto a 'Rootstock' of a hardy variety?

(A) Air Layering

(B) Grafting

(C) Hardwood Cuttings

(D) Runners

Q47. In 'Air Layering' (Gooty), which material is commonly used to wrap the exposed branch to maintain moisture for root induction?

(A) Dry sand

(B) Sphagnum moss

(C) Sawdust

(D) Plastic beads

Q48. The 'T-Budding' (Shield Budding) method is most commercially successful and widely practiced in the propagation of which fruit crop?

(A) Banana

(B) Papaya

(C) Rose and Citrus

(D) Coconut

Q49. The 'Sheet Test' or 'Flake Test' is a common field method used to determine the end-point or readiness of which preserved product?

(A) Tomato Ketchup

(B) Fruit Jam

(C) Guava Jelly

(D) Mango Pickle

Q50. According to FPO (Fruit Products Order) specifications, what is the minimum required Total Soluble Solids (TSS) percentage for a product to be labeled as 'Jam'?

(A) 45%

(B) 65%

(C) 25%

(D) 10%

Detailed Solutions

Q1.

Solution

Concept: Gene expression can influence the phenotype in different ways. Some genes affect only one trait, while others can control multiple traits simultaneously due to their wide-ranging biochemical effects.

Solution: Pleiotropy is the phenomenon in which a single gene controls or influences multiple, seemingly unrelated phenotypic traits. This occurs because the gene product may participate in multiple biochemical pathways or affect a fundamental developmental process. Polygenic inheritance involves multiple genes controlling a single trait, while co-dominance and incomplete dominance describe patterns of allele expression rather than multiple trait effects. Therefore, pleiotropy is the correct answer.

Final Answer: Pleiotropy

Answer: (B)

Q2.

Solution

Concept: Plant tissue culture techniques are widely used for crop improvement and disease management. Some specialized methods help in eliminating pathogens, especially viruses, from infected plant material.

Solution: Meristem culture is the technique used to produce virus-free plants from infected mother plants. The apical meristem is typically free from viruses due to the lack of vascular connections, and when cultured in vitro, it can regenerate into healthy, disease-free plants. Anther culture is used for haploid production, embryo rescue is used for hybrid survival, and protoplast fusion is used for somatic hybridization. Therefore, meristem culture is the correct answer.

Final Answer: Meristem culture

Answer: (B)

Q3.

Solution

Concept: Plant breeding methods vary depending on the reproductive behavior of crops. Self-pollinated crops require methods that maintain genetic purity while improving desirable traits through selection.

Solution: Pure line selection is commonly used in self-pollinated crops. In this method, individual superior plants are selected from a population, and their progeny is tested over successive generations to obtain genetically uniform and stable lines. Mass selection does not involve progeny testing, recurrent selection is used in cross-pollinated crops, and clonal selection is used in vegetatively propagated crops. Therefore, pure line selection is the correct method.

Final Answer: Pure Line Selection

Answer: (B)

Q4.

Solution

Concept: Plant tissue culture is a biotechnology technique used to grow plant cells, tissues, or organs in a controlled artificial medium under sterile conditions.

Solution: In plant tissue culture, a callus is defined as an unorganized and undifferentiated mass of cells formed when plant tissues are cultured on a nutrient medium containing appropriate growth hormones. It serves as an intermediate stage for plant regeneration. An explant is the initial plant tissue taken for culture, somatic embryos are embryo-like structures formed from somatic cells, and protoplasts are plant cells without cell walls. Therefore, callus is the correct term.

Final Answer: Callus

Answer: (B)

Q5.

Solution

Concept: Enzymes are biological catalysts that speed up biochemical reactions by reducing the energy barrier required for the reaction to proceed. This makes metabolic processes more efficient in living organisms.

Solution: Enzymes function by lowering the activation energy of a chemical reaction. Activation energy is the minimum energy required to initiate a reaction. By reducing this energy requirement, enzymes allow reactions to occur faster without being consumed in the process. They do not change free energy, kinetic energy, or potential energy of the system directly. Therefore, activation energy is the correct answer.

Final Answer: Activation energy

Answer: (B)

Q6.

Solution

Concept: Vitamins are organic compounds required in small amounts for normal physiological functions. They are classified into fat-soluble and water-soluble vitamins, each with specific roles in the body.

Solution: Vitamin K is a fat-soluble vitamin that plays a crucial role in blood clotting by aiding the synthesis of clotting factors in the liver. Vitamin C is water-soluble and important for immunity, Vitamin B12 is involved in red blood cell formation, and Vitamin B1 supports energy metabolism. Therefore, Vitamin K is the correct answer for blood coagulation.

Final Answer: Vitamin K

Answer: (C)

Q7.

Solution

Concept: Bacteria are classified using the Gram staining technique based on differences in their cell wall structure, particularly the thickness of the peptidoglycan layer.

Solution: Gram-positive bacteria have a thick peptidoglycan layer in their cell wall, which retains the crystal violet stain during Gram staining, appearing purple under the microscope. Gram-negative bacteria have a thin peptidoglycan layer and do not retain the stain. Acid-fast bacteria have waxy cell walls, and wall-less bacteria lack a cell wall entirely. Therefore, bacteria retaining crystal violet stain are Gram-positive.

Final Answer: Gram-positive

Answer: (B)

Q8.

Solution

Concept: Soil microorganisms play an important role in decomposition of organic matter and production of biologically active compounds. Some groups are also responsible for characteristic soil properties such as smell and fertility enhancement through bioactive substances.

Solution: Actinomycetes are filamentous, bacteria-like soil microorganisms that produce geosmin, which is responsible for the characteristic earthy smell of soil after rainfall. They are also well known for producing a wide range of antibiotics such as streptomycin, making them highly significant in both agriculture and medicine. Algae and protozoa do not produce antibiotics or soil odor, while viruses are not responsible for soil smell. Therefore, actinomycetes are the correct answer.

Final Answer: Actinomycetes

Answer: (C)

Q9.

Solution

Concept: Biological nitrogen fixation is a key process in agriculture where certain microorganisms convert atmospheric nitrogen into plant-usable forms, improving soil fertility and crop productivity.
Solution: Rhizobium is a symbiotic nitrogen-fixing bacterium that lives in the root nodules of leguminous plants such as peas, gram, and lentils. It converts atmospheric nitrogen into ammonia, which plants can utilize for growth. Azotobacter is free-living, Nitrosomonas is involved in nitrification, and Clostridium is an anaerobic bacterium not typically associated with legume nodules. Therefore, Rhizobium is the correct organism.
Final Answer: Rhizobium

Answer: (B)

Q10.

Solution

Concept: Meteorological instruments are designed to measure specific atmospheric parameters such as wind speed, humidity, pressure, and solar radiation. These measurements are essential in agriculture and climate studies.
Solution: A pyranometer is the instrument used to measure the intensity of solar radiation received on the Earth's surface. It is widely used in agriculture, meteorology, and solar energy research. An anemometer measures wind speed, a hygrometer measures humidity, and a barometer measures atmospheric pressure. Therefore, pyranometer is the correct instrument.
Final Answer: Pyranometer

Answer: (B)

Q11.

Solution

Concept: Weather forecasting is categorized based on time duration. Medium-range forecasts are particularly useful in agriculture for planning irrigation, spraying, and other field operations.
Solution: Medium-range weather forecasting refers to predictions made for a period of 3 to 10 days. This type of forecast provides sufficient time for farmers to plan agricultural operations such as irrigation scheduling and pesticide application. Short-range forecasts cover less than 3 days, while long-range forecasts extend beyond 30 days. Therefore, 3 to 10 days is the correct duration.
Final Answer: 3 to 10 days

Answer: (C)

Q12.

Solution

Concept: Mendel's laws of inheritance describe how traits are passed from parents to offspring. The Law of Segregation explains the behavior of alleles during gamete formation.

Solution: According to Mendel's Law of Segregation, during gamete formation, the two alleles for a gene separate so that each gamete carries only one allele for each gene. This ensures genetic variation in the offspring after fertilization. Gametes do not carry both alleles, multiple alleles, or no alleles. Therefore, each gamete carries only one allele for each gene.

Final Answer: Only one allele for each gene

Answer: (B)

Q13.

Solution

Concept: DNA is composed of two complementary strands held together by specific hydrogen bonding between nitrogenous bases. These base pairings ensure accurate replication and genetic stability in living organisms.

Solution: In DNA, guanine (G) always pairs with cytosine (C) through three hydrogen bonds, forming a strong and stable complementary base pair. Adenine pairs with thymine, while uracil is found only in RNA and not in DNA. Therefore, among the given options, cytosine is the correct base that pairs with guanine.

Final Answer: Cytosine

Answer: (C)

Q14.

Solution

Concept: Dairy cattle breeds are classified based on milk production, adaptability, and disease resistance. Indian indigenous breeds are well adapted to tropical climates and often show better resistance to heat and local diseases.

Solution: Sahiwal is one of the best Indian milch cattle breeds known for high milk production, heat tolerance, and strong resistance to diseases. It is widely used in dairy farming in tropical regions. Holstein Friesian and Jersey are exotic breeds with high milk yield but lower heat tolerance compared to indigenous breeds. Brown Swiss is also an exotic breed. Therefore, Sahiwal is the correct answer.

Final Answer: Sahiwal

Answer: (B)

Q15.

Solution

Concept: Poultry breeds are selected based on their utility such as egg production (layers), meat production (broilers), dual-purpose use, or ornamental value. Exotic breeds are often used in commercial production systems.

Solution: White Leghorn is a highly efficient exotic poultry breed widely used for commercial egg production due to its high laying capacity, feed efficiency, and adaptability. Aseel is mainly used for game purposes, Kadaknath is known for its black meat and dual-purpose use, and Chittagong is an indigenous breed with ornamental and dual-purpose characteristics. Therefore, White Leghorn is the correct answer.

Final Answer: White Leghorn

Answer: (C)

Q16.

Solution

Concept: Cattle breeds are often classified based on their origin, production traits, and adaptability. Exotic dairy breeds are introduced from other countries and are known for high milk production and specific milk qualities.

Solution: The Jersey breed of cattle originated from the Island of Jersey, which is located in the United Kingdom. It is well known for producing milk with high fat content and excellent quality. Switzerland is the origin of Brown Swiss, the Netherlands is associated with Holstein Friesian, and India is the origin of indigenous breeds like Sahiwal and Gir. Therefore, Jersey cattle originate from the Island of Jersey (UK).

Final Answer: Island of Jersey (UK)

Answer: (B)

Q17.

Solution

Concept: Dairy animal nutrition focuses on providing balanced feed that meets all the nutritional requirements of animals for maintenance, growth, reproduction, and milk production.

Solution: A balanced ration is defined as a feed that supplies all essential nutrients such as carbohydrates, proteins, fats, minerals, vitamins, and water in proper proportion and adequate amount required by the animal for 24 hours. It ensures optimal health, productivity, and efficient utilization of nutrients. It is neither excessive nor deficient in nutrients. Therefore, the correct definition is proper proportion and amount for 24 hours.

Final Answer: Proper proportion and amount for 24 hours

Answer: (C)

Q18.

Solution

Concept: Cattle housing systems are designed to improve animal comfort, productivity, and management efficiency. Different systems are used depending on herd size, labor availability, and investment capacity.

Solution: The loose housing system allows cattle to move freely within a fenced or open enclosure, with separate areas for feeding and resting. It is considered cost-effective, especially for large herds, as it reduces construction costs and labor requirements while improving animal welfare. In contrast, tail-to-tail and head-to-head systems are more structured stall systems, and stanchion barns involve individual tethering of animals, which limits movement. Therefore, loose housing system is the correct answer.

Final Answer: Loose housing system

Answer: (C)

Q19.

Solution

Concept: Newborn calves require immediate nutrition after birth to ensure survival and immunity. Early feeding plays a crucial role in protecting them from infections during the initial stages of life.

Solution: Colostrum is the first milk produced by the mother after parturition and is rich in antibodies (immunoglobulins), nutrients, and growth factors. Its primary function is to provide passive immunity to the newborn calf, protecting it from diseases during early life when its immune system is not fully developed. It does not primarily serve for rapid weight gain, skin color change, or water reduction. Therefore, its main purpose is immunity transfer.

Final Answer: To provide passive immunity through antibodies

Answer: (B)

Q20.

Solution

Concept: Livestock diseases are caused by various pathogens including bacteria, viruses, fungi, and protozoa. The nature of the pathogen determines disease spread, symptoms, and control measures.

Solution: Foot and Mouth Disease (FMD) is a highly contagious viral disease affecting cloven-hoofed animals such as cattle, buffalo, sheep, and goats. It is caused by an Aphthovirus and spreads rapidly through direct contact and aerosols. Bacteria, protozoa, and fungi are not responsible for this disease. Therefore, the correct causative agent is virus.

Final Answer: Virus

Answer: (B)

Q21.

Solution

Concept: Poultry diseases affect different body systems depending on the pathogen involved. Understanding the target systems helps in diagnosis and control of disease outbreaks in poultry farming.

Solution: Ranikhet disease (Newcastle disease) primarily affects the respiratory and nervous systems of birds. It causes symptoms such as respiratory distress, coughing, paralysis, and twisted neck (torticollis). Although it may also affect the digestive system, the most prominent impact is on respiratory and nervous systems. Therefore, this is the correct answer.

Final Answer: Respiratory and nervous systems

Answer: (B)

Q22.

Solution

Concept: Some livestock diseases have been successfully controlled or eradicated globally through vaccination and disease management programs. These diseases often had severe impacts on animal health and productivity.

Solution: Rinderpest, also known as cattle plague, was a highly fatal viral disease of cattle characterized by high fever, erosive lesions in the mouth and digestive tract, and severe diarrhea. Due to successful global eradication programs led by veterinary organizations, it has been officially declared eradicated worldwide. Other diseases like coccidiosis, black quarter, and anthrax still exist in various regions. Therefore, rinderpest is the correct answer.

Final Answer: Rinderpest

Answer: (C)

Q23.

Solution

Concept: Poultry diseases are caused by different pathogens including protozoa, bacteria, viruses, and fungi. Coccidiosis is a well-known parasitic disease affecting the intestinal tract of birds.

Solution: Coccidiosis in poultry is caused by protozoan parasites belonging to the genus *Eimeria*. These parasites invade the intestinal lining, leading to symptoms such as bloody diarrhea, reduced feed intake, poor growth, and high mortality in severe cases. Pasteurella causes fowl cholera (bacterial disease), H5N1 is a viral influenza strain, and Aspergillus causes fungal infections like aspergillosis. Therefore, the correct causative organism is *Eimeria*.

Final Answer: Eimeria (Protozoa)

Answer: (A)

Q24.

Solution

Concept: Artificial Insemination (AI) in livestock involves preservation of semen at very low temperatures to maintain viability for long periods. Cryoprotectants are essential to protect sperm cells from damage during freezing.

Solution: Glycerol is the most commonly used cryoprotectant in the freezing of bovine semen. It prevents ice crystal formation inside sperm cells, thereby protecting cell membranes during storage in liquid nitrogen. Distilled water, sulphuric acid, and alcohol are not suitable for semen preservation and would damage sperm cells. Therefore, glycerol is the correct answer.

Final Answer: Glycerol

Answer: (B)

Q25.

Solution

Concept: Milk processing involves several thermal and mechanical treatments to ensure safety, shelf life, and quality. Different processes serve different purposes in dairy technology.

Solution: Pasteurization is the process of heating milk to a specific temperature for a defined period and then rapidly cooling it to destroy harmful pathogenic bacteria while preserving its nutritional and sensory qualities. Homogenization breaks fat globules, sterilization completely destroys all microorganisms at higher temperatures, and centrifugation is used for separation processes. Therefore, pasteurization is the correct answer.

Final Answer: Pasteurization

Answer: (C)

Q26.

Solution

Concept: Soil texture significantly affects water retention, drainage, aeration, and nutrient availability, which are crucial for crop growth and productivity.

Solution: Loam soil is considered the most suitable soil type for agriculture because it contains a balanced mixture of sand, silt, and clay. This balance provides good water-holding capacity, proper drainage, and adequate aeration, making it ideal for most crops. Sandy soil drains too quickly, clay soil retains excessive water, and silt alone lacks structural stability. Therefore, loam is the best agricultural soil.

Final Answer: Loam

Answer: (C)

Q27.

Solution

Concept: Soil pH management is essential for maintaining soil fertility. Highly acidic soils require amendments to neutralize excess acidity and improve nutrient availability.

Solution: Lime (calcium carbonate) is commonly used to neutralize acidic soils. It reacts with hydrogen ions in the soil, increasing the pH and improving conditions for plant growth. Gypsum is mainly used for sodic soils, urea is a nitrogen fertilizer, and elemental sulphur is used to acidify alkaline soils. Therefore, lime is the correct soil amendment for acidic soil with pH 4.5.

Final Answer: Lime (Calcium carbonate)

Answer: (B)

Q28.

Solution

Concept: Plant nutrients in fertilizers are represented by NPK, where Nitrogen (N), Phosphorus (P), and Potassium (K) play distinct roles in plant growth. Each nutrient influences specific physiological functions in plants.

Solution: Nitrogen is the primary nutrient responsible for vigorous vegetative growth in plants. It plays a key role in chlorophyll formation, which gives leaves their dark green color, and is essential for protein synthesis and cell division. Phosphorus mainly supports root development and energy transfer, while potassium improves disease resistance and overall plant health. Zinc is a micronutrient involved in enzyme activity but does not primarily control vegetative growth. Therefore, nitrogen is the correct answer.

Final Answer: Nitrogen

Answer: (C)

Q29.

Solution

Concept: Fertilizers are classified based on the number of nutrients they supply. Complex fertilizers contain more than one primary nutrient and are widely used to improve soil fertility efficiently.

Solution: Diammonium Phosphate (DAP) is a complex fertilizer that supplies both Nitrogen and Phosphorus to plants. It is widely used in agriculture as a starter fertilizer due to its high nutrient content and solubility. Muriate of Potash provides only potassium, Single Super Phosphate mainly provides phosphorus, and Calcium Ammonium Nitrate supplies nitrogen only. Therefore, DAP is the correct answer.

Final Answer: Diammonium Phosphate (DAP)

Answer: (B)

Q30.

Solution

Concept: Irrigation methods vary in their efficiency of water use. Modern irrigation techniques aim to minimize water loss and maximize delivery to the plant root zone.

Solution: Drip irrigation is considered the most efficient irrigation method, with water-use efficiency reaching up to 90%. It delivers water directly to the root zone in small, controlled amounts through emitters, reducing evaporation, runoff, and deep percolation losses. In contrast, border strip, furrow, and check basin irrigation methods involve surface application of water and are less efficient. Therefore, drip irrigation is the correct answer.

Final Answer: Drip irrigation

Answer: (C)

Q31.

Solution

Concept: Crop water requirement is an important concept in irrigation management and refers to the total water needed by a crop for its growth and physiological processes.

Solution: Consumptive use refers to the total amount of water used by a crop in evapotranspiration and metabolic activities over a given period. It includes water lost through evaporation from soil and transpiration from plants. This term accurately represents the total water requirement of a crop. Effective rainfall refers only to usable rainfall, duty of water relates to irrigation efficiency, and water requirement is a broader term often synonymous with consumptive use but less precise. Therefore, consumptive use is the correct answer.

Final Answer: Consumptive use

Answer: (D)

Q32.

Solution

Concept: Sub-surface drainage systems are used in agriculture to improve soil conditions by removing excess water and controlling salinity, thereby enhancing crop growth.

Solution: The primary objective of sub-surface drainage is to remove excess water and soluble salts from the soil profile to prevent waterlogging and salinity buildup. This improves soil aeration, root development, and overall crop productivity. It does not aim to increase water table, enhance surface runoff, or store water for later use. Therefore, removing excess salts and preventing waterlogging is the correct answer.

Final Answer: To remove excess soluble salts and prevent waterlogging

Answer: (B)

Q33.

Solution

Concept: Integrated Pest Management (IPM) uses a combination of methods such as cultural, biological, mechanical, and chemical practices to manage pests and weeds in an eco-friendly and sustainable way.

Solution: The stale seedbed technique involves preparing the field, allowing weeds to germinate, and then eliminating them before sowing the main crop. Since it modifies crop management practices without using chemicals or biological agents, it is classified under cultural control methods in IPM. Cultural control includes practices like crop rotation, timely sowing, and stale seedbed preparation to reduce pest and weed pressure. Therefore, it is a cultural control method.

Final Answer: Cultural control

Answer: (C)

Q34.

Solution

Concept: Herbicides are classified based on their mode of action (selective or non-selective) and whether they act systemically or as contact chemicals. In cereal crops, selective herbicides are used to control specific weed types without harming the crop.

Solution: 2,4-D is a selective, systemic herbicide widely used to control broad-leaved weeds in cereal crops like wheat and rice. It is absorbed and translocated within the plant, making it effective against dicot weeds. Butachlor is used mainly for grassy weeds in rice, Paraquat is a non-selective contact herbicide, and Glyphosate is a non-selective systemic herbicide used for total weed control. Therefore, 2,4-D is the correct answer.

Final Answer: 2,4-D

Answer: (B)

Q35.

Solution

Concept: Rice cultivation involves specific field preparation techniques to ensure proper water management and weed control. Puddling is an important step in lowland rice farming.

Solution: Puddling is the process of tilling soil in standing water to break down soil structure and form a compact, impervious layer. This reduces percolation losses of water, helps in water retention, and creates favorable conditions for rice transplanting. It also helps suppress weed growth. It does not aim to increase porosity, promote aerobic bacteria, or encourage deep root penetration. Therefore, reducing percolation losses and creating an impervious layer is the correct answer.

Final Answer: To reduce percolation losses of water and create an impervious layer

Answer: (B)

Q36.

Solution

Concept: Wheat crop growth stages are critical for irrigation management. Certain stages are highly sensitive to moisture stress and directly influence final yield.

Solution: The Crown Root Initiation (CRI) stage is the most critical stage for irrigation in wheat. Moisture stress during this stage severely affects root development, tillering, and ultimately reduces yield significantly. Although flowering and jointing stages are also important, CRI is considered the most sensitive stage for irrigation scheduling. The dough stage is less sensitive compared to early growth stages. Therefore, CRI stage is the correct answer.

Final Answer: Crown Root Initiation (CRI) stage

Answer: (C)

Q37.

Solution

Concept: Millets are classified based on their nutritional value, adaptability, and climatic requirements. Some millets are particularly rich in minerals such as calcium.

Solution: Ragi, also known as Finger Millet, is highly valued for its exceptional calcium content and nutritional benefits. It is widely grown in dry regions and is considered highly drought-tolerant. Bajra is Pearl Millet, Jowar is Sorghum, and Proso Millet is another small millet but not as rich in calcium as Ragi. Therefore, Ragi is the correct answer.

Final Answer: Ragi

Answer: (C)

Q38.

Solution

Concept: Sugarcane is a tall, heavy-stemmed crop that requires proper field management practices to ensure stability, growth, and maximum yield. Operations like earthing up help support the crop and improve productivity.

Solution: Earthing up (also called sett-prime in sugarcane management context) involves adding soil around the base of the cane plants. This practice provides mechanical support to the plants, strengthens root anchorage, and prevents lodging caused by wind or the heavy weight of mature canes. It does not promote flowering, induce dormancy, or reduce sugar content. Therefore, preventing lodging of heavy canes is the correct answer.

Final Answer: Prevent lodging of the heavy canes

Answer: (B)

Q39.

Solution

Concept: Precision farming uses advanced technologies to optimize field-level management with high accuracy. Spatial data collection tools are essential for mapping and monitoring agricultural variability.

Solution: The Global Positioning System (GPS) is primarily used in precision farming to provide accurate geographical coordinates for soil sampling, yield mapping, and field navigation. It helps in identifying precise locations within a field for data collection and analysis. Remote sensing provides aerial or satellite imagery, GIS is used for spatial data analysis, and VRT is used for applying inputs variably. Therefore, GPS is the correct answer.

Final Answer: Global Positioning System (GPS)

Answer: (B)

Q40.

Solution

Concept: Organic farming standards ensure sustainable agricultural production without synthetic chemicals or genetically modified organisms. Certification requires compliance with defined conversion and management practices.

Solution: A mandatory conversion period of 2–3 years is a key requirement for organic certification. During this period, the farm must be managed according to organic standards to eliminate residues of synthetic chemicals and restore soil biological activity. The use of GM seeds, synthetic growth regulators, and exclusive use of urea is strictly prohibited under organic standards. Therefore, the conversion period requirement is the correct answer.

Final Answer: A mandatory conversion period of 2–3 years

Answer: (B)

Q41.

Solution

Concept: Zero Budget Natural Farming (ZBNF) is an eco-friendly agricultural approach that emphasizes natural inputs, microbial cultures, and indigenous methods to improve soil fertility and crop productivity without external chemical inputs.

Solution: Jeevamrutha is a fermented microbial culture used in ZBNF as a soil inoculant. It is prepared using cow dung, cow urine, jaggery, pulse flour, and soil, and is used to enhance microbial activity in the soil, thereby improving nutrient availability to plants. NPK fertilizers, formaldehyde, and copper oxychloride are chemical inputs and not part of ZBNF practices. Therefore, Jeevamrutha is the correct answer.

Final Answer: Jeevamrutha

Answer: (B)

Q42.

Solution

Concept: Mango malformation is a serious physiological and pathological disorder affecting flowering and fruit set in mango. Its management involves hormonal regulation and cultural practices to reduce abnormal growth.

Solution: Application of NAA (Naphthalene Acetic Acid), a synthetic auxin, is widely used to manage the physiological aspects of mango malformation. It helps regulate abnormal floral growth and improves fruit set by balancing hormonal activity in the plant. Excessive irrigation and high nitrogen doses may worsen vegetative growth and increase susceptibility to malformation, while pruning during peak summer is not a standard management practice. Therefore, NAA application is the correct answer.

Final Answer: Application of NAA (Naphthalene Acetic Acid)

Answer: (A)

Q43.

Solution

Concept: Citrus crops are affected by several bacterial, fungal, viral, and phytoplasma diseases. Citrus canker is one of the most destructive diseases affecting leaves, stems, and fruits.

Solution: Citrus canker is caused by the bacterium *Xanthomonas citri*. It produces characteristic raised, corky lesions with a yellow halo on leaves and fruits, leading to premature leaf and fruit drop and reduced market quality. It is neither viral, fungal, nor mycoplasmal in nature. Therefore, Xanthomonas (bacteria) is the correct answer.

Final Answer: Xanthomonas (Bacteria)

Answer: (C)

Q44.

Solution

Concept: Tomato varieties are classified based on their growth habit as determinate and indeterminate types, which influence crop management practices and harvesting patterns.

Solution: Determinate tomato varieties exhibit bushy growth and terminate in a flower cluster, after which vegetative growth stops or becomes very limited. This leads to uniform fruit set and concentrated harvesting. Indeterminate varieties show continuous vine growth and require staking, while determinate types are more compact. Therefore, bushy growth ending in a flower cluster is the correct characteristic.

Final Answer: Bushy growth ending in a flower cluster

Answer: (B)

Q45.

Solution

Concept: Potato is a tuber crop where proper soil management practices are essential to protect tubers and ensure good yield and quality.

Solution: Earthing up in potato is the practice of covering the base of the plant with soil to prevent exposure of developing tubers to sunlight. If tubers are exposed to light, they turn green due to chlorophyll formation and may accumulate toxic compounds like solanine. Therefore, the primary purpose of earthing up is to prevent greening of tubers by blocking light exposure.

Final Answer: To prevent the exposure of tubers to light (greening)

Answer: (B)

Q46.

Solution

Concept: Vegetative propagation in horticultural crops is widely used to multiply superior plant varieties while maintaining genetic identity. Grafting is a key technique in fruit crop improvement.

Solution: Grafting is the method of vegetative propagation in which a scion (a shoot or bud from a desired superior variety) is joined onto a rootstock (a hardy, disease-resistant plant). The rootstock provides a strong root system, while the scion contributes desirable fruiting characteristics. Air layering, cuttings, and runners are other propagation methods but do not involve combining two different plant parts in this way. Therefore, grafting is the correct answer.

Final Answer: Grafting

Answer: (B)

Q47.

Solution

Concept: Air layering is a vegetative propagation method used in woody plants where roots are induced on a stem while it is still attached to the parent plant.

Solution: In air layering (Gooty), sphagnum moss is commonly used to wrap the girdled portion of the branch. It helps retain moisture, encourages root formation, and provides a suitable environment for root initiation. The moss is usually covered with polythene to prevent drying. Dry sand, sawdust, and plastic beads are not effective for maintaining the required moisture and aeration balance. Therefore, sphagnum moss is the correct answer.

Final Answer: Sphagnum moss

Answer: (B)

Q48.

Solution

Concept: Shield budding (T-budding) is a widely used vegetative propagation technique in horticulture, especially for fruit and ornamental crops, due to its simplicity and high success rate.
Solution: T-budding is most commonly and commercially successful in crops like rose and citrus. It allows efficient multiplication of superior varieties with good compatibility between scion and rootstock. Banana and papaya are generally propagated through suckers and seeds respectively, while coconut is propagated through seed nuts. Therefore, rose and citrus are the correct answer.
Final Answer: Rose and Citrus

Answer: (C)

Q49.

Solution

Concept: In fruit processing, the end-point determination of products like jam, jelly, and ketchup is important to ensure proper consistency, texture, and shelf stability.
Solution: The sheet test or flake test is commonly used to determine the end-point of fruit jam preparation. In this test, a sample of boiling jam is taken and allowed to cool slightly; if it falls in the form of a sheet or flakes rather than drops, it indicates the correct consistency. This method is widely used in jam making rather than ketchup or pickle preparation. Therefore, fruit jam is the correct answer.
Final Answer: Fruit Jam

Answer: (B)

Q50.

Solution

Concept: Fruit product standards such as those defined under FPO (Fruit Products Order) specify quality parameters like Total Soluble Solids (TSS) to ensure uniformity, preservation, and market quality of processed products like jam, jelly, and squashes.
Solution: Jam is a semi-solid fruit product prepared by boiling fruit pulp with sugar until it reaches a thick consistency. According to FPO specifications, jam must contain a high concentration of sugar and soluble solids to ensure proper gel formation and preservation. The minimum Total Soluble Solids (TSS) required for a product to be labeled as jam is 65%. This high TSS level helps in preventing microbial spoilage and ensures desirable texture and shelf stability. Lower values such as 45%, 25%, or 10% are insufficient for proper jam consistency and preservation standards.
Final Answer: 65%

Answer: (B)

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	B	3	B	4	B	5	B
6	C	7	B	8	C	9	B	10	B
11	C	12	B	13	C	14	B	15	C
16	B	17	C	18	C	19	B	20	B
21	B	22	C	23	A	24	B	25	C
26	C	27	B	28	C	29	B	30	C
31	D	32	B	33	C	34	B	35	B
36	C	37	C	38	B	39	B	40	B
41	B	42	A	43	C	44	B	45	B
46	B	47	B	48	C	49	B	50	B