KRIBHCO Field Representative Trainee Sample Paper

Q1. Growing annual crops between the rows of trees is:
(a) Relay cropping
(b) Mixed cropping
(c) Inter cropping
(d) Alley cropping

Q2. The anti-nutritional factor present in the oil of rapeseed and mustard is:
(a) Hydrocyanic acid
(b) Calcium oxalate
(c) Erucic acid
(d) Ricinine

Q3. Which of the following is a highly digestive protein crop?
(a) Maize
(b) Cotton
(c) Paddy
(d) Wheat

Q4. Which of the following soil colloids is generally found in black cotton soil?
(a) Vermiculite
(b) Montmorillonite
(c) Illite mineral
(d) Chlorite

Q5. What is the seed rate of Bt cotton?
(a) 1–1.5 kg/ha
(b) 3–4 kg/ha
(c) 4–5 kg/ha
(d) 5–6 kg/ha

Q6. Which of the following enzymes induces germination of seed?
(a) Dehydrogenase enzyme
(b) Hydrolytic enzyme
(c) Nitrogenase enzyme
(d) Urease enzyme

Q7. Which of the following is the noble cane?
(a) Saccharum officinarum
(b) Saccharum spontaneum
(c) Saccharum barberi
(d) Saccharum robustum

Q8. Which of the following methods of sowing requires maximum seed rate?
(a) Transplanting method
(b) Broadcasting method
(c) Drill method
(d) Dibbling method

Q9. What is the optimum plant population of Bt-cotton?
(a) 100000 plant/ha
(b) 10000 plant/ha
(c) 50000 plant/ha
(d) 80000 plant/ha

Q10. Protandry condition is found in:
(a) Maize
(b) Bajra
(c) Sorghum
(d) Wheat

Q11. Clay particles of soil has diameter (mm)
(a) > 0.02 mm
(b) > 0.002 mm
(c) < 0.002 mm
(d) None of these

Q12. Moisture Deficit Index (MDI) can be calculated by the formula:
(a) $(\frac{P-PE}{P}) \times 100$
(b) $(\frac{P-PE}{PE}) \times 100$
(c) $(\frac{PE-P}{PE}) \times 100$
(d) $(\frac{PE-P}{P}) \times 100$

Q13. Saline soils could be improved by –
(a) Leaching
(b) Gypsum application
(c) Pyrite application
(d) Sulphur application

Q14. Mycorrhiza is an association of:
(a) Bacteria and legumes
(b) BGA and *Azolla*
(c) Fungi and Algae
(d) Fungi and plant root

Q15. The process of accumulation of materials in B horizons is called:
(a) Eluviation
(b) Carbonation
(c) Illuviation
(d) Oxidation

Q16. The Law of Minimum was given by:
(a) Mitscherlich
(b) Spillman
(c) J.V. Liebig
(d) Thomas Way

Q17. Medium range of available phosphorus (kg/ha) in soil is:
(a) < 10
(b) 10–20
(c) 20–50
(d) > 50

Q18. Submergence of alkaline soil tends to:
(a) Increase its pH
(b) Decrease its pH
(c) Decrease then increase its pH
(d) No any effect

Q19. Who launched nano fertilizer in India?
(a) Vijay Rupani
(b) C.N.R. Rao
(c) Heinrich Rohrer
(d) P. C. Ray

Q20. The crystal units of montmorillonite are held together by:
(a) O-H linkage
(b) O-O linkage
(c) H-Bonding
(d) Covalent bonding

Q21. Cross-pollinated crops are:
(a) Muskmelon, Watermelon, Pumpkin, Cucumber
(b) Spinach, Onion, Garlic, Wheat
(c) Wheat, Barley, Rice, Onion
(d) Pea, Groundnut, Gram, Cabbage

Q22. Which fruit is also known as the 'Poor man's Apple'?
(a) Custard Apple
(b) Pomegranate
(c) Date palm
(d) Guava

Q23. Which tool is typically used for mowing turf?
(a) Pruning shear
(b) Tiller
(c) Lawn mower
(d) Sprayer

Q24. Variety of mango developed by cross between Neelum and Alphonso is:
(a) Ratna
(b) Sindhu
(c) Amrapali
(d) Arka Puneet

Q25. Royal gold is a variety of:
(a) Rose
(b) Marigold
(c) Carnation
(d) Chrysanthemum

Q26. Indian Institute of Horticultural Research is located at:
(a) Kanpur
(b) Hyderabad
(c) Indore
(d) Bengaluru

Q27. 'Arka Harit' is a variety of:
(a) Spongegourd
(b) Bittergourd
(c) Ridgegourd
(d) Muskmelon

Q28. Which one of the following is the variety of Muskmelon?
(a) Durgapura Madhu
(b) Sugar Baby
(c) Pusa Chikani
(d) Pusa Naveen

Q29. What is the optimum time of planting of tuberose in the North Indian plains?
(a) December – January
(b) February – March
(c) June – July
(d) October – November

Q30. Which of the following is a causal organism of black spot disease in rose?
(a) Diplocarpon rosae
(b) Diplodia rosarum
(c) Agrobacterium tumefaciens
(d) Botrytis cinerea

Q31. Which method is most effective in controlling Panama disease in banana?
(a) Spraying zinc carrier
(b) Spraying copper fungicide
(c) Application of lime to the soil
(d) Providing adequate irrigation

Q32. Which chemical group is most effective in controlling bacterial diseases in plants?
(a) Kelthane
(b) Fungicide
(c) Antibiotics
(d) Viricides

Q33. The concept of polymorphism in fungi was first introduced by –
(a) Anton de Bary
(b) Tulsane brothers
(c) E.M. Fries
(d) B. Prevost

Q34. Which fungi are considered entomopathogenic (kill insects)?
(a) Beauveria bassiana
(b) Metarhizium anisopliae
(c) Trichoderma harzianum
(d) Both (a) and (b)

Q35. Yellow vein mosaic disease of okra is transmitted by –
(a) Jassids
(b) Borers
(c) Jassids and borers
(d) Whiteflies

Q36. Which species of Penicillium is used in cheese production?
(a) Penicillium notatum
(b) Penicillium roqueforti
(c) Penicillium diversicaudatum
(d) Penicillium crysogenum

Q37. Which one of the given responses would be meaningful order of the following? (1) Pupa (2) Larva (3) Moth (4) Egg
(a) 4, 2, 1, 3
(b) 4, 1, 2, 3
(c) 4, 3, 2, 1
(d) 4, 3, 1, 2

Q38. Which pest is known to attack all parts of the plant?
(a) Aphid
(b) Termite
(c) Grasshopper
(d) Whitefly

Q39. Which pest causes tunneling damage in potato tubers and is a major concern in potato storage?
(a) Colorado potato beetle
(b) Potato aphid
(c) Potato tuber moth
(d) Potato flea beetle

Q40. Which of the following types of pesticide formulation is mainly used in storage structures and seed godowns?
(a) Solid formulations
(b) Liquid formulations
(c) Gaseous formulations
(d) All of the above

Q41. NPV is primarily used to control which of the following types of insects?
(a) Coleopteran insects
(b) Lepidopteran insects
(c) Hemipteran insects
(d) Dipteran insects

Q42. Which is the largest pesticide-consuming crop in India?
(a) mango
(b) Cotton
(c) Wheat
(d) Sugarcane

Q43. Agricultural economics is primarily concerned with:
(a) Application of physics in crop production
(b) Biological techniques in livestock
(c) Allocation of scarce resources in agriculture
(d) Rural social structure

Q44. A farming system that integrates crops and livestock with minimal external input is called:
(a) Commercial farming
(b) Integrated farming system
(c) Contract farming
(d) Mono-cropping

Q45. The concept of utility in agricultural economics refers to:
(a) Soil fertility
(b) Satisfaction derived from goods
(c) Weather predictability
(d) Farm mechanization

Q46. The ratio of gross return to cost of cultivation is known as:
(a) Net income
(b) Cost-benefit index
(c) Marginal return
(d) B:C Ratio

Q47. WTO's Agreement on Agriculture (AoA) classifies subsidies into:
(a) Yellow, White, Black
(b) Green, Blue, Amber
(c) Red, Green, Grey
(d) High, Medium, Low

Q48. Communication is the process by which messages are transferred from source to:
(a) Channel
(b) Message
(c) Receiver
(d) Effects

Q49. Paramparagat Krishi Vikas Yojana (PKVY) for farmers promotes:
(a) Modern agricultural practices
(b) Crop Insurance
(c) Organic farming
(d) Credit flow

Q50. The first All India Coordinated Research Project (AICRP) was started on which crop?
(a) Wheat
(b) Rice
(c) Maize
(d) Cotton

Q51. ATMA stands for _____
(a) Agriculture Training and Management Association
(b) Agricultural Technology and Marketing Agency
(c) Agriculture Technology Management Agency
(d) Agricultural Training and Mentorship Association

Q52. Lab to land programme was launched by the ICAR as a part of its Jubilee celebration in 1979.
(a) Centenary
(b) Platinum
(c) Golden
(d) Silver

Q53. The Mission for Integrated Development of Horticulture (MIDH) is a Centrally Sponsored Scheme launched in:
(a) 2012-13
(b) 2013-14
(c) 2014-15
(d) 2015-16

Q54. The DNA can also be called a:
(a) Polysaccharide
(b) Polypeptide
(c) Polynucleotide
(d) Polymerase

Q55. Photosynthesis occurs in:
(a) Thylakoid
(b) Matrix
(c) Chromoplast
(d) Leucoplast

Q56. Hydrolysis of fat is catalysed by:
(a) Hydrolase
(b) Catalase
(c) Amylase
(d) Lipase

Q57. What is the term for the process of nutrient absorption by plants through their roots in the form of ions?
(a) Translocation
(b) Osmosis
(c) Active uptake
(d) Passive diffusion

Q58. Replacement of the existing community caused largely by any other external condition and not by the existing organisms:
(a) Heterotrophic succession
(b) Autogenic succession
(c) Allogenic succession
(d) Secondary succession

Q59. Chlorophyll b is more soluble than chlorophyll a in polar solvents because of its:
(a) Carbonyl group
(b) Hydrogen bond
(c) Hydroxyl group
(d) None of these

Q60. Proteins are made up of:
(a) Diamines
(b) Phenols
(c) Sugars
(d) Amino acids

Q61. Who is known as the father of plant tissue culture?
(a) Aristotle
(b) G.J. Mendel
(c) G. Haberland
(d) Theophrastus

Q62. Crossing of F_1 with homozygous recessive parent is called:
(a) Pure Line
(b) Back-Cross
(c) Test-Cross
(d) Inbred Line

Q63. Which GM crop is approved in India?
(a) Bt Corn
(b) Bt Brinjal
(c) Bt Cotton
(d) GM Tomato

Q64. Which of the following is not a commonly used molecular marker for plant genome mapping?
(a) RFLP
(b) RAPD
(c) PCR
(d) None

Q65. What technique is used in plant DNA fingerprinting for varietal identification?
(a) Western blot
(b) RFLP
(c) ELISA
(d) qPCR

Q66. Maturity of stamens and pistils at different time is called as?
(a) Cleistogamy
(b) Dioecy
(c) Dichogamy
(d) Dicliny

Q67. Possible reasons for seed dormancy are:
(a) Presence of pathogens
(b) Cracking of hulls
(c) Immature embryo
(d) Green distortion

Q68. Seeds that can be dried to low moisture content and stored at low temperatures without losing viability for long periods are called?
(a) Recalcitrant seeds
(b) Orthodox seeds
(c) Viviparous seeds
(d) Dormant seeds

Q69. Which hormone is used for breaking seed dormancy?
(a) Cytokinin
(b) Auxin
(c) Gibberellins
(d) Ethylene

Q70. What is the reason for seed dormancy?
(a) Starch
(b) Glucose
(c) Ethylene
(d) Abscisic acid

Q71. Which of the following not belong to Post harvest handling of seed crop?
(a) Seed Selection
(b) Threshing
(c) Drying
(d) Grading

Q72. The renewal of a forest crop by self-sown seed or by coppice or by root suckers are called as:
(a) Natural regeneration
(b) Artificial regeneration
(c) Both natural and artificial regeneration
(d) None of these

Q73. The oldest form of Agroforestry is:
(a) Alley cropping
(b) Taungya system
(c) Home garden
(d) Shifting cultivation

Q74. Which of these is the biggest goat breed?
(a) Jamunapari
(b) Surti
(c) Mehsana
(d) Marwari

Q75. Mohair is obtained from which animal?
(a) Merino
(b) Angora goats
(c) Nagori
(d) Mehsana

Q76. An adult female sheep is_____
(a) Mare
(b) Doe
(c) Ewe
(d) None of these

Q77. Viral disease in poultry birds is:
(a) Coccidiosis
(b) Moniliasis
(c) Hexamitiasis
(d) Ranikhet

Q78. The product formed by the fermentation of any green plant material in the absence of air is known as _____.
(a) Hay
(b) Silage
(c) Straw
(d) Lint

Q79. Which of the following is not the indigenous milch breed of cattle? Choose the most appropriate answer from the options given below:
(a) Jersey
(b) Red Sindhi
(c) Tharparkar
(d) Sahiwal

Q80. The incubation period of Rinderpest disease in cattle is of how many days?
(a) 8 – 10
(b) 3 – 7
(c) 1 – 3
(d) 13 – 15

Q81. What is the theme for World No Tobacco Day 2025?
(a) "Quit Today. Live Tomorrow."
(b) "Bright products. Dark intentions. Unmasking the Appeal."
(c) "Smoke-Free Youth, Smoke-Free Future."
(d) "Tobacco-Free World by 2025."

Q82. World Hunger Day is observed every year on which date, and what is its primary focus?
(a) May 15; Food Aid and Relief
(b) May 28; Empowering communities for sustainable food security
(c) October 16; Ending global hunger through charity
(d) December 5; Promoting urban food banks

Q83. The Ministry of Panchayati Raj launched Panchayat Advancement Index (PAI) 2.0 during a National Writeshop held in which city in 2025?
(a) Mumbai
(b) Bengaluru
(c) New Delhi
(d) Hyderabad

Q84. The 'Mukhya Mantri Lok Sevak Arogya Yojana' is intended to benefit which group?
(a) BPL families
(b) Women entrepreneurs
(c) Government employees and pensioners
(d) Unemployed youth

Q85. Who conferred the National Florence Nightingale Awards 2025 to 15 outstanding nursing professionals?
(a) Narendra Modi
(b) Jagat Prakash Nadda
(c) Droupadi Murmu
(d) Anupriya Patel

Q86. Which award did Serena Williams receive in 2025?
(a) Bharat Ratna
(b) Princess of Asturias Award for Sports
(c) Olympic Gold Medal
(d) Laureus World Sports Award

Q87. Who retired from international football in 2025?
(a) Lionel Messi
(b) Cristiano Ronaldo
(c) Mary Earps
(d) Megan Rapinoe

Q88. Who became the first Indian to win a Formula 2 race, achieving this milestone at the Monaco Grand Prix Sprint Race in May 2025?
(a) Arjun Maini
(b) Kush Maini
(c) Narain Karthikeyan
(d) Jehan Daruvala

Q89. Who won the ICC Men's Player of the Month award for April 2025?
(a) Blessing Muzarabani
(b) Ben Sears
(c) Mehidy Hasan Miraz
(d) Mushfiqur Rahim

Q90. Which country was the host of the 9th Asian Winter Games?
(a) Japan
(b) China
(c) India
(d) South Korea

Q91. The peace treaty between Armenia and Azerbaijan includes establishing which corridor between the two nations?
(a) Khyber Corridor
(b) Zangezur Corridor
(c) Durand Corridor
(d) Suez Corridor

Q92. Recently, which country has officially joined the BRICS-backed New Development Bank (NDB)?
(a) Nigeria
(b) Algeria
(c) Egypt
(d) South Africa

Q93. Which country recently assumed the rotating chairmanship of the Arctic Council, taking over from Norway?
(a) Canada
(b) Sweden
(c) Denmark
(d) Russia

Q94. Which Pakistan region was recently declared independent by local leaders?
(a) Sindh
(b) Balochistan
(c) Gilgit-Baltistan
(d) Khyber Pakhtunkhwa

Q95. The RBI's methods of credit control may be broadly divided into the parts:
(a) Quantitative and qualitative
(b) Fiscal and monetary
(c) Rural and urban
(d) Open and closed

Q96. 'Mitra Yojana' is related to_____
(a) Small Enterprise
(b) Medium Enterprise
(c) Large Enterprise
(d) All of the above

Q97. What is the main purpose of the GROW report and portal launched by NITI Aayog?
(a) To promote water conservation techniques
(b) To map and prioritize wastelands for agroforestry use
(c) To replace traditional farming with agroforestry entirely
(d) To monitor forest fires across India

Q98. Which of the following is the implementing agency for the National Agricultural Insurance Scheme?
(a) Food Corporation of India
(b) Commission for Agricultural Costs and Prices
(c) Agricultural Insurance Company of India Limited
(d) NABARD

Q99. Which is a Scheme of NABARD related to agriculture?
(a) Agri clinic
(b) Agribusiness Centres Scheme
(c) Both (a) and (b)
(d) None of these

Q100. The program used in the digitization technique of geoinformatics:
(a) CAD
(b) GPS
(c) C plus
(d) JAVA

Solutions

S1. Ans.(d)
Sol. Alley cropping is an agroforestry system where **annual crops** are grown between rows of **perennial trees or shrubs**.
Enhances **soil fertility**, reduces erosion, and increases income.

S2. Ans.(c)
Sol. ✔ (c) Erucic acid: Erucic acid is a toxic monounsaturated omega-9 fatty acid found in high quantities in traditional varieties of rapeseed and mustard oils.
Associated with cardiac lipidosis (fat accumulation in heart tissues) when consumed in excess
Modern varieties like Canola are bred to have very low levels (<2%) of erucic acid for safe consumption
✘ (a) Hydrocyanic acid: Present in crops like sorghum and cassava, not rapeseed or mustard.
✘ (b) Calcium oxalate: Found in leafy greens like spinach; not an oil-associated compound.
✘ (d) Ricinine: A toxic alkaloid present in castor seeds, not rapeseed or mustard.

S3. Ans.(d)
Sol. ✅ (d) Wheat:
• Wheat is a rich source of highly digestible plant protein, mainly gluten.
• It provides around 12–14% protein, making it one of the better cereals in protein content.
• The protein in wheat is easily absorbed by the human digestive system.
• It is widely consumed globally for its nutritional value and digestibility.
✘ (a) Maize:
• Maize has moderate protein content (8–10%) but is relatively less digestible than wheat.
• Its zein protein is deficient in essential amino acids like lysine and tryptophan.
✘ (b) Cotton:
• Cotton is not grown for human consumption as a protein crop.
• Cottonseed contains gossypol, which is toxic and limits its use in food.
✘ (c) Paddy:
• Paddy (rice) has low protein content (6–7%) and is not considered a significant protein source.
• The digestibility of rice protein is lower than wheat, especially when polished.

S4. Ans.(b)

Sol. ✅ (b) Montmorillonite:

• Black cotton soil, also known as regur soil, is rich in montmorillonite clay minerals.

• Montmorillonite is a 2:1 type expanding clay mineral that causes the soil to swell when wet and shrink when dry, leading to deep cracks.

• It has a high cation exchange capacity (CEC), making it very fertile and ideal for crops like cotton, soybean, and pulses.

❌ (a) Vermiculite:

• Although it is also a 2:1 clay mineral with high CEC, vermiculite is not commonly found in black cotton soil.

• It is more prevalent in certain weathered igneous rocks.

❌ (c) Illite mineral:

• Illite is a non-expanding 2:1 clay mineral.

• It is common in temperate region soils but is not dominant in black cotton soil.

❌ (d) Chlorite:

• Chlorite is a 2:2 clay mineral and has low CEC.

• It is relatively stable and rare in black cotton soils.

S5. Ans.(a)

Sol. ✅ (a) 1–1.5 kg/ha:

• The recommended seed rate for Bt cotton is 1 to 1.5 kilograms per hectare.

• This range is sufficient to achieve the optimum plant population when proper spacing and sowing methods are followed.

• Using this seed rate ensures good plant stand while minimizing seed wastage and cost.

❌ (b) 3–4 kg/ha:

• This rate is excessive for Bt cotton cultivation.

• It may lead to overcrowding, poor plant growth, and increased thinning requirements.

❌ (c) 4–5 kg/ha:

• Similar to option B, this rate is too high.

• Not advisable under normal sowing conditions for Bt hybrids.

❌ (d) 5–6 kg/ha:

• This much seed per hectare is used only in desi cotton or non-Bt varieties.

• For Bt cotton, this results in wastage and suboptimal crop performance.

S6. Ans.(b)

Sol. ✅ (b) Hydrolytic enzyme:

• During seed germination, hydrolytic enzymes like amylases, proteases, and lipases break down stored food materials in the seed.

• These enzymes convert starch to sugars, proteins to amino acids, and lipids to fatty acids and glycerol, making nutrients available to the growing embryo.

• Their activity is crucial for initiating metabolic functions and supporting seedling growth.

• Gibberellins trigger the production of these enzymes in the aleurone layer of cereal grains.

❌ (a) Dehydrogenase enzyme:
• Dehydrogenases are involved in respiration and energy metabolism, but do not directly induce germination.
❌ (c) Nitrogenase enzyme:
• Found in nitrogen-fixing bacteria, nitrogenase is involved in biological nitrogen fixation, not seed germination.
❌ (d) Urease enzyme:
• Urease breaks down urea into ammonia in the soil and has no direct role in seed germination.

S7. Ans.(a)
Sol. ✅ (a) Saccharum officinarum:
• Known as the noble cane, Saccharum officinarum is a tropical species of sugarcane.
• It is characterized by thick juicy stalks, high sucrose content, and is the primary source of commercial sugar.
• It also exhibits low fiber content, making it ideal for sugar extraction.
• Cultivated extensively in tropical regions, it forms the genetic base for many high-yielding hybrids.
❌ (b) Saccharum spontaneum:
• This is a wild species of sugarcane with thin stalks and low sugar content.
• It is primarily used in breeding programs for disease resistance and hardiness, but not considered noble cane.
❌ (c) Saccharum barberi:
• Indigenous to India, it is shorter, with lower sugar content compared to S. officinarum.
• Not categorized as noble cane.
❌ (d) Saccharum robustum:
• Found in New Guinea, this species has limited commercial value.
• It is mainly used in breeding for traits like vigour and disease tolerance, not sugar production.

S8. Ans.(b)
Sol. ✅ (b) Broadcasting method:
• In broadcasting, seeds are scattered manually or mechanically over the soil surface.
• It leads to uneven distribution, overlapping, and wastage of seeds, which demands a higher seed rate.
• The method is quick and simple, but has low germination efficiency and poor plant spacing.
❌ (a) Transplanting method:
• Transplanting involves growing seedlings in nurseries and then planting them in the field.
• It uses very low seed rates as the seedlings are placed precisely.
❌ (c) Drill method:
• The drill method places seeds at uniform depth and spacing using seed drills.
• It requires a moderate seed rate, less than broadcasting but more than transplanting.
❌ (d) Dibbling method:
• Seeds are sown manually in holes at equal distance.
• It ensures minimal seed wastage and requires the lowest seed rate among all methods.

S9. Ans.(b)

Sol. ✅ (b) 10000 plant/ha:

• The ideal or optimum plant population for Bt-cotton is approximately 10,000 plants per hectare.

• This density ensures adequate spacing, good aeration, and sunlight penetration, which are critical for healthy plant development.

• Optimal spacing also helps in reducing pest and disease pressure, and in achieving better boll setting and yield efficiency.

❌ (a) 100000 plant/ha:

• This is too dense a population for Bt-cotton.

• Overcrowding can lead to competition for nutrients, light, and water, and promotes pest and disease infestation.

❌ (c) 50000 plant/ha:

• Although lower than 100000, this number is still excessively high for optimum growth.

• It can lead to reduced yield per plant due to intra-specific competition.

❌ (d) 80000 plant/ha:

• This population density is again too high for Bt-cotton.

• It compromises plant health and leads to suboptimal economic returns.

S10. Ans.(a)

Sol. ✅ (a) Maize:

• Protandry refers to a condition where the male parts (anthers) mature before the female parts (stigmas).

• In maize, the tassels (male flowers) release pollen before the emergence of silks (female flowers).

• This encourages cross-pollination and helps avoid self-pollination.

• Therefore, maize is a classic example of protandry.

❌ (b) Bajra:

• Bajra generally shows protogyny, where the female parts mature before the male ones.

• Hence, it does not show protandry.

❌ (c) Sorghum:

• Sorghum typically exhibits synchrony in the maturity of male and female parts.

• It does not have protandry.

❌ (d) Wheat:

• Wheat is predominantly self-pollinated and shows cleistogamy (closed flowers).

• No protandry is found in wheat.

S11. Ans.(c)

Sol. Soil separates based on size:

Sand: > 0.05 mm

Silt: 0.002 – 0.05 mm

Clay: < 0.002 mm

Hence, clay particles are the finest and have a diameter less than 0.002 mm.

S12. Ans.(b)

Sol. Moisture Deficit Index (MDI) is an indicator of the **moisture stress** experienced by an area.

The formula is:

$$\text{MDI} = \left(\frac{P - PE}{PE}\right) \times 100$$

where:

P = Precipitation (actual rainfall)

PE = Potential Evapotranspiration

If **P < PE**, the index is **negative**, indicating a **moisture deficit**.

A **positive MDI** indicates sufficient or excess moisture.

S13. Ans.(a)

Sol. The correct answer is **leaching.**

Saline soils have a pH of 7.5-8.5.

Exchangeable Sodium Percentage (ESP) < 15%.

When salts accumulate in soils, problems arise for two main reasons: the soil becomes less permeable, and the salt damages or kills the plants.

Leaching can be used to reduce the salts in soils.

Add enough low-salt water to the soil surface to dissolve the salts and move them below the root zone.

The water must be relatively free of salts (1,500-2,000 ppm total salts), particularly sodium salts.

A water test can determine the level of salts in water.

Leaching works well on saline soils that have good structure and internal drainage.

S14. Ans.(d)

Sol. Mycorrhiza is a mutualistic symbiotic association between:

Fungal hyphae and plant roots.

Benefits:

Fungi help in absorbing water and nutrients (especially phosphorus).

Plants supply carbohydrates to the fungi.

Types:

Ectomycorrhiza – Fungi remain outside root cells.

Endomycorrhiza (Arbuscular) – Fungi penetrate root cells.

S15. Ans.(c)

Sol. Soil horizons form due to movement of materials through soil layers.

Illuviation is the:

Deposition or accumulation of leached materials (clay, organic matter, iron) into the B horizon.

Contrast with:

Eluviation – Removal or leaching of materials from upper layers (A horizon).

Carbonation – Chemical weathering due to carbonic acid.

Oxidation – Chemical reaction with oxygen (common in iron-rich soils).

S16. Ans.(c)
Sol. Justus von Liebig, a German chemist, proposed the Law of the Minimum in the mid-19th century.
It states:
"Plant growth is limited by the nutrient that is in shortest supply, even if all others are in abundance."
This principle guides balanced fertilization:
Even high levels of N and K won't help if P is deficient.

S17. Ans.(b)
Sol. Available phosphorus (P) in soil is measured in kg/ha using methods like Olsen or Bray's.
Classification range (Olsen method – common for alkaline soils):
Low: < 10 kg/ha
Medium: 10–20 kg/ha ✅
High: > 20 kg/ha
Adequate phosphorus is crucial for:
Root development
Flowering and fruiting
Energy transfer (ATP)

S18. Ans.(b)
Sol. Submergence (flooding) of alkaline soil results in:
Anaerobic conditions
Production of CO_2, organic acids
Reduction of oxidized compounds
These processes lower the soil pH, especially in sodic and alkaline soils.
Helpful in reclaiming sodic soils, particularly during rice cultivation.

S19. Ans.(a)
Sol. Vijay Rupani, the then Chief Minister of Gujarat, launched India's first nanofertilizer, developed by IFFCO (Indian Farmers Fertiliser Cooperative).
Launch Year: 2021
Product: IFFCO Nano Urea – a liquid fertilizer designed to:
Enhance nutrient use efficiency
Reduce overuse of urea
Improve soil and plant health
Nanofertilizers aim to minimize input costs and boost sustainable agriculture.

S20. Ans.(c)
Sol. Montmorillonite is a type of 2:1 clay mineral from the smectite group.
It has:
Two tetrahedral sheets sandwiching one octahedral sheet.
Interlayer spaces are held together by hydrogen bonding (H-bonding) and van der Waals forces.
These bonds are:
Weak, allowing water and cations to enter, causing swelling.
This is why montmorillonite exhibits high cation exchange capacity and expansive behavior.

S21. Ans.(a)
Sol. Muskmelon, watermelon, pumpkin, cucumber are naturally **cross-pollinated**.
Cross-pollination promotes **genetic diversity** and improves **vigor**.
Insects like bees are common pollinators for these crops.

S22. Ans.(d)
Sol. Guava is rich in Vitamin C and affordable.
Hence, called the **"Poor man's Apple"**.
Economically accessible and nutritionally rich.

S23. Ans.(c)
Sol. A lawn mower is the standard equipment used for mowing turf. It cuts grass at uniform height, which is crucial for turf aesthetics and health. Regular mowing promotes tillering and denser grass cover.

S24. Ans.(a)
Sol. Ratna is a **hybrid variety** developed by crossing **Neelum × Alphonso**.
It is **free from spongy tissue** and has regular bearing traits.
Developed by **IARI** for high quality fruit.

S25. Ans.(a)
Sol. Royal Gold is a popular **variety of rose** known for its **deep golden-yellow flowers**.
It is a **floribunda-type** rose, often used in **gardens and floral arrangements**.
This variety is appreciated for its **color, fragrance**, and **disease resistance**.
The other options, like **Marigold, Carnation, and Chrysanthemum**, have their own distinct varieties but are not associated with the name "Royal Gold."

S26. Ans.(d)
Sol. IIHR (Indian Institute of Horticultural Research) is located in **Bengaluru, Karnataka**.
It functions under **ICAR** and deals with **horticultural crop research**.

S27. Ans.(b)
Sol. Arka Harit is a high-yielding, early-maturing variety of **bittergourd**.
Developed by **IIHR, Bengaluru**.
Features include **medium long fruits** and tolerance to pests.

S28. Ans.(a)
Sol. Durgapura Madhu is a variety of **Muskmelon**.
Known for its **high sweetness (TSS)** and yield.
Sugar Baby is a **watermelon** variety.

S29. Ans.(b)
Sol. Tuberose (Polianthes tuberosa) is a popular **bulbous ornamental plant**, grown extensively for its **fragrant flowers** used in cut flower trade, garlands, and perfumery.
Key Points:
In the **North Indian plains**, the **optimum planting time** for tuberose is **February to March**.
Why February–March?
The temperature during this period is **ideal for sprouting** and **early establishment** of bulbs.
Plants get sufficient time for **vegetative growth** before entering the **flowering phase** in summer.
This timing ensures **early and profuse flowering**.
Planting during **very cold (December–January)** or **very hot months (June–July)** is not ideal for tuberose establishment in North India.
Other Options Explained:
(a) December – January:
Too cold for proper sprouting and growth of tuberose bulbs.
(c) June – July:
Very hot and monsoon onset — not ideal for tuberose planting in plains.
(d) October – November:
Too late; plant establishment and flowering would be poor.

S30. Ans.(a)
Sol. Black spot disease is one of the most common and serious fungal diseases affecting **rose (Rosa spp.)** plants.
Key Points:
Causal organism:
Diplocarpon rosae is the **fungus** responsible for **black spot disease** in roses.
Symptoms:
Appearance of **small, round black spots** with fringed margins on the upper surface of leaves.
Affected leaves **turn yellow** and **fall prematurely** (defoliation).
Severe infections weaken the plant, **reducing flowering** and overall plant vigor.
Management:
Regular spraying with **fungicides** like Mancozeb or Chlorothalonil.
Good **air circulation** around plants.
Removal and destruction of infected leaves.
Other Options Explained:
(b) Diplodia rosarum:
A different fungal pathogen associated with **dieback disease** in roses, not black spot.
(c) Agrobacterium tumefaciens:
A **bacterial pathogen** causing **crown gall disease** in many plants, including roses.
(d) Botrytis cinerea:
Causes **Botrytis blight (gray mold)**, affecting flowers and buds, not the black spot.

S31. Ans.(c)

Sol. ✅ (c) Application of lime to the soil:

• Panama disease is caused by Fusarium oxysporum f.sp. cubense.

• Lime raises soil pH, making conditions unfavorable for fungal growth.

• Encourages beneficial soil microflora, which suppress the pathogen.

• Combined with resistant cultivars and drainage, it's highly effective.

❌ (a), (b): Not effective on soil-borne pathogens. ❌ (d): Excess irrigation worsens Fusarium spread.

S32. Ans.(c)

Sol. ✅ (c) Antibiotics:

• Used for diseases like bacterial blight (Xanthomonas), canker, leaf spot.

• Common plant antibiotics:

Streptomycin sulfate

Oxytetracycline

• Mode of action: inhibit protein synthesis in bacteria.

• Applied via sprays or seed dips.

❌ (a): Acaricide (kills mites). ❌ (b): Effective only against fungi. ❌ (d): Viricides not practically effective in plants.

S33. Ans.(b)

Sol. ✅ (b) Tulsane brothers:

• First proposed that a single fungal species can exhibit multiple morphological forms.

• Classified as:

Anamorph – asexual form.

Teleomorph – sexual form.

• Led to a better understanding of complex fungal genera like Fusarium, Aspergillus, Penicillium.

• Basis for the "One fungus, one name" nomenclature debate in mycology.

❌ (a), (c), (d): Contributions in other areas of fungal taxonomy.

S34. Ans.(d)

Sol. ✅ (d) Both (a) and (b):

• Beauveria bassiana: Used against whiteflies, aphids, and beetles.

• Metarhizium anisopliae: Effective on termites, root grubs, locusts.

• Mechanism:

Conidia adhere to insect cuticle.

Germinate, penetrate, and kill the insect.

• Environmentally safe and compatible with IPM.

❌ (c): Trichoderma is fungicidal, not insecticidal.

S35. Ans.(d)

Sol. ✅ (d) Whiteflies (Bemisia tabaci):

• Act as persistent virus vectors of Yellow Vein Mosaic Virus (YVMV) in okra.

• Symptoms:

Yellowing along veins, which later spreads to the entire leaf.

Deformed, unmarketable fruits.

• Transmission:

Virus multiplies inside the vector and is retained for life.

• Management:

Use of resistant varieties, insecticides, and netting during seedling stage.

❌ (a), (b), (c): Not known to spread this virus.

S36. Ans.(b)

Sol. ✅ (b) Penicillium roqueforti:

• Used in blue cheeses (Roquefort, Stilton, Gorgonzola).

• Produces moldy blue-green veins in cheese.

• Adds characteristic flavor, aroma, and texture via proteolytic and lipolytic enzymes.

• Safe and edible fungal culture approved in food processing.

❌ (a), (d): Antibiotic producers. ❌ (c): Not used in food industries.

S37. Ans.(a)

Sol. ✅ (a) 4, 2, 1, 3: This is the correct and meaningful order representing the life cycle of a moth and many other insects that undergo complete metamorphosis. The sequence describes the biological stages of development from egg to adult insect:

Egg (4): This is the initial stage of the insect's life cycle. The female moth lays eggs on a suitable surface, often on leaves or plants that will serve as food for the larvae. The eggs are usually tiny, oval or round in shape. This stage involves embryonic development within the egg until hatching occurs.

Larva (2): Once the egg hatches, the larval stage begins. The larva, also called a caterpillar in moths and butterflies, is a worm-like feeding stage. Its primary function is to consume large amounts of food to store energy for the upcoming transformation. During this stage, the larva molts several times as it grows.

Pupa (1): After the larva has grown sufficiently, it transforms into a pupa or chrysalis. This is a resting or transformative stage where the larva undergoes a complete internal reorganization. The pupa does not feed but is highly active internally, as the body structures of the adult moth develop. This stage is crucial for metamorphosis, where larval tissues are broken down and adult features like wings, antennae, and legs form.

Moth (3): The final stage is the emergence of the adult moth from the pupa. The adult is fully formed with wings and reproductive organs. Its primary role is to mate and reproduce, continuing the life cycle by laying eggs to start the process again. The adult moth generally has a short lifespan compared to the larva.

❌ (b) 4, 1, 2, 3: Incorrect because the pupa stage (1) comes after the larva (2), not before. Placing pupa immediately after egg is biologically inaccurate.

✗ (c) 4, 3, 2, 1: Incorrect because the adult moth (3) cannot precede the larva (2) and pupa (1) stages. The adult emerges only at the end of the life cycle.
✗ (d) 4, 3, 1, 2: Incorrect for similar reasons; the adult stage is wrongly placed too early, and the larva stage is last, which is biologically impossible.

S38. Ans.(b)
Sol. Termites are highly destructive pests that attack all parts of a plant, including the roots, stems, and leaves. They feed on plant tissues and cause significant damage to crops, especially in areas with poor soil drainage and high humidity.

S39. Ans.(c)
Sol. The potato tuber moth (Phthorimaea operculella) tunnels into potato tubers, causing significant damage that can lead to post-harvest losses in storage.

S40. Ans.(c)
Sol. Gaseous formulations are primarily used in storage structures and seed godowns to fumigate and control pests.

S41. Ans.(b)
Sol. Nuclear Polyhedrosis Virus (NPV) is widely used as a biological control agent against Lepidopteran insects. It specifically infects the larvae of these insects, causing them to stop feeding and eventually die, reducing pest populations in crops. NPV is particularly effective in ecofriendly pest management as it is selective for target insect species and does not harm beneficial organisms or humans.

S42. Ans.(b)
Sol. Cotton is the largest pesticide-consuming crop in India due to its vulnerability to pests like bollworms and sucking insects.

S43. Ans.(c)
Sol. Agricultural economics applies the principles of economics—like resource allocation, opportunity cost, and efficiency—to agriculture. It focuses on how limited resources like land, labor, and capital are used in farming activities to produce goods efficiently. It also covers aspects like pricing, income, marketing, and policy planning in the agriculture sector.

S44. Ans.(b)
Sol. The Integrated Farming System (IFS) includes a combination of crop and allied enterprises in a coordinated manner. It utilizes internal nutrient cycling, waste recycling, and on-farm input generation, which reduces external input dependency and enhances income and sustainability.

S45. Ans.(b)
Sol. In economics, utility refers to the satisfaction or usefulness derived from consuming a product. For example, the utility of rice or wheat depends on how well it meets a consumer's need or preference.

S46. Ans.(d)
Sol. The Benefit–Cost (B:C) Ratio is a measure of profitability, calculated as Gross Return ÷ Total Cost. A ratio above 1 means gains, below 1 implies loss. It's a quick way to assess economic viability in crop planning or project selection.

S47. Ans.(b)
Sol. The WTO's Agreement on Agriculture divides subsidies into Green box (non-trade-distorting), Blue box (production-limiting), and Amber box (trade-distorting). Each has a different level of acceptability and is subject to specific reduction commitments.

S48. Ans.(c)
Sol. The correct answer is: (C) Receiver
Explanation:
Communication is the **process of transferring messages or information** from a **source (sender) to a receiver** through a channel. It involves encoding, transmission, decoding, and feedback.

- The **channel** is the medium through which the message is transmitted.
- The **receiver** is the individual or group who interprets the message.
- **Feedback** ensures the message is understood correctly.

Information Booster:
Elements of Communication Process:

1. **Sender (Source):** Initiates the communication.
2. **Message:** The information being communicated.
3. **Encoding:** Converting the message into a format that can be transmitted.
4. **Channel:** The medium used (e.g., speech, text, email, etc.).
5. **Receiver:** The person who decodes and understands the message.
6. **Feedback:** The response from the receiver to confirm understanding.

S49. Ans.(c)
Sol. Paramparagat Krishi Vikas Yojana (PKVY) promotes organic farming by encouraging traditional and chemical-free agricultural practices through financial and technical support.

S50. Ans.(c)
Sol. The first All India Coordinated Research Project (AICRP) was initiated for Maize, focusing on improving the yield and quality of maize through coordinated research efforts.

S51. Ans.(c)
Sol. ATMA stands for Agriculture Technology Management Agency. This agency focuses on promoting agricultural technologies and improving the management and extension services in the agricultural sector.

S52. Ans.(c)

Sol. The correct answer is: (C) Golden

The **Lab to Land Programme (LLP)** was launched by the **Indian Council of Agricultural Research (ICAR) in 1979** as part of its **Golden Jubilee (50 years) celebration**.

This initiative aimed to **transfer advanced agricultural research and technology to farmers** to improve productivity and rural livelihoods.

Information Booster (Additional Knowledge)

- To **bridge the gap between agricultural research and practical farming**.
- To encourage **adoption of modern farming techniques** among farmers.
- To **increase productivity and income of small and marginal farmers**.
- To provide **on-field training and demonstrations** on scientific farming.

Impact of the Programme:

- Helped in **spreading awareness about high-yielding varieties, fertilizers, irrigation, and pest control methods**.
- Promoted **self-sufficiency and sustainable agriculture** in rural areas.

S53. Ans.(c)

Sol. The Mission for Integrated Development of Horticulture (MIDH) was launched in 2014-15. This scheme aims to promote holistic growth in the horticulture sector, covering fruits, vegetables, and other related crops through area-based regionally differentiated strategies.

S54. Ans.(c)

Sol. The Correct Answer is: (C) Polynucleotide

Explanation:

DNA (Deoxyribonucleic Acid) is a **polynucleotide**, meaning it is a long chain made up of repeating units called **nucleotides**.

Each nucleotide in DNA consists of three parts: a sugar (deoxyribose), a phosphate group, and a nitrogenous base (Adenine, Thymine, Cytosine, or Guanine).

These nucleotides are linked together in a sequence to form the long, double-stranded structure of DNA.

Information Booster:

- Each strand of DNA is a **polymer of nucleotides**.
- **Polynucleotide** = many nucleotides joined by **phosphodiester bonds**.
- DNA carries **genetic information** crucial for the growth, development, and reproduction of all living organisms.

Additional Information:

- **Polysaccharide**): A polymer made of sugars.
- **Polypeptide**): A polymer of amino acids, which makes up proteins.
- **Polymerase**): An enzyme that helps in the synthesis of DNA or RNA by assembling nucleotides.

S55. Ans.(a)

Sol. Photosynthesis primarily takes place in chloroplasts, specifically in:
Thylakoid membranes – site of light-dependent reactions
Stroma – site of Calvin cycle (light-independent reactions)
Thylakoids contain:
Chlorophyll
Photosystem I and II
Other plastids:
Chromoplast – pigments other than chlorophyll
Leucoplast – storage
Matrix – found in mitochondria, not involved in photosynthesis

S56. Ans.(d)

Sol. Lipase is an enzyme that specifically catalyzes the hydrolysis of fats (lipids) into:
Glycerol and fatty acids
It is important for:
Digestion of dietary fats in humans and animals.
Other options:
Hydrolase – general class of enzymes that includes lipase, but not specific.
Catalase – breaks down hydrogen peroxide.
Amylase – breaks down starch into sugars.

S57. Ans.(b)

Sol. The process of nutrient absorption by plants through their roots in the form of ions is called osmosis. In osmosis, water and dissolved nutrients move from areas of lower concentration to higher concentration across the root membranes.

S58. Ans.(c)

Sol. Allogenic succession refers to ecological succession that is driven by external factors, such as climate or human activities, rather than by the organisms themselves.
These external conditions lead to the replacement of existing communities.
Explanation:
(a) Heterotrophic succession – Heterotrophic succession is a concept related to energy flow in ecosystems and not the replacement of communities.
(b) Autogenic succession – Autogenic succession is driven by internal factors such as the interaction among organisms themselves.
(c) Allogenic succession – Correct answer. Allogenic succession involves the replacement of a community due to external factors like climate change or human intervention.
(d) Secondary succession – Secondary succession is the process of re-establishment of a community after a disturbance, but it can be autogenic or allogenic.

S59. Ans.(a)

Sol. Chlorophyll b differs from chlorophyll a by having a formyl (–CHO) group instead of a methyl group. The carbonyl group increases polarity, making it more soluble in polar solvents.
This affects its solubility and absorption spectrum.
Correct answer: (a).

S60. Ans.(d)

Sol. The Correct Answer is: (D) **Amino acids**

Explanation:

Proteins are made up of **amino acids**, which are organic compounds consisting of an amino group (-NH2) and a carboxyl group (-COOH). These amino acids are linked by peptide bonds to form polypeptides, which fold into specific three-dimensional structures to function as proteins.
The sequence and combination of amino acids determine the specific structure and function of each protein.

Information Key Points:

- **Amino acids**: The building blocks of proteins, essential for the formation of polypeptide chains.
- **Peptide bonds**: The covalent bonds that link amino acids together in a protein.
- **Protein structure**: The unique sequence of amino acids dictates the protein's final structure and function.

Additional Information (Other Options):

- **Diamines**: Organic compounds with two amino groups.
- **Phenols**: Compounds with an aromatic ring and hydroxyl group.
- **Sugars**: Carbohydrates that provide energy.

S61. Ans.(c)

Sol. G. **Haberland** is known as the father of plant tissue culture. He pioneered the concept of totipotency, which is the ability of a single plant cell to develop into a complete plant.

S62. Ans.(c)
Sol. A test cross is used to determine the genotype of an individual showing a dominant trait.
It involves crossing the F_1 individual (dominant phenotype) with a homozygous recessive parent.
Outcomes help identify whether the F_1 individual is:
Homozygous dominant or
Heterozygous
Back-cross refers to crossing F_1 with any parent, dominant or recessive.

S63. Ans.(c)
Sol. As of now, Bt Cotton is the only genetically modified (GM) crop approved for commercial cultivation in India.

S64. Ans.(c)
Sol. ✅ (c) PCR:
• PCR (Polymerase Chain Reaction) is a technique, not a molecular marker.
• It is used to amplify DNA, but it doesn't itself serve as a marker.
• On the other hand, RFLP and RAPD are actual molecular markers used to detect polymorphisms in genomes.
❌ (a) RFLP:
• RFLP (Restriction Fragment Length Polymorphism) is a widely used molecular marker in plant genomics.
❌ (b) RAPD:
• RAPD (Random Amplified Polymorphic DNA) is also a true marker system, helpful in genetic diversity studies.
❌ (d) None:
• Incorrect because PCR is not a marker—it is a method/tool used in marker techniques.

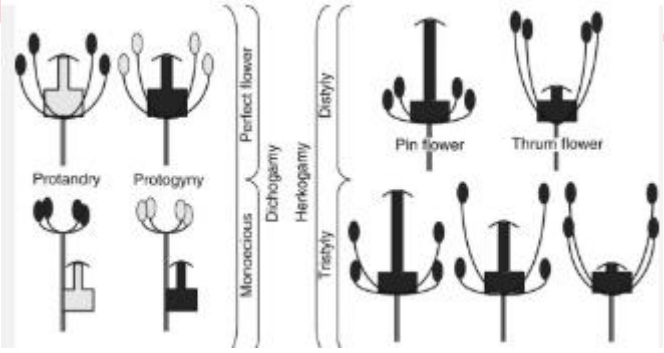
S65. Ans.(b)
Sol. ✅ (b) RFLP (Restriction Fragment Length Polymorphism):
• RFLP is a classical molecular marker technique used to analyze variations in DNA sequences.
• In plant DNA fingerprinting, genomic DNA is digested using specific restriction enzymes that cut DNA at known sequences.
• The resulting fragments are separated by gel electrophoresis and transferred onto a membrane using the Southern blotting technique.
• A labeled DNA probe, complementary to a known variable region (e.g., minisatellite DNA), is used to hybridize with target sequences.
• The pattern of bands formed helps in identifying plant varieties, characterizing germplasm, and distinguishing between cultivars based on genetic differences.
• In crops like potato and rice, RFLPs are highly effective due to sufficient polymorphism.
❌ (a) Western blot:
• Detects specific proteins, not nucleic acids.
• Irrelevant for DNA fingerprinting and genetic analysis in plants.

✗ (c) ELISA:
• Enzyme-Linked Immunosorbent Assay is a serological technique used for detecting antigens or antibodies in plant disease diagnostics.
• It does not involve DNA analysis, hence not applicable for fingerprinting.
✗ (d) qPCR (quantitative PCR):
• While qPCR is used to quantify DNA, it is not used to generate polymorphic band patterns.
• It lacks the ability to visualize multiple fragment length variants, which RFLP provides for varietal identification.

S66. Ans.(c)
Sol. The correct answer is: (C) Dichogamy
Explanation:
Dichogamy is the condition in which the stamens and pistils of a bisexual flower mature at different times. This adaptation prevents self-pollination and encourages cross-pollination.
It plays a key role in enhancing genetic diversity in flowering plants. Dichogamy is of two main types:
- **Protandry** – stamens mature before pistils (e.g., sunflower)
- **Protogyny** – pistils mature before stamens (e.g., pearl millet)

Important Key Points:
- Prevents self-pollination
- Promotes cross-pollination
- Common in bisexual (hermaphrodite) flowers

Knowledge Booster :
- **Cleistogamy (A):** self-pollination occurs within closed flowers. Common in plants like Viola and Commelina.
- **Dioecy (B):** Male and female flowers are borne on separate plants. Seen in papaya, date palm, and spinach.
- **Dicliny (D):** Male and female flowers are morphologically separate. It includes both monoecious (same plant, e.g., maize) and dioecious (separate plants, e.g., papaya) conditions.



S67. Ans.(c)
Sol. The correct answer is: (C) Immature embryo
Seed dormancy is a condition where a seed **fails to germinate despite favorable environmental conditions**.
One of the primary reasons for dormancy is the **immaturity of the embryo**, meaning the seed has not fully developed and requires additional time or specific conditions before it can germinate.

Information Booster:

- **Embryo dormancy** happens when the embryo is **underdeveloped or physiologically inactive**.
- Some seeds require **cold stratification, after-ripening, or hormonal changes** to break dormancy.
- Common in **apple, cherry, and some grasses** where seeds mature post-harvest.

Knowledge Booster:

- **Presence of pathogens:** Pathogens may cause **seed rot, fungal infections, or reduced germination**.
- **Cracking of hulls:** Dormancy often results from **hard seed coats that prevent water absorption** (e.g., legumes like peas and beans).
- **Green distortion:** Distortion in seedling growth can be due to **nutrient deficiencies, genetic defects, or environmental stress**.

S68. Ans.(b)

Sol. Orthodox seeds can withstand drying to low moisture content and can be stored at low temperatures without losing their viability.

Examples include rice, wheat, and maize seeds.

In contrast, Recalcitrant seeds (e.g., mango, jackfruit) cannot tolerate drying and low temperatures.

Proper seed storage is essential to maintain seed viability for future use.

S69. Ans.(c)

Sol. Gibberellins (GA) are plant hormones used for breaking seed dormancy.

They stimulate enzyme production that mobilizes stored food reserves in seeds, initiating germination.

GA is widely used in agriculture and horticulture to promote seed germination, flowering, and fruit development.

It is particularly effective for seeds with hard seed coats or requiring specific environmental triggers to germinate.

S70. Ans.(d)

Sol. Abscisic acid (ABA) inhibits seed germination by inducing dormancy, which is later broken by gibberellins.

S71. Ans.(a)

Sol. Seed Selection is not a part of post-harvest handling of seed crops. The other activities like threshing, drying, and grading are essential post-harvest steps.

S72. Ans.(a)

Sol. Natural regeneration is the renewal of a forest **without human intervention**, through:

Self-sown seeds

Coppice shoots

Root suckers

It ensures **biodiversity conservation** and cost-efficiency.

S73. Ans.(c)

Sol. The correct answer is: (C) Home garden

Explanation:

Home gardens are one of the oldest forms of agroforestry, where both agricultural crops and trees are cultivated around the homestead. This practice has been followed for centuries in various cultures across the world,

offering multiple benefits such as food security, biodiversity conservation, and environmental sustainability. It integrates food crops, medicinal plants, and timber species in a small area, usually close to the home, making it a highly sustainable agroforestry system.

Information Key Points:

- **Home gardens** involve the cultivation of multiple crops and trees around the homestead.
- They are **sustainable** and provide food security, timber, and medicinal plants.
- A traditional agroforestry practice that integrates **agriculture and forestry** at a domestic level.

Knowledge Booster (Other Option Information):

- **Alley cropping**: This is a modern agroforestry system where crops are grown in rows between tree alleys. It is less ancient than home gardens and is designed for soil conservation and improved yields.
- **Taungya system**: This agroforestry system involves growing crops in forests during the early stages of tree plantation.
- **Shifting cultivation**: As mentioned earlier, this is the oldest agricultural practice where forest land is cleared for cultivation.

S74. Ans.(a)

Sol. The correct answer is: (A) Jamunapari

Jamunapari is the largest breed of goat in India. It is well known for its large size, high milk yield, and adaptability to various climatic conditions.

Originating from Uttar Pradesh, this breed is primarily used for milk production and meat purposes. The body is large with long legs, drooping ears, and a distinctive convex face.

Information Booster:

- Origin: Etawah district, Uttar Pradesh
- Weight: Males can weigh up to **65-85 kg**, while females can weigh **45-60 kg**
- Milk Yield: **2-3 liters per day**
- Distinctive Feature: **Roman nose and long ears**
- Used for: **Milk and meat production**

Knowledge Booster :

Surti:

- Origin: Gujarat, Smaller in size compared to Jamunapari
- Milk yield: **1.5-2 liters per day,** Primarily a **dairy breed**

Mehsana:

- Origin: Gujarat, Medium-sized goat breed
- Milk yield: **1.5-2 liters per day,** Used for both **milk and meat production**

Marwari: Origin: Rajasthan, Well adapted to **hot and dry conditions Used primarily for meat production.**

S75. Ans.(b)

Sol. The correct answer is: (B) Angora goats

Explanation:

Mohair is a **luxurious fiber** obtained from **Angora goats** (Capra aegagrus hircus). It is **soft, silky, and durable**, making it highly valued in the textile industry.

- **Production regions:** The leading producers of mohair are **Turkey, South Africa, and the United States (mainly Texas)**.
- **Fiber properties:** Mohair is known for its **shine, strength, and elasticity**. It is often blended with wool to enhance its softness and durability.
- **Uses:** It is widely used in **high-quality fabrics, scarves, shawls, suits, and upholstery**.

Knowledge Booster :

- **Merino:**
  - Merino sheep are primarily found in **Australia and New Zealand**.
  - Used in **thermal wear, activewear, and fine clothing**.
- **Nagori:**
  - it is a **cattle breed** from **Rajasthan, India**, known for its **strong build and use in agriculture**.
- **Mehsana:**
  - **Indian buffalo breed**). Popular for **high milk yield** in Gujarat.

S76. Ans.(c)

Sol. The correct answer is:**(C) Ewe**

Explanation:

An **adult female sheep** is called an **ewe**. The term is specifically used to refer to a female sheep that is older than one year. Ewes are typically reared for **wool production** and **breeding** purposes in sheep farming.

Important Points:

- A **ewe** is an adult female sheep, usually **over one year old**.
- The male sheep is called a **ram**, and a **young sheep**(either male or female) is known as a **lamb**.
- Ewes are important for their **reproductive roles** in sheep farming and are also valued for their **wool**.

S77. Ans.(d)

Sol. Ranikhet disease (Newcastle disease) is a **viral infection** in poultry.

Symptoms include **respiratory distress, greenish diarrhea**, and **drop in egg production**.

Other options are caused by **protozoa or fungi**.

S78. Ans.(b)

Sol. What is Silage?

Silage is the product of anaerobic (absence of air) fermentation of green plant material.

It is commonly made from crops like maize, sorghum, or grass.

The goal is to preserve the feed for livestock in times when fresh forage is not available.

Other Options:

❌ Hay – Dried plant material (not fermented).

❌ Straw – Dry stalks left after grains are harvested; low in nutrition.

❌ Lint – Cotton fiber; unrelated to forage or fermentation.

S79. Ans.(a)

Sol. ✓ Indigenous Milch Breeds of India:

Red Sindhi, Sahiwal, and Tharparkar are traditional Indian dairy (milch) breeds.

Red Sindhi – Origin: Sindh region (now in Pakistan)

Tharparkar – Origin: Thar Desert (Rajasthan)

Sahiwal – Origin: Punjab region

✓ About Jersey:

Jersey is an exotic breed of dairy cattle originating from the Jersey Island (UK).

Known for high butterfat content in milk, but not indigenous to India.

✓ Final Conclusion

Jersey is not an Indian breed.

S80. Ans.(b)

Sol. The Correct Answer is: B. 3 – 7

Explanation

The incubation period of **Rinderpest** disease (also known as cattle plague) is typically **3 to 7 days**. During this time, the infected cattle may not show visible symptoms, but the virus is actively multiplying. After this period, clinical signs such as fever, nasal discharge, diarrhea, and erosions in the mouth start appearing.

Information Key Points

- Rinderpest is caused by a **Morbillivirus**.
- It is a **highly contagious viral disease** of cattle.
- Incubation period: **3 to 7 days**.
- It was declared **globally eradicated in 2011** by the FAO and OIE.

S81. Ans.(b)

Sol. The correct answer is (b) "Bright products. Dark intentions. Unmasking the Appeal."

- The theme for World No Tobacco Day 2025 is "Bright products. Dark intentions. Unmasking the Appeal."
- Observed annually on 31st May by WHO.
- Aims to highlight the deceptive marketing tactics of the tobacco industry.
- Seeks to protect current and future generations from tobacco harm.
- Promotes quitting and public education on tobacco risks.

Information Booster:

- Tobacco kills over 8 million people annually worldwide.
- It is the leading cause of preventable death globally.
- WHO supports policies for tobacco control and youth protection.
- Campaigns focus on education, regulation, and cessation support.

S82. Ans.(b)

Sol. The correct answer is (b) May 28; Empowering communities for sustainable food security

- World Hunger Day is observed annually on **May 28**, launched by The Hunger Project in 2011.
- The day emphasizes **long-term, sustainable solutions** to hunger rather than temporary relief efforts.
- It focuses on **empowering communities**, particularly smallholder farmers and women, to break the cycle of poverty and hunger.
- World Hunger Day 2025 highlights the importance of climate-resilient agriculture, gender equality, and local development initiatives.
- It aligns with the United Nations Sustainable Development Goal 2 (Zero Hunger) aiming for food sovereignty and resilience.
- Information Booster:
- Over 800 million people worldwide suffer from chronic hunger and food insecurity.
- The Hunger Project advocates for education, healthcare, climate action, and economic opportunity as tools against hunger.
- Participation includes supporting local farmers, advocacy, fundraising, and urging policy changes.
- The approach challenges traditional food aid models, promoting empowerment over dependency.
- World Hunger Day encourages global awareness combined with local actions.

S83. Ans.(c)

Sol. The correct answer is (c) New Delhi

- The **Panchayat Advancement Index (PAI) 2.0** was officially launched during a **two-day National Writeshop** held on **26–27 May 2025** at the **Dr. Ambedkar International Centre, New Delhi**.
- This event was organized by the **Ministry of Panchayati Raj (MoPR)** to promote data-driven governance in rural areas.
- PAI 2.0 aims to empower **Gram Panchayats** with better tools for planning, monitoring, and governance aligned with **Localized Sustainable Development Goals (LSDGs)**.
- The writeshop involved participation from **32 states and UTs**, multiple government departments, experts from NITI Aayog, UNICEF, UNFPA, and other development partners.
- The event was livestreamed in **11 Indian languages**, reflecting linguistic inclusivity.

Information Booster:

- PAI 2.0 reduced indicators from **516 to 147** to improve data quality.
- Introduced tools like a **mobile-friendly portal, LIF booklet, SOPs, and Decision Support System (DSS)**.
- Covers 9 themes including **poverty alleviation, health, education, water, environment, infrastructure, governance, social justice, and women's empowerment**.
- Supports **transparent and decentralized rural governance**.
- Previous version, PAI 1.0, was the baseline for measuring Gram Panchayat performance in FY 2022–23.
- Event was inaugurated by senior officials including Secretaries of MoPR and MoSPI.

Additional Information:

- Dr. Ambedkar International Centre is located in **New Delhi**.
- Ministry of Panchayati Raj focuses on strengthening **local self-government institutions**.
- NITI Aayog and other partners provide technical and policy support.
- Livestreaming in multiple languages ensures **wider accessibility and participation**.

S84. Ans.(c)

Sol. This scheme is a health insurance program specifically designed for Assam Government employees and pensioners to cover medical expenses.

S85. Ans.(c)

Sol. The correct answer is: (c) Droupadi Murmu

Explanation:

- The **President of India, Droupadi Murmu**, presented the National Florence Nightingale Awards 2025 at **Rashtrapati Bhavan**, New Delhi, to honor the services of nursing professionals across India.

Information Booster:

- Droupadi Murmu is the 15th President of India.
- The awards recognize service in healthcare delivery.
- Ceremony held in May 2025 at Rashtrapati Bhavan.
- 15 professionals were awarded from various states.
- Awards instituted by Ministry of Health & Family Welfare.

Additional Information:

- **(a)** PM Narendra Modi leads healthcare reforms but did not confer this award.
- **(b)** Jagat Prakash Nadda attended the event as Health Minister.
- **(d)** Anupriya Patel is MoS in MoHFW but not the presenter.

S86. Ans.(b)

Sol. The correct answer is (b) Princess of Asturias Award for Sports.

- Serena Williams was honored with the Princess of Asturias Award for Sports in 2025, recognizing her exceptional achievements and global impact on tennis.
- This prestigious award celebrates individuals and organizations whose work in sports has brought distinction and inspired society worldwide.

Information Booster:

- The **Princess of Asturias Awards** are among Spain's most prestigious honors, established in 1981 by the Princess of Asturias Foundation.
- These awards recognize excellence in fields such as arts, literature, communication, science, and sports.
- The Sports category honors athletes or teams demonstrating outstanding sporting achievements, sportsmanship, and contributions to society.
- Past recipients include iconic figures like Lionel Messi (2019), Novak Djokovic (2015), and the Spanish national football team (2010).
- The award ceremony is held annually in Oviedo, Spain, and features international dignitaries and cultural events.

About Serena Williams:

- Serena Williams is considered one of the greatest tennis players in history, with **23 Grand Slam singles titles**, the most by any player in the Open Era.
- Born in 1981 in the USA, she turned professional in 1995 and dominated women's tennis for over two decades.
- Serena has won four Olympic gold medals—one in singles and three in doubles with her sister Venus Williams.
- Beyond tennis, she is an advocate for women's empowerment, social justice, and philanthropy.
- Her powerful playing style, resilience, and off-court activism have made her a global icon in sports and beyond.

S87. Ans.(c)

Sol. The correct answer is (c) Mary Earps.

- Mary Earps is a renowned English football goalkeeper.
- She announced retirement from international football in 2025.
- She has been a key player for England's national team.
- Retirement announcements typically follow major tournaments or seasons.
- Earps' career has inspired many aspiring female athletes.

Information Booster:

- Mary Earps played in the UEFA Women's Euro and FIFA Women's World Cup.
- England's women's football has grown rapidly in popularity.
- Female footballers gain increasing recognition globally.

S88. Ans.(b)

Sol. The correct answer is (b) Kush Maini.

- Kush Maini became the first Indian to win a Formula 2 race by securing victory at the Monaco Grand Prix Sprint Race on May 24, 2025.
- Driving for Dams Lucas Oil, he led all 30 laps from pole position, demonstrating a flawless performance.
- This historic win marks a significant milestone for Indian motorsport and showcases the country's rising presence in global racing.

Information Booster:

- Kush Maini is a reserve driver for the BWT Alpine F1 team and hails from Bengaluru, India.
- The reverse-grid Sprint Race format allowed him to start on pole after finishing 10th in qualifying.
- He is supported by JK Racing and TVS Racing, which have played key roles in his development.
- Kush's win is seen as a breakthrough for Indian motorsport on the global stage.
- He is the younger brother of Arjun Maini, another prominent Indian racing driver.

S89. Ans.(c)

Sol. The correct answer is (c) Mehidy Hasan Miraz.

- Mehidy Hasan Miraz, Bangladesh's premier all-rounder, was awarded the ICC Men's Player of the Month for April 2025.
- This was his first time receiving this prestigious recognition.
- The award recognized his outstanding all-round performance in a two-match Test series against Zimbabwe.

- He scored 116 runs with a batting average of 38.66 and took 15 wickets at a bowling average of 11.86.
- He was chosen over other nominees Blessing Muzarabani (Zimbabwe) and Ben Sears (New Zealand).
- Miraz became only the third Bangladeshi cricketer to win this award after Mushfiqur Rahim and Shakib Al Hasan.
- His achievement highlights Bangladesh's growing prominence in international cricket and the importance of all-rounders in Test cricket.

Information Booster:

1. Mehidy Hasan Miraz is a 27-year-old all-rounder from Bangladesh known for his spin bowling and useful batting.
2. The ICC Men's Player of the Month award is given monthly by the International Cricket Council to the best-performing male cricketer worldwide.
3. Miraz's performance included a century and a five-wicket haul in the same Test, a rare feat for all-rounders.
4. Mushfiqur Rahim and Shakib Al Hasan, other Bangladeshi winners, are among the country's cricket legends.
5. Bangladesh cricket has improved significantly in the last decade, producing world-class players.
6. All-rounders like Miraz play a vital role in balancing the team in Test matches.
7. The ICC award also recognizes consistency and impact in international cricket performances.

S90. Ans.(b)

Sol. The 9th Asian Winter Games were held in Harbin, China, from February 7 to February 14, 2025.This marked the second time Harbin hosted the event, the first being in 1996.The Games featured 64 events across 11 sports, with ski mountaineering making its debut.A record 34 countries and regions participated, surpassing the previous high set at the 8th Asian Winter Games in Sapporo, Japan in 2017.

Information Booster:

- The 9th Asian Winter Games took place in Harbin, China, from February 7 to February 14, 2025.
- A record 34 countries and regions participated in the Games.
- The Games featured 64 events across 11 sports, including the debut of ski mountaineering.
- China topped the medal table with 32 gold, 27 silver, and 26 bronze medals.
- The Philippines secured its first-ever Asian Winter Games medal, a gold in men's curling.
- Harbin is known as the "Ice City" and has a rich history in winter sports.

Additional Information:

- **Japan**: Japan hosted the 8th Asian Winter Games in 2017 in Sapporo and Obihiro.
- **India**: India has not hosted the Asian Winter Games.
- **South Korea**: South Korea hosted the 4th Asian Winter Games in 1999 in Gangwon

S91. Ans.(b)

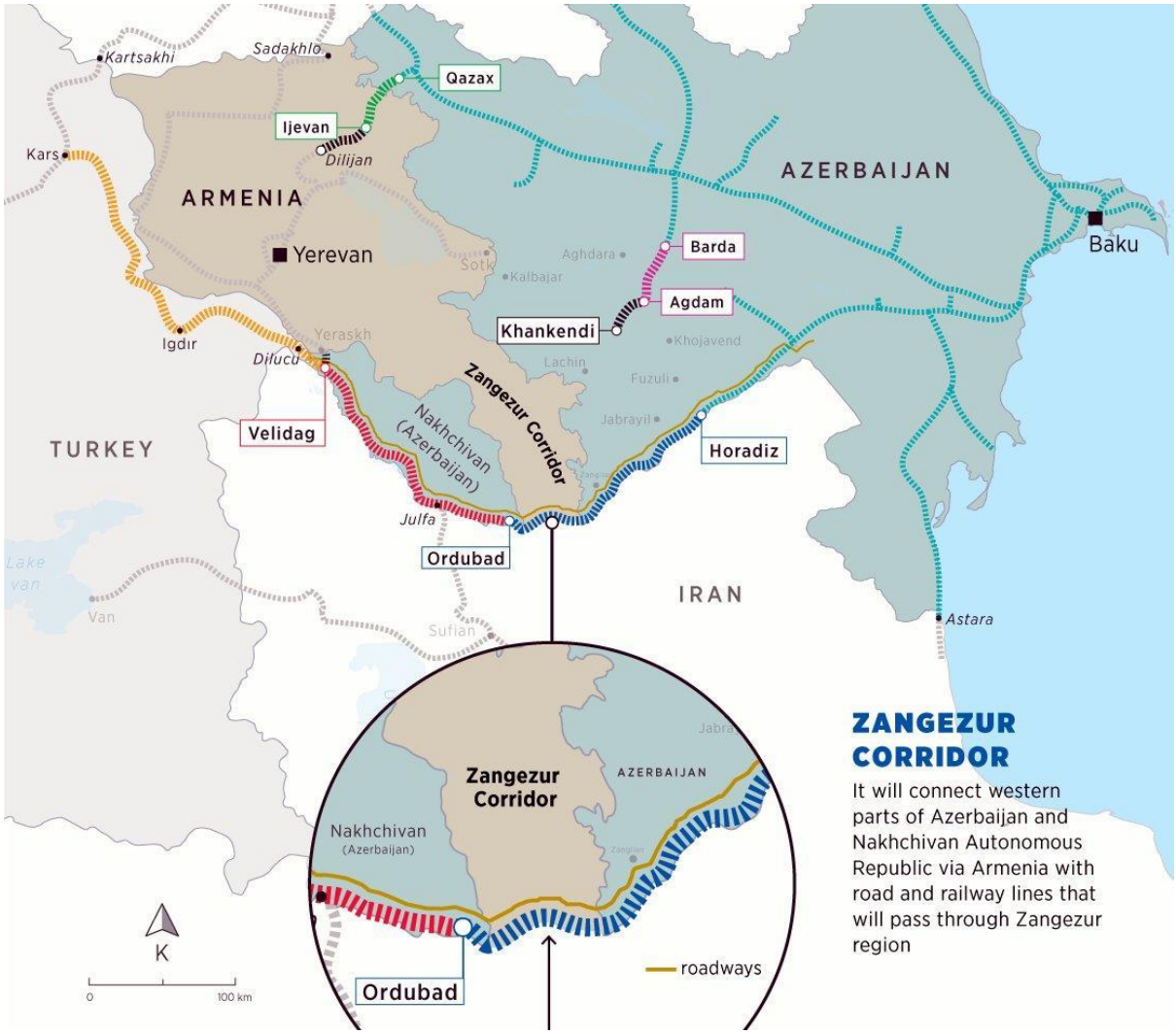
Sol. The correct answer is option (b) Zangezur Corridor

Explanation

The peace treaty negotiations between Armenia and Azerbaijan include the establishment of the Zangezur Corridor.

This corridor is intended to create a transport and communication link between Azerbaijan and its exclave Nakhchivan by passing through southern Armenia.

The corridor aims to improve connectivity and economic cooperation between the two countries, fostering regional stability and peace after decades of conflict.
Its establishment is a significant part of the peace process, as it would enable Azerbaijan direct access to Turkey and other regional partners, while also potentially opening new avenues for trade and transit in the South Caucasus.



Information Booster
The corridor is part of peace negotiations between Armenia and Azerbaijan.
Connects Azerbaijan to its exclave Nakhchivan through Armenia.
Aims to enhance regional connectivity and trade.
Supports peace and stability in the South Caucasus region.
Facilitates Azerbaijan's access to Turkey and beyond.
Critical for economic and geopolitical cooperation.
Additional Knowledge
(a) Khyber Corridor: A historic pass between Pakistan and Afghanistan, unrelated to Armenia-Azerbaijan talks.
(b) Zangezur Corridor: A strategic land corridor proposed to connect Azerbaijan with Nakhchivan via Armenia; central to current peace treaty discussions.
(c) Durand Corridor: Not an official corridor; linked to the Durand Line border between Pakistan and Afghanistan.
(d) Suez Corridor: Refers to the Suez Canal area in Egypt, unrelated to the Caucasus region.

S92. Ans.(b)

Sol. The correct answer is option (b) Algeria

Explanation

Algeria has recently become a member of the New Development Bank (NDB), a multilateral development bank established by the BRICS countries (Brazil, Russia, India, China, and South Africa). This development marks an important expansion of the bank's influence into North Africa.

The NDB focuses on financing infrastructure and sustainable development projects in emerging economies, providing an alternative to Western-dominated financial institutions like the International Monetary Fund (IMF) and the World Bank. Algeria's membership enhances the bank's geographic reach and opens new avenues for financing economic development within Algeria and the broader North African region.

Information Booster

The New Development Bank was founded in 2014 by BRICS countries.

Algeria is the first North African member of the NDB.

The bank finances infrastructure and sustainable development projects.

NDB offers loans with fewer conditionalities compared to traditional lenders.

Algeria's membership expands NDB's influence in Africa.

The move promotes South-South cooperation in global development finance.

Additional Knowledge

(a) Nigeria: A major African economy but has not recently joined the NDB. It is engaged in other international financial collaborations.

(b) Algeria: The recent addition to the NDB, marking a key strategic expansion of the bank's influence into North Africa.

(c) Egypt: A significant regional power but not a recent member of the NDB.

(d) South Africa: One of the founding BRICS countries and a founding member of the NDB.

S93. Ans.(c)

Sol. The correct answer is option (c) Denmark

Explanation

In **2025**, **Denmark** assumed the **rotating chairmanship of the Arctic Council**, taking over from **Norway**. The **Arctic Council**, formed in **1996**, is a key intergovernmental forum that facilitates cooperation among Arctic nations and Indigenous communities to address issues such as **climate change, sustainable development, biodiversity, and Indigenous rights**.

Denmark holds a unique and influential position in the Arctic due to its governance over **Greenland** and the **Faroe Islands**, both of which are key geopolitical and environmental regions in the Arctic. The 2025 chairmanship transition occurs at a **time of heightened geopolitical sensitivity**, notably as **U.S. President Donald Trump has renewed discussions on annexing Greenland** — a move that has raised concerns over sovereignty, resource control, and strategic military interests in the Arctic.

Denmark's agenda during its chairmanship is expected to emphasize **climate resilience**, scientific collaboration, peace, and Indigenous engagement, even as geopolitical rivalries continue to strain Arctic cooperation.

Information Booster

Denmark became Arctic Council chair in **2025**

Took over from **Norway** (2023–2025 term)

Arctic Council was formed in **1996**

Focuses on **climate, environment, and Indigenous rights**

Includes **8 Arctic nations**, with rotating 2-year chairmanship

U.S. geopolitical interest in **Greenland** adds to Arctic tensions

Additional Knowledge

(a) Canada: Founding Arctic Council member and previous chair, but **not current chair** in 2025.

(b) Sweden: Arctic Council member; last held chairmanship from **2011–2013**.

(c) Denmark: **Correct answer.** Holds the **2025–2027** chairmanship. Plays a pivotal role due to its ties to **Greenland**, a territory at the center of Arctic sovereignty debates, especially amid renewed **U.S. annexation interest under Donald Trump**.

(d) Russia: Was chair from **2021–2023**, but its role has become diplomatically sensitive due to its **Ukraine conflict**, leading to suspended cooperation with several Arctic nations.

S94. Ans.(b)

Sol. The correct answer is option (b) Balochistan

Explanation

Balochistan, the largest province of Pakistan by area, was recently **declared independent by local leaders and activists**, most notably **Mir Yar Baloch**. This symbolic declaration was made through a series of public statements and social media posts amid heightened tensions between India and Pakistan, particularly after India's **Operation Sindoor** on May 7.

Mir Yar Baloch, a well-known Baloch activist, made the declaration via platform **X (formerly Twitter)** and appealed to:

The **United Nations** to deploy peacekeeping forces in Balochistan,

The **Indian government** to allow the establishment of a **Baloch embassy in New Delhi**, and

The **Pakistani military** to **withdraw from the region**.

Though the declaration holds no legal recognition internationally, it brings to light the ongoing **Baloch nationalist movement**, which has long protested against **economic exploitation**, **human rights violations**, and **political marginalization** by the Pakistani state.

This symbolic independence declaration signals a **continuation of the decades-old Baloch separatist struggle**, further complicating regional geopolitics and drawing international attention to the cause.

Information Booster

Region declared independent: **Balochistan**

Declared by: Local leaders, including **Mir Yar Baloch**

Platform: Social media (X)

Key Demands: UN intervention, Indian support, Pakistani army withdrawal

Background: Long-standing issues of insurgency and state repression

Strategic Importance: Rich in gas, minerals, and part of the **China-Pakistan Economic Corridor (CPEC)**

Additional Knowledge

(a) Sindh While Sindh has witnessed nationalist sentiment (e.g., **Sindhudesh movement**), no such declaration of independence has been made recently by Sindhi leaders.

(b) Balochistan Correct answer. Baloch leaders, including Mir Yar Baloch, declared it independent in a symbolic move. The province has long faced **violent suppression of autonomy demands**, and its struggle is a major internal security issue for Pakistan.

(c) Gilgit-Baltistan Although Pakistan has proposed making Gilgit-Baltistan a full province, the region has **not declared independence** through local leadership.

(d) Khyber Pakhtunkhwa There has been **no recent independence declaration** from this region. It faces cross-border militancy issues but no mainstream separatist movements like Balochistan.

S95. Ans.(a)

Sol. The RBI uses quantitative methods (e.g., CRR, SLR) and qualitative methods (e.g., moral suasion) to control credit in the economy.

S96. Ans.(a)

Sol. 'Mitra Yojana' is a scheme specifically designed to support and develop small enterprises, providing them with financial and technical assistance.

S97. Ans.(b)

Sol. The GROW report and portal aim to map wastelands and prioritize their use for agroforestry, promoting sustainable land management.

S98. Ans.(c)

Sol. The Agricultural Insurance Company of India Limited (AICIL) is responsible for implementing the National Agricultural Insurance Scheme (NAIS) to provide risk coverage to farmers.

S99. Ans.(c)

Sol. NABARD runs schemes like Agriclinic and Agribusiness Centres Scheme, which aim to support rural entrepreneurs and agricultural businesses.

S100. Ans.(a)

Sol. CAD (Computer-Aided Design) is commonly used for digitization in geoinformatics as it enables precise mapping and design of spatial data.