BT401 – GENETIC RESOURCES & CONSERVATION

ALL OBJECTIVEs & SUBJECTIVEs FROM PAST FILES FOR MID TERM

[redacted] | : ARHAM (+923351328979) | : AIZA WRITES

OBJECTIVEs

1. Natural selection will always result in the_____That Gives An Advantage To Its Possessor _____**Selection Of Allele**
2. Gene flow blocked by physical barriers_____**Allopatric Speciation**
3. Pakistan in kinow production is at _____**6th numbers**
4. Tigers of migration_____**All**
5. Themes of genetic resources_____ **2**
6. Himalayan brown bear ----------**150 _200**
7. How many categories of gene flow_____ **2**
8. Cryopreservation in liquid nitrogen occurs _____ **At _ 196 Degree**
9. Breeding type that is not released to half sister brother and cousins____ **Close Breeding.**
10. The strongest effect of genetic drift on _____ **Small Population .**
11. Honey bee pollinates how much plants_____**250,000 Species Of Plants**
12. Reason for crustacaens migration**?** _____**For Breeding**
13. Sterculla khasiana was endemic tree of____ **Khasi Hills In Meghalaya In India.**
14. Phenylketonuria caused by _____**Mutation.**
15. Population bottleneck in 1890s due to_____ **Overhunting.**
16. Plant genetic resources are the building blocks and fundamental not only in _____but also for the very survival of the species in the time and space _____**Crop Improvement Program.**
17. Biologists suspect we are living through the__mass extinctio**n** _____ **Sixth Major.**
18. ____is a pioneer species easily regenerated from seed**.** ___**Acacia Nilotica**
19. Sheep was domesticated by humans in _____ **10,000bc.**
20. **A**llele frequency affected by _____ such as mountain “gene flow ‘inbreeding* **natural** selection” founder effect?_____**Evolutionary Mechanism**
21. PGRA stands fo**r** ____**Plant Genetic Resources For Food And Agriculture.**
22. Which of the following Is the earliest modern protected area?__ **Yellow Stones National Park.**
23. Which involves storage in high and low temperature _____ **Cold Storage**
24. Migration involves following type of hazards,_____ **2 Type Natural Hazards And Anthropogenic Hazards To Migration.**
25. Bees are responsible for pollinations_____ **250,000 Species.**
26. Mild form of breeding _____**Line Breeding.**
27. Gene bank is a type of _____ **Ex_Situ Conservation.**
28. Animals genetic resource reffered as_____**All**
29. NCCP stands for _____ **National Culture Collection Of Pakistan**
30. Type of interbreeding__**3.(1.Close Breeding 2.Mild Breeding 3.Line Breeding.)**
31. Darwin finchis is example of._____ **Adaptive Radiation.**
32. **Ca**use behind extinction of steller sea cow_____ **Hunting.**
33. Calypha belongs to family___spurge family___**Euphorbeaceae / Spurge Family**

[redacted] | : ARHAM (+923351328979) | : AIZA WRITES

34. Longest migration was observed in _____ **Arctic Term Bird**
35. Which disease spread due to consuming mercury poisoned fishes by people _____**Minamata**
36. GSPC was founded in _____**1999.**
37. According to FAQ species of mollusk are _____**85000**
38. Peste de petites ruminants also known as _____ **Sheep And Goat Plaque**
39. Conservation of plant genetic resource is necessary for _____**Food Security And Agro Biodiversity Both A&B**
40. Result of environment and human change _____ **Bottleneck Effect**
41. Orthern areas of Pakistan serving as _____**Habitat**
42. Which of the following approach can be taken to analyze GxE interaction_____**. Polygenic .**
43. Wilde beest are the part of _____ **Great Migration**
44. Extinction rate of mammals _____**20%**
45. The tecopa pupfish was native to the _____ **Mojava Desert**
46. Sigillaria was a tree _____ **Spore Bearing.**
47. Which species is easily regenerated _____ **Acacia Nilotica.**
48. Population of Himalayan Geneticbear_____ **150-200 In Pakistan**
49. Genetic diversity is the variation of individual _____ **Amount Of Genetic Information.**
50. Extinction rate of mammals _____ **20%.**
51. Example of extinct species _____**Passenger Pigeon, White Rhino**
52. Land race is known as _____ **Weed, Mutant, Cultivater, Primitive.**
53. Which Is used to protect individuals in protected environment _____ **In Situ.**
54. Which is used on large scale for food and agriculture_____ **Sheep.**
55. Phenyl ketonuria is generation caused by _____ **Mutant.**
56. Plant genetic resources are building and fundamental not only in ____ but also for the very survival of species in time and space, _____ **Crop**
57. Which is example of in situ _A ___ **National Park, Biosphere, Gene Bank ..All**
58. ABSA stands for _____**Access And Benefit Sharing Agreement.**
59. In 19" century only elephant seales were present _____**20**
60. Reef are home to _____ % marine animals --------**25**
61. Gene pool types _____**3**
62. Crow follow migration, ,_____**Daily**
63. **Dwarf** lake iris appearance _____ **Deep Blue**
64. The process of cooling where the water in the tissue becomes glass rather than crystals._____ **Vitrification**
65. Cryopreservation is applicable to fishery medical animal-husbandry ____ **All**
66. Cause of extinction climate change hunting population _____**All**
67. Yellow stone national park designed _____ **1872**
68. Sea cow hunted to extinction _____ **1768**
69. Extinct plant fill cultivated in capacity is____**Cynea Superba**

70. **Br**eeding line hav**e** _____ **Narrow Genetic Base**
71. Cause of extinction _____**Climate Change Hunting, Pollution All.**
72. **Cryopreservation** is one in low temperature and deep at freezing _ **80 Degree**
73. **S**pecies in danger extinction are _____ **Endangered.**
74. Transfer of gene from parent to offspring _____ **Vertical Transfer Of Gene.**
75. How many species of animals are in danger:_____ **20,000**
76. **Fo**r which purpose the crustacean can migrate _____**Mating**
77. Microorganisms are _____;diversity than other living things _____ **Highest.**
78. GEWIS stand for __ **A Genome Wide Interaction Scan.**
79. **D**art poison frogs have compound _____ **Alkaloid**
80. Dwarf lake iris appearance _____ **Deep Blue.**
81. Together with the components which fulfill agri-ecological functions genetic .reason are grouped under the concept _____ **Agro Biodiversity.**
82. PGR are components of.....which sustain the humankind biodiversity__ **Biodiversity**
83. __ Is a keystone species A :grizzle bear ,B Pyremean ibex ,C :Snow leopard ,D : sea mink.._ ___**Grizzle Bear**
84. ------- cannot penetrate the cell membrane ---------- **Sugar.**
85. ---------- is a rare treat for the eyes _____**Hart's Tongue Fern.**
86. Genes can be transferred sexually or asexually —— **Vertical Transfer**
87. Sub species of black rhino was declared extinct in:_____**2011**
88. The last member of passenger pigeon, named, … died at age 29 at the Cincinnati Zoo in 1914._____ **Martha.**
89. Gene transfer b/w different species occur in:___**Horizontal Gene Transfer**
90. Genetic drift shows changes in the genome that may be: --- **Advantageous , Deleterious, May Have No Effect, All**
91. Scientific name of house cat: _____**Felis Catus**
92. Scientific name of horse:_____**Equus Ferus**
93. Population bottleneck in 1890s due to:_____ **Overhunting**
94. Natural selection shows … change in genome._____**Positive**
95. Living genetic resources such as seed or tissue that are maintained for the purpose of animal and plant breeding are called _____ **Germplasm.**
96. Scientific name of Marco Polo sheep: _____**Ovis Ammon**
97. Migration is … occur for the survival of anima**ls**____**Behavioral Adaptation.**
98. **A**ccording to the IUCN extinction rate of amphibians is**:**_____**25-30%**
99. **B**ubal Hartebeest which had extinction was an _____**Animal**
100. **C**ombination of all the genes present in a given population:_____**Gene Pool**
101. The Pitcher's thistle grows for … years before it flowers**.**_____**5-8**
102. _____**is t**he reduced biological fitness in a given population as a result of inbreeding or **b**reeding of related individuals _____ **Inbreeding Depression**

103. **A** group of domestic animals with a homogeneous appearance:_____ **Breed**
104. Main cause of Meleda disease------- **Disruption Or Changes Of The ARS Genes Located On The Long Arm (Q) Of Chromosome (8).**
105. Salmon moves to … for spawning.____**River**
106. Mating of relatives beyond 2nd & up to 6th generation: _____**Mild Inbreeding**
107. Nagoya protocol retified by_____ parties _____**97**
108. Climate change may however cause range expansion is ___ **Herbivore Insects**
109. _____:are preserved by cryopreservation method _____**Genetic Material**
110. Which one of the following is culturally influenced In natural reser**ve**___ **Cave Dwelling**
111. Genetic resources for food, agriculture and forestry includ**es**_____ **Both Wild And Domesticated Species**
112. Earthworms, ants and termites, have been described as.___**Ecosystem Engineers**
113. The main objective of category v Is ----------**. To Main A Balanced Interaction Of Nature And Culture**
114. Hingol national park was declared reserved **in**_____**1988**
115. Which species has been introduced in Lal Suhanra National park __**Black Buck**
116. Anthropogenic climate change leading to future large-scale dieback in_____ **Amazonian Rain Forest.**
117. National park spreading in an area of ---------- **100 Sq. Km. To 500 Sq. Km.**
118. Pollinator are major group of invertebrates. -------- - **Second**
119. insects pollinate how much plant species_____**35%**
120. Dolphin is a _____ **Mammal**
121. Ramsar convention came into _____**21 December1975**
122. % of 5488 mammal species and 12 out of 9.990 bird species are considered to be change _____**21%**
123. WCPA stands for _____**World Commission On Protected Area**
124. In Europe one estimate put the role of value marketed _____ non wood goods from Forest at _____ **2.3 Billion**
125. Natural selection effects o**n**_____ **Ecosystem.**
126. Animal Genetic resources reffered to as _____**All**
127. The frequency of gene pool can be affected by_____ **All of Them**
128. Peste de petits ruminants (PPR), also known as__**Sheep And Goat Plague**
129. Themes of Genetic resources _____ **2**
130. Phenylketonuria caused by _____ **Mutation**
131. Reason for crustaceans migration_____ **For Breeding**
132. cause behind extinction of steller's Sea Cow_____**Hunting**
133. Cryopreservation can be done _____ **-196c**
134. Darwin finchis is example of _____ **Adaptive Radiation**
135. Wild beest are the part of _____ **Great Migration**
136. In 19th century only elephant seales were present_____ **20**

[redacted] | : ARHAM (+923351328979) | : AIZA WRITES

137. Gene pool types_____ **3**
138. According to FAO ,there are approximately _____**31000 Species Of Finfish.**
139. Antibiotics Stop or inhibit the Growth of microorganism **By Stopping Their Metabolic Activity**
140. Genetic resources are sometimes called------ **First Resources.**
141. Landraces Is a ---------- **Local Variety Of Domesticated Plants.**
142. Which is called rosewood ----------**Dalbergia Sissoo.**
143. Total area under lequme crop In Pakistan----------**1.5m Hectares**
144. Which one Is extinct features of species----------**White Rhino**
145. Total remaining snow leopard in Pakistan----------**200**
146. Rhino are hunted for ----------**Horns**
147. According to world database on protected area there are over _____**Protected Areas Around The World. 210,000**
148. Microorganisms produces in_____ **Antibodies.**
149. GSPC program founded In _____**1999.**

SUBJECTIVEs

1. Why Should We Protect Endangered Species?

The Endangered Species Act is very important because it saves our native fish, plants, and other wildlife from going extinct. Once gone, they're gone forever, and there's no going back.

2. Note on Steller's Sea Cow and Dodo?

Steller' S Sea Cow

The largest mammals, other than whales, to have existed in the holocene epoch, the Steller's sea cow reached up to nine metres in length but was hunted to extinction in 1768, within 27 years of its discovery by Europeans.

Dodo

Perhaps the most famous extinct species, the dodo - endemic to Mauritius - was wiped out in just a few decades. The first recorded mention of the flightless bird was by Dutch sailors in 1598; the last sighting of one in 1662. It owes much of its fame to its appearance in Alice's Adventures in Wonderland.

3. Cause of Genetic Drift?

Genetic drift can be caused by a number of chance phenomena, such as differential number of offspring left by different members of a population so that certain genes increase or decrease in number

over generations independent of selection, sudden immigration or emigration of individuals in a population changing gene

4. Retinitis Pigmentosa And Its Prevalence?

Retinitis Pigmentosa

A group of genetic disorders which affect the cells in the retina, retinitis pigmentosa often results in difficulty seeing at night as well as other forms of partial blindness. Eventually, most sufferers lose nearly all their sight, often presenting as a severe form of tunnel vision. Retinitis pigmentosa affects as many as 1 in 4,000 people. However, one small subset of people has a much higher rate of occurrence: Ashkenazi Jews.

5. Features of Domestic Sheep?

The sheep is usually stockier than its relative the goat (genus Capra); its horns, when present, are more divergent; it has scent glands in its face and hind feet; and the males lack the beards of goats. Sheep usually have short tails.

6. Reproductive Isolation?

The mechanisms of reproductive isolation are a collection of evolutionary mechanisms, behaviors and physiological processes critical for speciation. They prevent members of different species from producing offspring, or ensure that any offspring are sterile. These barriers maintain the integrity of a species by reducing gene flow between related species

Types of Reproductive Isolation

- Pre-zygotic isolation
- Post-zygotic isolation

Examples of Sympatric Speciation: In Apple Maggot Flies

7. Difference B/W Allopatric Speciation And Sympatric Speciation?

Allopatric Speciation is a Speciation that results when a population is separated by a physical barrier. It is also referred to as geographic speciation

Sympatric Speciation is speciation that occurs without physical separation of members of the population.

8. What Are Breeding Lines?

These are lines populations developed in breeding programs have COLLECTIONS narrow genetic base and often contain valuable gene combination.

This group nearly contain homozygous line or mutant lines and lines derived from biology programs, including transgenic lines. They are ordinarily maintained as working collection by breeders.

9. How Microorganisms Are Beneficial To Ecosystems?

Microorganisms are found everywhere in the environment and play a leading role in countless natural processes. Among other things, they operate the basic drug cycles that are necessary for the plants' supply of nutrients via the reaction of organic matter in soil.

10. What Is The Major Objective Of Cryopreservation? 2marks

Cryo is Greek word. (krayos – frost). It literally means preservation in "frozen state." It is a process where tissues, organelles, cells, extracellular matrix, organs or any other biological constructs susceptible to damage caused by unregulated chemical kinetics are preserved by cooling to very low temperature.

11. Why Species Threatened in Pakistan?

The reasons for extinction are anthropogenic activities and climate changes. Climate change is also induced by human activities. Anthropogenic activities like habitat fragmentation, hunting, killing, poaching, and illegal and nature destructive activities threaten the existence of animals

12. Finding Way Migration?

Scientists aren't really sure exactly how some animals figure out how to get to where they are going. They think that:

- Some animals use landmarks like rivers and streams to find their way.
- Some animals may navigate by the position of the sun and stars.
- Some animals use smell to figure out where they are going.
- Some species that may use the Earth's magnetic field to navigate.

EXAMPLES:

- The Atlantic Salmon begins its life in a river and migrates downstream to the ocean. After several years, it heads back upstream to lay eggs and begin the cycle all over again.
- Some crustaceans also migrate for breeding. In many species of crabs, the females will move into shallow coastal waters to mate and lay her eggs and then they return to deeper ocean waters.
- Frogs and toads often move very short distances to breeding ponds and lakes to lay their eggs.
- Some sea turtles, like the loggerhead, return year-after-year to the same sandy beach on which they hatched to lay their eggs.
- Sometimes animals migrate to find a place to hibernate.

- Little brown bats live in trees in warm months, then in cold weather they migrate to caves where it is warmer.

13.Explain Cryopreservation Techniques?

Cryopreservation Technique:

- **Slow freezing and thawing**
- **Rapid freezing and thawing**
- **Vitrification**
- **Ultrarapid freezing**

Slow Freezing- Slow thawing

With this method organs are labeled into vials after equilibration with a cryoprotectant solution and then cooled at rate of 0.5-2 °C per minute down to -1 °C. Seeding is then induced and a holding period of 5 to 15 minutes allows equilibration of the temperature. Thereafter embryos are cooled to -60 °C or lower at a rate of 0.3 to 0.5°C per minute before being transfer to liquid nitrogen. Frozen embryos must be slowly thawed at a rate of less then 25°C per minute to prevent osmotic shock.

Rapid cooling and rapid thawing

In this technique , however cooling is terminated at -30 to -40 °C and embryos are then plunged into liquid nitrogen for rapid cooling to -196°C. Thawing is therefore

performed rapidly (200 to 500°C per minute) to prevent recrystallization

Vitrification

Vitrification is the process of cooling where the water in the tissue becomes glass rather than crystals. Glass is a liquid that is too cold (too viscous) to flow. In other words vitrification is solidification due to increased viscosity rather than crystallization.

Ultrarapid Freezing

In this technique serial equilibration of embryos in high concentration of DMSO (3-5 M) supplemented with sucrose (0.3 to 0.5 M). The embryos are then plunged into liquid Nitrogen. Thawing is then done with warm water bath (approximately 500°C per minute).

14.Why Is The Pitcher's Thistle Threatened?

- Shoreline Development –
- Road Maintenance and Construction

- Shoreline Recreation Activities

15. Write Note on The Indus Dolphin?

- The Indus River dolphin is one of the world's rarest mammals
- It is second most endangered freshwater river dolphin
- Approximately 1,100 specimens of this species exist today in a small fraction of their former range
- Population of this species has gradually declined due to various factors e.g. water pollution, poaching, fragmentation of habitat due to barrages and dolphin stranding in the irrigation canals.

16. Difference Between Genetic Drift and Gene Flow?

- **Gene flow** occurs via mixing of genes with other populations while **Genetic Drift** takes place when the allele frequency is changed between two generations of a population**.**
- **Genetic drift** takes place between two generations **whereas Gene Flow** takes place between two populations
- **Genetic Drift** occurs in only one species whil**e Gene Flow c**ould take place between either two populations or two species.

17. Algal Blooms?

Algae Bloom is a rapid increase or accumulation in the population of algae in freshwater or marine water systems.

18. Heterosis?

Heterosis or hybrid vigor is the superiority of the crossbreed offspring. Mathematically, heterosis is the difference in performance between the crossbred and the average performance of its purebreed parents.

19. Difference between Wild form and Wild Relative Crops?

- **Wild forms** are wild species from which crop species are directly derived. They are easy to cross with the concerned crop species.
- **The wild relatives** include all other species. Which are related to the crop species by descent during their evolution.

20. Different method of cryopreservation? Types of cryopreservation?

There are various methods of storage :

a) **Cryopreservation** - generally involves storage in liquid nitrogen.
b) **Cold storage** - it involves storage in low and non freezing temperature.

c) **Low pressure** – it involves partially reducing the atmospheric pressure of surrounding.

d) **Low oxygen storage** - it involves reducing the oxygen level but maintaining the pressure.

21.Local migration?

Local migration occurs because of heavy rain, flood, excessive cold &hot. Return to that area when crisis is over. Flowering of certain plants and ripening of fruits also cause local migration.

22.What is genetic material?

Genetic materials that are typically cryogenically preserved include sperm, oocytes, embryos and somatic cells

23.National animal of Pakistan?

The markhor is the national animal of Pakistan.

24.Difference between policy and strategies?

- **Policy** is a set of common rules and regulations, which forms as a base to take day to day decisions .
- **Strategy** is a plan of action while the policy is a principle of action .

25.Advantage and Disadvantage of out breeding?

- **Advantages of Out breeding:**

- Out breeding often produces offspring of superior quality because it increases homozygosity (the occurrence of two alleles for the same trait at corresponding positions on homologous chromosomes)
- Sharply reduce the risk of deleterious recessive genes being expressed
- One of the benefits of out breeding is less chance of genetic abnormalities
- The ability to make a breed stronger

- **Disadvantages of Out breeding:** outbreeding species. 3 Can destroy well-adapted genotypes because the offspring (genotypes) from sexual reproduction are not guaranteed to be viable, as is the case with selfing.

26.How extinct is affected medical?

Many different species have unique bodily processes that can cure human diseases. e.g. the toxins produced by dartpoison frogs in the rain forest have yielded information about how alkaloid compounds behave in living organisms. Scientists also study bears for clues about how they recycle blood toxins

during hibernation to find potential solutions to kidney disorders. Plants from forests are useful for medicinal purposes.

27. What Antibiotics?

"Antibiotic is chemical substance produced by microorganisms that can kill or inhibit the growth of other microorganisms".

28. Strategy of plant conservation?

The Global Strategy for Plant Conservation (GSPC) is a program of the UN's Convention on Biological Diversity founded in 1999. It is a Plan to Save the World's Plant Species - grew out of the Convention on Biological Diversity and is being fed into government policy around the world.

29. Factor of genetic diversity?

a. Mutations
b. Speciation
c. Errors in Meiosis

30. What Allopatric speciation?

Gene flow blocked by physical barriers results in Allopatric speciation

31. National strategy for PGRFA?

A National Strategy for PGRFA is the blueprint for the management of a country's PGRFA as a continuum of interventions in order to achieve clearly defined time bound goals.

32. Gene Environment interaction?

Gene–environment interaction (or genotype–environment interaction or G×E) is when two different genotypes respond to

environmental variation in different ways. There are two different conceptions of gene– environment interaction. • biometric and developmental interaction

33. Cause of migration?

Cases of Migration

- Shortage of food supply on the breeding ground
- Environmental factors
- Internal factors

- Photoperiodism
- Fat deposition

34. Gene Bank?

Gene bank refers to a place or organization where germplasm can be conserved in living state.Gene banks are also known as germplasm banks.

35. Cause of extent?

There are **five major causes of extinction:** habitat loss, an introduced species, pollution, population growth, and overconsumption. Through the activity, students will create a list of reasons why animals can become **extinct.**

36. Gene flow and gene drift?

- **Gene Flow:** "The introduction of genetic material (by interbreeding) from one population of a species to **another"**
- **Genetic Drift:** "Random changes in gene frequency especially in small populations when leading to preservation or extinction of particular genes"

OR

- **Genetic drift** is the phenomenon of change in the frequency of alleles (variants of a gene) in a population of organisms due to chance or random events

37. Richness of microorganism and total no?

- Numbers of species described and currently accepted in most groups of microorganisms worldwide are respectively 143,000 & 18,500
- 120 new species of bacteria and 1,500 new species of fungi are added to science each yea
- This clearly demonstrating that knowledge of these groups is grossly inadequate .

38. Genetics resources for food and agriculture?

Genetic resources for food and agriculture are the raw materials upon which the world relies to improve the productivity and quality of domesticated plant and animal populations, as well as to maintain healthy populations of wild species, including those used in forestry and fisheries.

39. How extinct species cause destruction of ecosystem?

Species of animals cannot live away from each other. They work together to form an ecosystem. Extinction of one species can effect other by effecting food chain .They depend upon each other and their environment to survive. So in this way it can destroy whole ecosystem

40.Discuss global strategy for plant conservation?

The Global Strategy for Plant Conservation (GSPC) is a program of the UN's Convention on Biological Diversity founded in 1999. It is a Plan to Save the World's Plant Species - grew out of the Convention on Biological Diversity and is being fed into government policy around the world.

The GSPC highlights the importance of plants and the ecosystem services they provide for all life on earth, and aims to ensure their conservation.

The GSPC has 5 main objectives:

1) Plant diversity is well understood, documented and recognized
2) Plant diversity is urgently and effectively conserved
3) Plant diversity is used in a sustainable and equitable manner
4) Plant diversity is used in a sustainable and equitable manner
5) The capacities and public engagement necessary to implement the strategy have been developed.

41.Step of Conserve the plant genetics resource?

Plant genetic diversity is vulnerable to “genetic erosion”, the loss of individual alleles/genes and of combinations of alleles/genes, such as those found in locally adapted landraces. ... PGR, the only source of plant genetic diversity, provides valuable traits needed for meeting the challenges of adapting crop varieties.

42.Method of horizontal gene transfer in bacteria?

- **Vertical Gene transfer**: “The transfer of genes from parents to offspring.”
- **Horizontal gene transfer**: horizontal gene transmission among bacteria, especially from a donor bacterial species to different recipient species, is conjugation.

43.Threat Angr?

- Despite the importance of animal genetic resources and their diversity, their diversity has been continually decreasing over time.
- One of the greatest threats to livestock diversity is pressure from large-scale commercial production systems to maintain only high-output breeds.
- Changes in climate will have an impact on livestock and food production in many ways.

- Some major disease threats that livestock currently face include, rinderpest, foot and mouth disease, and Peste des petits ruminants (PPR), also known as sheep and goat plague.

44. Inbreeding Types?

a. Close inbreeding
b. Mild inbreeding
c. Line inbreeding

45. Freezing Method?

Freezing. Freezing in food processing, method of preserving food by lowering the temperature to inhibit microorganism growth. The **method** has been used for centuries in cold regions, and a patent was issued in Britain as early as 1842 for freezing food by immersion in an ice and salt brine.

46. Characteristics Of Gene Pool. 3

- It includes all the variants or alleles of every gene.
- It includes all the genes present in the population
- In most cases, the population includes individuals of the same species.
- A gene pool includes even those genes whose effects are not visible in an individual.

47. Threats To Angr 5

Despite the importance of animal genetic resources and their diversity, their diversity has been continually decreasing over time.

One of the greatest threats to livestock diversity is pressure from large-scale commercial production systems to maintain only high-output breeds.

Changes in climate will have an impact on livestock and food production in many ways. Some major disease threats that livestock currently face include, rinderpest, foot and mouth disease, and Peste des petits ruminants (PPR), also known as sheep and goat plague.

48. Type Of Wild Plant 2

Some of the common wild plant genetic resources are as follow;

- Prickly Acacia/Keekar
- Coral Tree
- Deodar Cedar
- Dalbergia Sissoo /Sheesham Tree
- Calotropis procera/Giant milkweed
- Alovera

- Marijuana.

49.When Founder Effect Occurs?2

In population genetics, the founder effect is the loss of genetic variation that occurs when a new population is established by a very small number of individuals from a larger population.

50.Type Of Genetic Stocks(3)

Genetic stocks,broadly defined as plants or populations generated and/or selected for genetic studies, represent a unique and growing class of extremely valuable germplasm which, depending on crop, type of genetic stock and user community may represent genetic resources of either transient or long-lasting value **Genetic stocks:**

Genetic stocks can be divided into three general groups

- Cytological Stocks
- Mutants Stock
- Germplasm set

51.Reason For Grading Up(3)

Grading up Breeding of animals of two different breeds where the animals of an indigenous breed/genetic group is mated by an improved pure breed for several generations towards attaining the superior traits of the improved breed

Grading up is continuous use of purebred sires of the same breed in a grade herd. By fifth generation, the graded animals may reach almost purebred levels.

52.How Animals Figire Out That Where They Arw Going (5)

Scientists aren't really sure exactly how some animals figure out how to get to where they are going. They think that:

- Some animals use landmarks like rivers and streams to find their way.
- Some animals may navigate by the position of the sun and stars.
- Some animals use smell to figure out where they are going.
- Some species that may use the Earth's magnetic field to navigate.

53.What Is Outbreeding

Out-breeding:

Out-breeding is the mating of animals of the same breed but which have no closer relationship than at least 4 to 6 generations. Out breeding is the recommended breeding practice for most purebred sheep breeders. .

54. Why Do We Need To Conserve Plant Genetic Resources ?

- Conservation of plant genetic resources is necessary for food security and agrobiodiversity
- Biodiversity provides a valuable source of compounds to the medical, food and crop protection industries
- Maintenance of ecosystem Genetic resources need to be conserved so that they may be used in crop research and be used as sources of genes for crop improvement.

55. Effect Of Bottleneck Effect On Alleles Frequency ?

- Allele frequencies in a group may be very different from those of the population prior to the event,.
- Even some alleles may be missing entirely.
- The smaller population will also be more susceptible to the effects of genetic drift for generations (until its numbers return to normal).
- Effect potentially causing even more alleles to be lost. In human evolution
  It is theorized, based on genetic evidence, that a few tens of thousands of years ago the population of Homo sapiens was reduced for a period to a few thousand or tens of thousands of people. Such abottleneck would explain the extremely low level of genetic diversity found within our species, when contrasted with others, such as Chimps.

- **Cheetah** All Cheetah shared a small number of alleles. Less then 1% diversity As if all cheetahs are identical twins
- **Bottleneck effect**
  10,000 years ago Ice age Last 100 years Poaching and loss of habitat

56. Types Of Ex Situ Conservation ?

- **Gene Bank**

  Gene bank refers to a place or organization where germplasm can be conserved in living state. Gene banks are also known as germplasm banks.

- **Seed Gene Bank**

  A place where germplasm is conserved in the form of seeds is called seed gene bank. Seeds are very convenient for storage because they occupy smaller space than whole plants.

- **Field Gene Bank**

  Field gene banks also called plant gene banks are areas of land in which germplasm collections of growing plants are assembled.

- **Botanical Garden**

A botanical garden or botanic garden is a garden dedicated to the collection, cultivation and display of a wide range of plants labeled with their botanical names

57. What Is Threathend Of Species 3

Threatened species are any species (including animals, plants, fungi, etc.) which are vulnerable to endangerment in the near future. Species that are threatened are sometimes characterized by the population dynamics measure of critical dispensation, a mathematical measure of biomass related to population growth rate.

58. What Is Demosticated Plant 2

Some domesticated plant resources in Pakistan are as follow; • Fruit Trees

- Citrus Fruits
- Nut Trees

Legumes

- Cereals
- Vegetables
- Herbs and Shurbs etc

59. Difference Between Close Breeding And Linear Breeding

❖ **Close Inbreeding:**

Animals are very closely related and can be traced back to more than one common ancestor. Closest form of inbreeding in domestic animals involves mating between full brothers and sisters (full siblings) Second closest form of inbreeding involves mating between grand-parents and grand-offspring, half brothers and sisters (half siblings)

❖ **Line Breeding**

Mating animals that are more distantly related which can be traced back to one common ancestor.e.g. Cousins Grandparents to grand offspring, Half-brother to halfsister. Line breeding increases genetic purity amongst the animals of progeny generations. **69. What is mild breeding?**

Mild Inbreeding ::: Mating of relatives beyond 2nd generation and upto 6th generation

60. What Is Demosticated Plant?

"Plant domestication is the process whereby wild plants have been evolved into crop plants through artificial selection."

61. When Bubal Hartebeest Are Extinct ?(2)

The animals were hunted to extinction and the last known Bubal hartebeest was killed in Algeria sometime between 1945 and 1954, according to the International Union for Conservation of Nature.

62. What Are The Reason Of Migration To Be Tiggered? (3)

The trigger for the migration may be: ❖ **Local Climate**

- **Local Availability Of Food**
- **The season of the year**
- **For mating reasons**

63. Give One Example Of Gene Environment Interaction In Plant (5)

In Drosophila

Mean bristle number on Drosophila could vary with changing temperatures.

In plants

Seven genetically distinct yarrow plants were collected and three cuttings taken from each plant. One cutting of each genotype was planted at low, medium, and high elevations, respectively. When the plants matured, no one genotype grew best at all altitudes, and at each altitude the seven genotypes fared differently. For example, one genotype grew the tallest at the medium elevation but attained only middling height at the other two elevations. The best growers at low and high elevation grew poorly at medium elevation. The medium altitude produced the worst overall results, but still yielded one tall and two medium-tall samples. Altitude had an effect on each genotype, but not to the same degree nor in the same way

Phenylketonuria (PKU)

It is a human genetic condition caused by mutations to a gene coding for a particular liver enzyme. In the absence of this enzyme, an amino acid known as phenylalanine does not get converted into the next amino acid in a biochemical pathway, and therefore too much phenylalanine passes into the blood and other tissues. Change in environment (lowering Phenylalanine consumption) can affect the phenotype of a particular trait, demonstrating a gene-environment interaction.

64. Gene Sanctuary?

A gene sanctuary is an area where plants are conserved. It includes both biosphere reserves as well as national parks. India has set up its first gene sanctuary in the Garo Hills of Meghalaya for wild relatives of citrus. Efforts are also being made to set up gene sanctuaries for banana, sugarcane, rice and mango

65. Hungton Disorder?

Huntington's disease (aka Huntington's chorea) is a genetic disorder which results in slowly progressing brain cell death. there are two distinct populations in which the disorder occurs much more often.

1) The first group is the Afrikaner population of South Africa.
2) The second group is the residents of the Lake Maracaibo region of Venezuela.

66.Sympatric Speciation?

Sympatric speciation is speciation that occurs when two groups of the same species live in the same geographic location, but they evolve differently until they can no longer interbreed and are considered different species. This is often result of Reproductive isolation

67.One Example Gene Interaction In Plants?

Seven genetically distinct yarrow plants were collected and three cuttings taken from each plant. One cutting of each genotype was planted at low, medium, and high elevations, respectively. When the plants matured, no one genotype grew best at all altitudes, and at each altitude the seven genotypes fared differently. For example, one genotype grew the tallest at the medium elevation but attained only middling height at the other two elevations. The best growers at low and high elevation grew poorly at medium elevation. The medium altitude produced the worst overall results, but still yielded one tall and two medium-tall samples. Altitude had an effect on each genotype, but not to the same degree nor in the same way.

68.Difference B/W Outbreed And Inbreed?

Outbreeding

"The intentional breeding of distantly related or unrelated individuals for the purpose of producing offspring of superior quality."

There are three types of out breeding

- **Cross breeding**
- **Grading up**
- **Species cross Inbreeding**

"Inbreeding, the mating of individuals or organisms that are closely related through common ancestry."

Inbreeding is useful in the retention of desirable characteristics or the elimination of undesirable one's. It also results in decreased vigour, size, and fertility of the offspring due to combined effect of harmful genes that were recessive in both parents There are 3 types of Inbreeding;

- **Close inbreeding**
- **Mild inbreeding**

- **Line inbreeding**

69. Genetic Resources Of Micro-Organisms?

Genetic resources of micro-organisms means genetic material of actual or potential value from micro-organisms. **Invertebrates Genetic Resources**

Invertebrates include a great number of species that perform valuable functions in agro-ecosystems.

70. When West African Black Rhinoscances Were Be Extinct?

West African Black Rhinoceros :

The West African black rhinoceros (Diceros bicornis longipes) was a subspecies of the black rhino that was declared extinct in 2011.

71. What Is 6 Artical Of Agriculture Genetic Resources?

Article 6: Sustainable Use of Plant Genetic Resources:

The Contracting parties shall develop and maintain appropriate policy and legal measures that promote the sustainable use of plant genetic resources for food and agriculture.

72. What Is Cryopreservation?

Cryopreservation:

Cryo is Greek word. **(krayos – frost).** It literally means preservation in "frozen state."

It is a process where tissues, organelles, cells, extracellular matrix, organs or any other biological constructs susceptible to damage caused by unregulated chemical kinetics are preserved by cooling to very low temp (typically-80degree Celsius using solid carbon dioxide or -196 degree Celsius using liquid nitrogen

73. How May Ways Bacteria Have Transfer Their DNA Horizontally?

"Horizontal gene transfer is known to occur between different species, such as between prokaryotes and eukaryotes, between the three DNAcontaining organelles of eukaryotes, the nucleus, the mitochondrion and the chloroplast."

Horizontal gene transfer is basically the transfer of genes between organisms via methods other than asexual or sexual reproduction.

Genes and the characteristics code for are passed down from parent to progeny.

There are three ways for bacteria to transfer their DNA horizontally

- **Conjugation**
  The transfer of DNA directly from one cell to another through cell-cell contact often involving plasmids

- **Transformation**
  Bacteria are capable of taking up DNA directly from their environment and incorporating it into their genomes

  known as natural transformation

- **Transduction**
  Transduction is the transfer of DNA from one cell to another by a virus.

74.Migration With Example?

Migration "Migration is the relatively long-distance movement of individuals, usually on a seasonal basis." e.g. Some crustaceans migrate for breeding

75.Founder Effect With Example?

Founder Effect : In population genetics, the founder effect is the loss of genetic variation that occurs when a newpopulation is established by a very small number of individuals from a larger population. The Amish People Around 200 German immigrants settled in Pennsylvania Within community marriages Developed syndrome named Ellisvan Creveld syndrome **Common symptoms are;**

- Haemophilia
- Dwarfism (1/14 carry the gene)
- Still births/infant deaths
- Physical deformities

76.Quarantine Regulations

Plant quarantine regulations are promulgated by the national and the state governments to prevent the introduction and spread of harmful pests and pathogens. Plant quarantine will be justified only when the pest has no natural means of spread and when they are based on biological considerations only, i.e., pest/pathogen introduction risks and the available safeguards.

In general, risks are more with the introduction of vegetative propagules than with true seed. In case of true seed, risks are more with deep-seated infections than with the surface borne contamination of pests/pathogens. Again, risks are far greater with pathogens like viruses, downy mildews, smuts and many bacteria carried inside the seed without any external symptoms. When vegetative

propagules are introduced, rooted plants, and other underground plant parts like rhizomes, suckers, runners, etc. carry higher risks than budwood, scions and unrooted cuttings. In any case, bulk introductions

are always risky as thorough examination and treatment in such cases is very difficult and planting area is far too large to prevent the establishment and spread of the introduced pest/disease.

77. What Is Genetic Resources?

Genetic resources are sometimes called the "first resource" of the natural resources on this planet - the others being land, air, and water. The diversity of genetic resources for food and agriculture (i.e. plants/crops, animals, aquatic resources, forests, microorganisms and invertebrates) plays a crucial role in meeting basic human food and nutritional needs

78. What Is Gene Pool?

The combination of all the genes present in a given population is called the gene pool of that population."

- It includes all the variants or alleles of every gene.
- It includes all the genes present in the population.
- In most cases, the population includes individuals of the same species.
- A gene pool includes even those genes whose effects are not visible in an individual.
- A number of animal species, such as mountain lions in the Americas, and leopards in South Africa, are threatened by human activities.
- Their habitat has been divided into fragments, surrounded by towns and farmlands.
- This results in interbreeding among smaller populations, • The small gene pool makes them susceptible to diseases.

79. What Is Importance Of Domestic Animal Resources?

"Animals that are not wild and is kept as a pet or to produce food"

For example; Dog , Buffalo , Goat , Sheep , Cattle , Cat **Importance of Domestic Animal Resources:** Domesticated animal resources are important as follow;

- Animals provide milk
- Hair from goat and sheep is used for making woolen clothing, shawls and blankets
- Some drugs are especially obtained from animals. **Ex.** Heparin an anticoagulant is used to control clots in blood, is obtained from ox lungs and pig intestines
- Animal's meat is the part our of diet
- Animals are a great source of leather which is used for making foot wear, belts, wallets bags, furniture.

80. Ecosystem Is Facing Massive Destruction Extinction Species. How?

There are following major causes of extinction;

- Climate change
- Habitat destruction
- lack of genetic diversity
- Better-adaptive condition
- Pollution
- Human over-population
- Poaching and hunting

Climate Change

Almost half of plant and animal species have experienced local extinctions due to climate change. Global warming could trigger not just local but global extinctions of animals and plants Species already threatened by habitat destruction, pollution, alien invasion and overhunting are more vulnerable to climate change.

Diversity of species in any one ecosystem could be affected by rises in average temperatures or a shift of climate regime

81.Inbreeding ? (2 Marks)

"Inbreeding, the mating of individuals or organisms that are closely related through common ancestry."

Inbreeding is useful in the retention of desirable characteristics or the elimination of undesirable one's. It also results in decreased vigour, size, and fertility of the offspring due to combined effect of harmful genes that were recessive in both parents.

82.Endangered Species With Example (2)

"A species of plant or animal that is in immediate danger of becoming extinct and needs protection to survive."

Endangered species are like fire alarms. They tell us about problems in our home we call Earth. Endangered species must be protected for better health of earth and ecosystem balancing.

Some most endangered species in Pakistan are as follow;

a. The Indus River dolphin
b. Markhor
c. Asian Black Bear
d. Snow Leopard

83.Method Of Storage ? 3 Marks

The maintenance of the frozen cells or material at specific temperature is very important. In general the temperature is kept -70 to -196 degree.

Prolong storage is done at temperature of -196 degree in liquid nitrogen. To prevent damage, continuous supply of nitrogen is done.

84.Breeding In Details And It's Type ?

A breed is a group of domestic animals with a homogeneous appearance, behavior, and other characteristics that distinguish it from other animals.

- Pure-breeding
- Inbreeding
- Out-breeding
- Line breeding
- Crossbreeding

1) **Pure-breeding:**

Pure-breeding is the mating of males and females of the same breed or type. purebred flock can be managed as a single flock because all animals are of the same breed. The goal of purebred sheep production is to provide superior genetics (seed stock) to the commercial sheep industry.

2) **Inbreeding:**

Inbreeding is a system of breeding in which closely related animals are mated. Technically, inbreeding is defined as the mating of animals more closely related than the average relationship within the breed or population concerned. The primary genetic consequence of inbreeding is to increase the frequency of pairing of similar genes.

3) **Out-breeding:**

Out-breeding is the mating of animals of the same breed but which have no closer relationship than at least 4 to 6 generations. Out breeding is the recommended breeding practice for most purebred sheep breeders.

4) **Crossbreeding:**

Crossbreeding is the mating of animals of different breed compositions or types. However, it does not denote indiscriminate mixing of breeds, but rather is a systematic utilization of different breed resources to produce crossbred progeny of a specific type. Crossbreeding is used extensively in the commercial sheep industry and the majority of slaughter lambs are crossbred.

85.Nagoya Protocol?

Nagoya Protocol

The Nagoya Protocol focuses on the equitable sharing of genetic material (plant, animal, microbial, other) including the traditional knowledge associated with the genetic resources, and the benefits that arise from their use.

86.Bottleneck Effect?

Bottleneck Effect

"The bottleneck effect is a sharp lowering of a population's gene pool because of an environmental, or human- caused, change."

Founder Effect

"The effect on the resulting gene pool that occurs when a new isolated population is founded by a small number of individuals possessing limited genetic variation relative to the larger population from which they have migrated"

87.Names Of Nut Trees?

Nut Trees

Nut Trees in Pakistan are as follow;

- Almonds
- Walnut
- Tree Nuts

Almonds

- Almonds fall in the family of peaches, plums and nectarines.
- Seeds of these plants are edible as Almonds.
- Almond plants blossom into beautiful pink flowers in spring in addition to yielding fruits in summer

88.Disadvantage Of Inbreeding 3marks

a. An increase in the prevalence of inherited disorders
b. A decrease in viability A decrease in reproductive ability
c. The loss of genetic diversity (i.e. decrease in genetic variation).
d. Developmental disruption, higher infant mortality and a shorter life span
e. Reduction of immune system function

Uses Of Sheesham Tree? 3marks

Dalbergia Sissoo / Sheesham Tree

- Dalbergia Sissoo, also known as Indian Rosewood, is the source of Sheesham wood.
- The tree is native to India and Pakistan and grows all over the SubHimalayan Regions
- Its leaves are compound, and produces pink-white flowers that resemble a pea flower.

- It gives a dry fruit that is a thin and papery pale brown pod.
- The tree mainly offers timber

89.Types Of In Situ Conservation?

1) **National Park**
2) **Biosphere Reserve**
3) **Gene Sanctuary**

I. **National Park**

National park may be define as a area declared by state for the purpose of protecting, propagating wildlife there in or its natural environment for their scientific educational and recreational value

II. **Biosphere Reserve**

Biosphere reserves are areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use. They are internationally recognized, nominated by national governments and remain under sovereign jurisdiction of the states where they are located.

III. **Gene Sanctuary**

The genetic diversity is sometimes conserved under natural habitat. In other words, areas of great genetic diversity are protected from human interference. These protected areas in natural habitat are referred to as gene sanctuaries.

90.What Is Pure Breeding?

Pure-breeding is the mating of males and females of the same breed or type. purenbreed flock can be managed as a single flock because all animals are of the same breed. The goal of purebred sheep production is to provide superior genetics (seed stock) to the commercial sheep industry

91.Factors Involve In Specie Extinction?

Extinction occurs when species are diminished because of environmental forces such as habitat fragmentation, climate change, natural disaster, overexploitation by humans, and pollution, or because of evolutionary changes in their members (genetic inbreeding, poor reproduction, decline in population numbers).

92.De Merits Of Ex_Situ Conservation?

Demerits:

- Usually only a small number of individuals can be cared for.
- lt can be difficult and expensive to create and sustain the right environment.

- The animals that are habituated (used to) human contact may be less likely to exhibit natural behaviors and may be more likely to catch a disease from humans.
- This type of conservation is usually less successful as many species can't breed successfully in captivity or don't adapt to their new environment when moved to a new location.

93. What Is Migration?

"**Migration** is the relatively long-distance movement of individuals, usually on a seasonal basis."

For Example: Some crustaceans migrate for breeding.

94. Write Any Five Types Of Genetic Resources? 5

Types of Genetic Resources

a. **Plant Genetic Resources**
b. **Animal Genetic Resources**
c. **Forest Genetic Resources**
d. **Aquatic Genetic Resources**
e. **Genetic Resources of Microorganism**
f. **Invertebrates Genetic Resources**

Plant Genetic Resources for Food and Agriculture (PGRFA) are the raw material that farmers and plant breeders use to improve the quality and productivity of crops.

They can be defined as any genetic material of plant origin of actual or potential value for food and agriculture, e.g.seeds, tubers, mature plants etc.

1) **Animal genetic resources (AnGR)** is used to include all animal species, breeds and strains that are of economic, scientific and cultural interest to humankind in terms of food and agricultural production for the present or the future.
2) **Forest genetic resources (FGR)** are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.
3) **Aquatic genetic resources** also comprise all water-dwelling genetic resources.
4) **Genetic resources of micro-organisms** means genetic material of actual or potential value from micro-organisms.

95. Difference Between Genetic Drift And Natural Selection?

Genetic Drift	Natural Selection

Genetic Drift shows changes in the genome that may be advantageous, deleterious or may have no effect.	**Natural selection** shows the positive changes in the genome that may give its possessor an adaptive advantage
Genetic drift is completely random and is solely based on luck.	**Natural selection** is response to an organism's environmental challenges.
Genetic drift is largely influenced by the population size, whereas natural selection is not.	**Natural selection** will always result in the selection of allele that gives an advantage to its possessor, while genetic drift causes advantageous genes to be removed in the following generations.
Genetic drift leads to the reduction of genetic variations, or may sometimes be responsible for introducing genetic variation in a population.	Natural selection will always result in introducing more genetic variations Between in a population.

دانا کے پاس ایک دانہ نہیں اور جس کے
پاس دانے ہیں اس کے پاس دانائی نہیں۔

عائیزہ رائیٹس