BT201 – ECOLOGY, BIODIVERSITY & EVOLUTION-II

ALL OBJECTIVEs & SUBJECTIVEs FROM PAST FILES FOR MID TERM

| : ARHAM (+923351328979) | : AIZA WRITES

OBJECTIVEs

1. The laborious _____ technique has now been replaced mostly by sequencing using mass spectrometry. **Edman Degradation**
2. Most important measures ecologist uses to describe composition of community are _____ **Species Diversity & Species Richness**
3. _____ is used to predict the protein structures. **Mass Spectrometry**
4. Vertebrates are _____ **5%**
5. _____ drug used to treat malaria. **Quinine**
6. Malaria is caused by the genus Plasmodium technically a member of the phylum _____ **Sporozoa**
7. Lyme disease caused by ____**Tick**
8. Larva of annelids trochophore similar to the _____ **Molluscs**
9. Gut tissue forms an organ ___ **Trophosome**
10. Krill: Component of plankton, Major food for _____ **Whales**
11. Muscular pharynx of annelids is called _____ **Eversible Proboscis**
12. Segmentation confined to small rear portion of animal called ____**Opisthosoma**
13. Trophosome play a role in ----------. **Nutrition**
14. _____ is a small ball above tube foot. **Ampullae**
15. Vertebtraltaerse evolved from _____ 540 million years ago. **Chordates**
16. Chordates are bilaterian animals that belong to the clade of animals known as_____ **Deuterostomia**
17. The study of these traditional reptile orders is called _____ **Herpetology.**
18. Turtles and tortoises belong to the order _____ **Chelonia**
19. Birds are _____. **Homoeothermic**
20. Zoologists that study birds known as ____ **Ornithologist**
21. One of following is not maintaining balance of the ecosystem---**Protecting Food Crop**
22. Gymnosperms are _____ **Naked Seeds**
23. Medicines from nature account for usage by ____ of the world's population. **80%**
24. Coral reefs which are biodiversity hotspots will disappear in _____ years. **20-40**
25. Habitat destruction is a major cause for _____**Biodiversity**
26. Plants found in a particular area, _____ **Flora**
27. Genetic modification of plants is achieved by adding a specific gene or genes to a plant, or by knocking down a gene with _____ **Rnai,**
28. Modern bread wheat is a mixture of recombined genes from ___ different wild species.**3**
29. The following are the major activities of plant breeding, correct sequence ____ **Collection Of Variation, Selection, Evolution, Release**
30. Gregor Mendel's experiments with plant hybridization led to his establishing _____ **Laws Of Inheritance**
31. One of the following is not the consequences of deforestation _____**Decrease In The Level Of Carbon Dioxide In The Atmosphere**

32. If for genetic modification genes of the species or of a crossable plant are used under control of their native promoter, then they are called _____ plants. **Cisgenic**
33. A philosophical concept of the value of something independent of its value to anyone or anything else called _____ **Intrinsic Value**
34. Coral reef is disappeared due to _____**Global Warming**
35. 80% of human food supply comes from _____ kinds of plants. **20**
36. Biodiversity is the result of 3.5 billion years of _____**Evolution**
37. Application of biotechnology or molecular biology is also known as ____**Molecular Breeding**
38. Edward Wilson described by the _____**Acronym**
39. _____ of all species on earth will be extinct by 2050. **30%**
40. _____ ecosystems are nowadays the most threatened ecosystems. **Fresh Water**
41. Over_____ of global fisheries are being overfished at unsustainable levels. **25%**
42. Humans use _____ species for food, clothing and shelter. **40,000**
43. _____ of all mammals will be extinct within 20 years. **25%**
44. Ayubia National Park is the first _____ in Pakistan. **Reserve Forest**
45. _____ is the number of alleles in a sample. **Allelic Richness**
46. Effective population size (Ne) is much smaller than ___ population size. **Census**
47. Seeds can be maintained in seed bank at _____ **20 ^{0}c**
48. CITES the Convention in International Trade in Endangered Species set up in__ **1988**
49. Plasmids Size: _____ **2-200 Bp**
50. Haldane (1929) gave the_____. **"Hot, Dilute Soup" Theory.**
51. Conjugation, transformation and transduction are ____ gene transfer. **Horizontal**
52. Oparian 1924 gave the _____ **Primeval Soup Theory**
53. RNA shows enzymic (catalytic) properties _____ called. **Ribozymes**
54. The sum of the variation of an interbreeding population is called ___**Gene Pool**
55. Analogy is similarity due to _____ evolution. **Convergent**
56. A ____ is a group of species that includes an ancestral species and all its descendants. **Clade**
57. _____ groups organisms by common descent**. Cladistics**
58. _____ years ago free oxygen was in atmosphere. **2 Billion Years**
59. Analogies are also known as ____**Homoplasies ("To Mold The Same Way")**
60. **Bad Or Lethal** mutations are often lost from a population over subsequent generations.
61. In the 18th century, Carolus Linnaeus published a system of taxonomy based on resemblances. Two key features of his system remain useful today_____ **TwoPart Names For Species And Hierarchical Classification.**
62. Kimber Ella is _____**Animal**
63. Human order Primates which consists _____ species. **180**
64. All known Proterozoic animals were _____ **Soft-Bodied**
65. _____ an animal from latest proterozoic rocks in Russia. **Kimberella**
66. Three types of homology_____ **ALL (Structural, Developmental, Genetic)**

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

67. Homologus structures _____ **Same Structure & Different Functions**
68. Humans differ from gorilla _____**Bipedal**
69. Humans are included in the order _____ **Primates**
70. _____ result from gene duplication, so are found in more than one copy in the genome. **Paralogous Genes**
71. A___grouping consists of various species that lack a common ancestor. **Polyphyletic**
72. ____ assumes that the tree that requires the fewest evolutionary events (appearances of shared derived characters) is the most likely.**Maximum Parsimony**
73. Which |s not related to endosymbiosis _____**Prokaryotic Cell Study**
74. _____ uses DNA and other molecular data to determine evolutionary relationships. **Molecular Systematics**
75. In genome evolution gene number and the complexity of an organism are_____**Not Strongly Linked**
76. Large scale areas of similar vegetation and climatic characteristics__ **Biome**
77. The field of biology specializing in storing and analysis data. **Bioinformatics**
78. The possibility of working with molecules on the scale of few micrometer is called. **Micro Ecology**
79. Which institute was not involved in human genome project? **U.S Center of Health**
80. .....factor effects the population growth. **Abiotic, Biotic (Both)**
81. The international human genome project initiated by **US National Institutes Of Health And The US Department Of Energy**
82. Three major technological developments of 1990s**. Microtechnology, Computing, Communication.**
83. There are some so called _____ to identify ecologically genes in incompletely genome.---------- **Pregenomic Molecular Approaches**
84. A first question that is asked when a species is considered for whole-genome sequencing is ____. **What Is The Size Of Its Genome?**
85. To assemble a genome from a series of sequences requires tremendous_____**Computational Power.**
86. The common extension of genomics is except_____ **Vaccinomics**
87. Comparative genomics is developing an increasing array of bioinformatics technique except ___**Synteny Shadow**
88. Types of selection which favor more than two extreme phenotype is _____**Disruptive Selection**
89. _____ is used to cleave protein. ---------- **Trypsin**
90. ____ is the study of all the transcripts that are present at any time in the cell. **Transcriptomics**

SUBJECTIVEs

1. Significance Of Whole Genome Sequencing. (5 Marks)

- Many bacteria and fungi are important as producers of valuable products,
- For example antibiotics, medicines,
- Vitamins, soy sauce, cheese, yoghurt, and other foods made from milk.

There is considerable interest in analyzing the genomes of these (pu¨hler and selbitschka 2003). Other bacteria are valuable genomic models because of their capacity to degrade environmental pollutants;

For example,

➢ The marine bacterium Alcanivorax borkumensis is a genomic model because it produces surfactants and is associated with the biodegradation of hydrocarbons in oil spills (ro¨ling et al. 2004).

Evolutionary Position

- Whole-genome analysis of organisms at crucial or disputed positions in the tree of life can be expected to contribute significantly to our knowledge of evolution.
- The sea squirt, ci. Intestinalis, was chosen as a model because it belongs to a group, the Urochordata, with properties similar to the ancestors of vertebrates.
- The study of this species should provide valuable information about the early evolution of the phylum to which we belong ourselves.
- Many other organisms, although not on the list for a genome project to date, have a strong case for being declared as model species for evolutionary arguments. These include the velvet worm, Peripatus, traditionally seen as a missing link between the arthropods and annelids, but now classified as a separate phylum in the panarthropoda lineage (nielsen 1995), and the springtail, folsomia candida, formerly regarded as a primitive insect, but now sug-gested to have developed the hexapod bodyplan before the insects separated from the crustaceans (nardi et al. 2003).

Comparative purposes

- Over the last few years, genomicists have realized that assigning functions to genes and recognizing promoter sequences in a model genome can greatly benefit from comparison with a set of carefully chosen reference organisms at defined phylogenetic distances.
- Comparative genomics is developing an increasing array of bioinformatics techniques, such as synteny analysis, phylogenetic footprinting and phylogenetic shadowing, by which it is possible to understand aspects of a model genome from other genomes.
- One of the main reasons for sequencing the chimpanzee's Genome was to illuminate the human genome, and a variety of fungi were sequenced to illuminate the genome of S. Cerevisae.

Ecological significance

- It will be clear that ecological arguments have only played a minor role in the selection of species for whole-genome sequencing, but we expect them to become more important in the future.

2. How Heterogeneity Help In Community Shaping?

If there is more variation, or heterogeneity, in a community's environment, this may allow for greater species richness because there are more distinct habitats to be occupied. For example, imagine a

community occupying a field, and another occupying a field that is dotted with piles of rock. The second community may have greater species richness because species that can live in the rocks (but not in the open field) will be present, in addition to those species that can live in the field.

3. What Is Intermediate Distribution Hypothesis. (2)

The intermediate disturbance hypothesis suggests that communities with a medium (intermediate) level of disturbance may have greater species diversity than communities with very frequent or very rare disturbances.

4. Define Community Structure? 2 Marks

Community structure is essentially the composition of a community, including the number of species in that community and their relative numbers. It can also be interpreted more broadly, to include all of the patterns of interaction between these different Species.

5. How Climate Affect Community?

Global climate patterns (variation in temperature, solar energy input, etc. With distance from the equator) can affect community structure. So can more local climate patterns, such effects created by mountain ranges, bodies of water, and even streams and valleys. The predictability or variability of climate can also affect community structure – for instance, some species may be unable to survive in a region with sporadic droughts or sporadic drops below freezing.

OR

Climate change could affect our society through impacts on a number of different social, cultural, and natural resources. For example, climate change could affect human health, infrastructure, and transportation systems, as well as energy, food, and water supplies. (Internet)

6. Difference Between Arctic And Polar Region?

The Arctic is not a continent which is the predominant different between the two polar regions. Under the massive ice cap of the Arctic lies the Arctic Ocean whose depths reach 15,000 feet below the surface. Often times the two polar regions are confused due to their having such similar names. (Internet)

7. Species Diversity? Species Richness?

Species richness is the number of different species in a particular community. Species diversity is a measure of community complexity.

8. Species Richness Systematics?

Species richness is the number of different species in a particular community. If we found 30 species in one community, and 300 species in another, the second community would have much higher species richness than the first.

9. Factor Forming Community Shape?

Shape the Forces That Bring A Community Together

- Common goals. Common goals (whether long-term or short-term) unite members to contribute towards it.
- Common threat. Common threats, problems and enemies help forge groups together.
- Isolation from others. Isolation from others focuses the attention upon each other. Barriers to entry. Barriers to entry are important. (Internet)

10. Explain Species Richness And Species Diversity With Example? 3 Marks

Species richness is the number of different species in a particular community. If we found 30 species in one community, and 300 species in another, the second community would have much higher species richness than the first. Communities with the highest species richness tend to be found in areas near the equator, which have lots of solar energy (supporting high primary productivity), warm temperatures, large amounts of rainfall, and little seasonal change. Communities with the lowest species richness lie near the poles, which get less solar energy and are colder, drier, and less amenable to life.

Species diversity is a measure of community complexity. It is a function of both the number of different species in the community (species richness) and their relative abundances (species evenness). Larger numbers of species and more even abundances of species lead to higher species diversity.

For example: A forest community with 20 different kinds of trees would have greater species diversity than a forest community with only 5 kinds of trees (assuming that the tree species were even in abundance in both cases)

11. Write At Least Five Factors That Shape Community Structure. (5 Marks)

The structure of a community is the result of many interacting factors, both abiotic (non-living) and biotic (living organism-related). Here are some important factors that influence community structure:

- The climate patterns of the community's location.
- The geography of the community's location.
- The heterogeneity (patchiness) of the environment • The frequency of disturbances, or disruptive events.
- Interactions between organisms.

12. Reproduction In Annelid

Sexes are usually separate with gonads occurring in each segment. Some species have gonad specific segments. Breeding is usually seasonal (spring or fall). As gametes mature, they fill the coelom and are released by the nephridia. Fertilization can be internal or external. Trochophore larvae develop, which are remarkably similar to the Molluscs

13. Fungus Like Protists

a. Classified by how they reproduce
b. Slime molds
c. Mold and mildew - disease causing

14. Phylum Echinodermata 5 Classes

- Class Crinoidea
- Class Concentricycloidea
- Class Stelleroidea
- Class Echinoidea
- Class Holothuroidea

15. Exoskeleton Of Arthopoda 5 Marks

External: not enveloped by living tissue

Protection

Secreted by underlying epidermis

- Waterproof barrier
- Chitin +/- calcium, lipoproteins

Modifications

- Can be site for muscle attachement
- Energy stores- flying
- Sensory receptors
- Gas exchange
- Bristles

Soft and permeable or hard, impermeable

- Between segments of body/appendages= thin + flexible
- Must be shed (ecdysis= molting) to allow growth
- Relatively heavy: Limits size

16. What Phyla Include Amoeboid Protozoan. Write Their Mode Of Locomotion.

Amoebozoa

It is a crawling-like type of movement accomplished by protrusion of cytoplasm of the cell involving the formation of pseudopodia

17. Write Names Of Phyla Of Ameboid Protozoa. Also Write Their Mode Of Locomotion. (3 Marks)

Contains 4 phyla:

- **Foraminifera**
- **Radiozoa**
- **Amoebozoa**
- **Heliozoa**

a) Most reproduce asexually through binary fission
b) Characterized by pseudopodia
c) Food is usually captured by phagocytosis
d) Body types range from free flowing to rigid with skeletal supports

18. Protozoa Life Cycle?

Protozoa have two-phase life cycles, alternating between proliferative stages (e.g., trophozoites) and dormant cysts. As cysts, protozoa can survive harsh conditions, such as exposure to extreme temperatures or harmful chemicals, or long

periods without access to nutrients, water, or oxygen for periods of time. (Internet)

19. History Of Plant Breeding?

Gregor Mendel's experiments with plant hybridization led to his establishing laws of inheritance. Once this work became well known, it formed the basis of the new science of genetics, which stimulated research by many plant scientists dedicated to improving crop production through plant breeding

20. Phylum Annelida? 5

Annelid, phylum name Annelida, also called segmented worm, any member of a phylum of invertebrate animals that are characterized by the possession of a body cavity (or coelom), movable

bristles (or setae), and a body divided into segments by transverse rings, or annulations, from which they take their name. (Internet)

Phylum Annelida

Class Polychaeta, Class Clitellata

Annelid Characteristics

Defining Characteristics

- One or more pairs of chitinous setae
- The phylum includes polychaetes, earthworms, leeches, and vestimentiferans
- True segmented worms
- Metameric segmentation

Body Structure

The body is a tube within a tube. The coelom is important to annelids for:The epidermis is what secretes the tough cuticle

Locomotion

On each side of the animal is a parapod (parapodia) consisting of fleshly lobes, which are supported by chitinous rods. Each parapod have setae, which can be sharp (protection), and aid in locomotion

Feeding

Annelids range from carnivores, herbivores, scavengers, deposit feeders, and filter feeders. With very few defenses, many remain in a burrow or secreted tube. Carnivores can capture prey with strong jaws and quickly drag it back to its burrow. Can use a muscular pharynx = eversible proboscis. (PPTS)

21. Explain Importance Of Biodiversity? 5 Marks

These Are As Follows:

a) Maintaining Balance of the Ecosystem.
b) Recycling And Storage of Nutrients,
c) Combating Pollution, And Stabilizing Climate, Protecting Water Resources,
d) Forming and Protecting Soil And Maintaining Eco-Balance.

e. Intrinsic Value: A Philosophical Concept of the Value of Something Independent

of Its Value To Anyone or Anything

22. Plants Breeding?

Plant breeding is the art and science of changing the traits of plants in order to produce desired characteristics. Plant breeding can be accomplished through many different techniques ranging from simply selecting plants with desirable characteristics for propagation, to methods that make use of knowledge of genetics and chromosomes, to more complex molecular techniques.

23. Gene Sequence

The sequence tells scientists the kind of genetic information that is carried in a particular DNA segment. For example, scientists can use sequence information to determine which stretches of DNA contain genes and which

stretches carry regulatory instructions, turning genes on or off. (Internet)

24. History Of Biodiversity And Its Milestones

Biodiversity is the result of 3.5 billion years of evolution. The origin of life has not been definitely established by science; however, some evidence suggests that life may already have been well-established only a few hundred million years after the formation of the earth. Until approximately 600 million years ago, all life consisted of

- Archaea
- Bacteria
- Protozoans and similar single-celled organisms

Historical Milestones of Biodiversity

- The history of biodiversity during the phanerozoic (the last 540 million years), starts with rapid growth during the Cambrian explosion—a period during which nearly every phylum of multicellular organisms first appeared. Over the next 400 million years or so, invertebrate diversity showed little overall trend and vertebrate diversity shows an overall exponential trend.
- This dramatic rise in diversity was marked by periodic, massive losses of diversity classified as mass extinction events. A significant loss occurred when rainforests collapsed in the carboniferous.
- The worst was the Permian Triassic extinction event, 251 million years ago.
- Vertebrates took 30 million years to recover from this event.
- The fossil record suggests that the last few million years featured the greatest biodiversity in history.
- However, not all scientists support this view, since there is uncertainty as to how strongly the fossil record is biased by the greater availability and preservation of recent geologic sections

- Some scientists believe that corrected for sampling artefacts, modern biodiversity may not be much different from biodiversity 300 million years ago., Whereas others consider the fossil record reasonably reflective of the diversification of life.
- Estimates of the present global macroscopic species diversity vary from 2 million to 100 million, with a best estimate of somewhere near 9 million, the vast majority arthropods. Diversity appears to increase continually in the absence of natural selection.

25. Why Breeding Crop Important?

Crop breeding is the art and science of improving important agricultural plants for the benefit of humankind. Crop breeders work to make our food, fiber, forage, and industrial crops more productive and nutritious. Crops provide for an expanding global population with increasing dietary expectations. (Internet)

26. Taxonomy

Taxonomy is the ordered division and naming of organisms.

OR

Taxonomy is a science that deals with naming, describing and classification of all living organisms including plants. Classification is based on behavioral, genetic and biochemical variations. Characterization, identification, and classification are the processes of taxonomy.

27. Phylogeny?

Phylogeny is the evolutionary history of a species or group of related species The discipline of systematics classifies organisms and determines their evolutionary relationships

28. What Is Bio Nomenclature?

In the 18th century, Carolus Linnaeus published a system of taxonomy based on resemblances. Two key features of his system remain useful today: two-part names for species and hierarchical classification. The two-part scientific name of a species is called a binomial. The first part of the name is the genus. The second part, called the specific epithet, is unique for each species within the genus. The first letter of the genus is capitalized, and the entire species name is italicized or underlined. Both parts together name the species.

29. Linnaeus Classification?

Carolus Linnaeus is the father of taxonomy, which is the system of classifying and naming organisms. One of his contributions was the development of a hierarchical system of classification of

nature. Today, this system includes eight taxa: domain, kingdom, phylum, class, order, family, genus, and species (Internet)

30. Three Point Of Phylogenetic? (Domain)

Bacteria, Archaea and Eukarya

31. What Is "Sustainability"?

Sustainability is a property of a human society in which ecosystems (including humans) are managed such that the conditions supporting present day life on Earth can continue.

32. Why An Organism's Evolutionary History Is Documented In Its Genome?

- Comparing nucleic acids or other molecules to infer relatedness is a valuable tool for tracing organisms' evolutionary history
- DNA that codes for rRNA changes relatively slowly and is useful for investigating branching points hundreds of millions of years ago
- mtDNA evolves rapidly and can be used to explore recent evolutionary events

33. Applied Ecology?

Applied Ecology: Using ecological principles to maintain conditions necessary for the continuation of present-day life on earth

34. Law Of Succession?

General correspondence between fossil and living forms in same geographical area Darwin used this observation to predict that fossils of ancient humans should be found in Africa

35. Evolution Of Organism Documents From Phylogeny? How Evolutionary Histories Convert Into Documents?

⇒ Comparing nucleic acids or other molecules to infer relatedness is a valuable tool for tracing organisms' evolutionary history

⇒ DNA that codes for rRNA changes relatively slowly and is useful for investigating branching points hundreds of millions of years ago

⇒ mtDNA evolves rapidly and can be used to explore recent evolutionary events

36. Lack Of Fossils Record

At the time of Darwin, the fossil record was VERY scanty. A great deal of progress has been made since, but it is far from finished.

The fossil record is relatively incomplete for several reasons:

- Soft tissues are rarely preserved
- Movement of the earth's crust has obliterated and/or covered many fossils
- Fossilization takes place only in certain types of habitats and favorable environments
- Paleontologists have not dug up every place on earth

37. Different In Ortholog And Paralog Gene?

Orthologs are genes that are related by vertical descent from a common ancestor and encode proteins with the same function in different species.

Paralogs are homologous genes that have evolved by duplication and code for protein with similar, but not identical functions."

38. Landscape Ecology

"Landscape ecology is concerned with spatial patterns in the landscape and how they develop, with an emphasis on the role of disturbance, including human impacts" (Smith and Smith). It is a relatively new branch of ecology, that employs Global Information Systems. The goal is to predict the responses of different organisms to changes in landscape, to ultimately facilitate ecosystem management

OR

Landscape ecology is the science of studying and improving relationships between ecological processes in the environment and particular ecosystems. This is done within a variety of landscape scales, development spatial patterns, and organizational levels of research and policy. (Internet)

39. Five Scientists Citing Reteach?

1. **Kerner** showed that the differences in growth form observed by him and Bonnier were the result of temporary adjustments to environmental variation and not hereditary changes in the experimental plants.
2. **Turesson's** studies provided evidence for genetic differences among populations.
3. **Clausen, Keck, and Hiesey** explored the extent and sources of morphological variation in plant populations, including both the influences of environment and genetics.
4. Case determined that the best predictor of chuckwalla, Sauromalus, body length was average winter rainfall.

- **Tracy's** laboratory growth experiments indicated that variation in body size among chuckwalla populations is at least partly determined by genetic differences among populations.

40. Microecology

The possibility of working with molecules on the scale of a few micrometers, given by advances in laser technology, has been very important for one of genomics' most conspicuous achievements, the development of the gene chip.

41. Bioinformatics

The field of biology specializing in developing *hardware* and *software* to store and analyze the huge amounts of data being generated by life scientists. (NIH) More than 20 different definitions can be found from Google.

42. Computing Technology

To assemble a genome from a series of sequences requires tremendous computational power. Extensive calculations are also necessary for the analysis of expression matrices and protein databases. Without the advent of high-speed computers and data-storage systems of vast capacity all this would have been impossible.

Consulting genome databases all over the world has become such normal practice that the scientific progress of any genomics laboratory has become completely dependent on communication with the rest of the World Wide Web. The Internet has become an indispensable part of genomics. The essence of genomics is that it is the study of the genome and its products as a unitary whole.

43. Define Genome

A genome is an organism's complete set of DNAs, including all of its genes. Each genome contains all of the information needed to build and maintain that organism.

44. Evolutionary Related Study To Genome Sequence? (What Are Phylogenetic Trees)

Explore genome evolution based on large data sets of DNA or protein sequences. Using entire genomes to infer a species tree (Eisen and Fraser 2003). Based on maximum genetic information and average out the anomalies. Has become the standard for reconstructing reliable phylogenies (Ciccarelli et al, 2006; Daubin et al. 2002).

45. Systematics?

Systematics (cladistics) is a method of taxonomic classification based on their evolutionary history. It was developed by Willi Hennig, a German entomologist, in 1950.

46. Ecological Genomics

A scientific discipline that studies the structure and functioning of a genome with the aim of understanding the relationship between the organism and its biotic and abiotic environment. **OR**

Biology and Informational Science

- The HGP changed how we view & practice biology.
- Biology is an informational science.
- Digital genome
- Environmental signals
- Biology has become a cross-disciplinary science.

47. Sequencing?

DNA sequencing is the process of determining the nucleic acid sequence – the order of nucleotides in DNA. It includes any method or technology that is used to determine the order of the four bases: adenine, guanine, cytosine, and thymine.

48. Enlist Three Major Technological Developments Of 1990s.

Three major technological developments of 1990s **a) Microtechnology**

b) Computing

c) Communication.

49. Why We Use Phylogenic Tree? Why Phylogenic Tree Is Important? Reasons To Use Phylogenetic Tree?

Phylogenetic is important because it enriches our understanding of how genes, genomes, species (and molecular sequences more generally) evolve. Phylogenetic is important because it enriches our understanding of how genes, genomes, species (and molecular sequences more generally) evolve. (Internet)

50. Biodiversity Importance In Term Of Food And Human?

Biodiversity creates resilience and is a key to mitigate the risks in agriculture particularly farming, from where we get most of our food. It ensures the world gets nutrients which is critical for good health and is also critical for conserving the ecosystem

51. Enlist Types Of Servers Used In Bioinformatics.

a) WWW servers
b) Database servers
c) Intensive computing servers

52. How Sequence Assembly Is Done Using Shoutgun Approaches?

DNA is broken up randomly into numerous small segments, which are sequenced using the chain termination method to obtain reads. Multiple overlapping reads for the targets DNA are obtained by performing several rounds of this fragmentation and sequencing. Computer programs then use the overlapping ends of different reads to assemble them into a continuous sequence.

53. Species/Gene Trees

Species tree (how are my species related?)

- Contains only one representative from each species
- When did speciation take place?
- All nodes indicate speciation events
- Gene tree (how are my genes related?)
- Often contains a number of genes from a single species.
- Nodes relate either to speciation or gene duplication events.

54. The Interactions Between The Genes Within The Genome And The Dynamic Character Of The Genome.

The interactions between the genes within the genome and the dynamic character of the genome

- Sketched By Dover (1999) As An Internal Tangled Bank. ❖ Idea Of Darwin (1859) ❖ Dover (1999 :
- 'External Tangled Bank' (The Ecology)
- The 'Internal Tangled Bank' (The Genome)

➢ The internal tangled bank

- It emphasizes the role of genetic turbulence (gene duplication, genetic sweeps, exon shuffling, transposition, etc.)
- Illustrates That There Is ample scope for 'innovation from within genetic turbulence

➢ The genomics revolution

Three major technological developments of 1990s **a)** Microtechnology

b) Computing

c) Communication.

55. Enlist Model?

Some models

- **Dynamic programming**
- **Hidden Markov Models (HMMs)**
- **Conditional random field (CRF)**
- **Support vector machines (SVMs)**

56. What Are The Three Layers Of Genome Annotation?

- Nucleotide- level annotation
- Protein- level annotation
- Process level annotation

57. What Is The Primer In PCR?

Attempts to pick up the gene by polymerase chain reaction (PCR) using primers from the then-known drosophila mt sequence remained unsuccessful.

58. Write At Least Three Reason To Use Phylogenetic.

Major reasons to use phylogenetics

- **Understand the lineage of different species:** Organizing principle to sort species into a taxonomy
- **Understand how various functions evolved:** Understand forces and constraints on evolution
- Perform multiple sequence alignment
- Predict gene function (phylogenetic footprint)

59. What Is The HIDDEN MARKOV MODEL?

It may generally be used in pattern recognition problems, anywhere there may be a model producing a sequence of observations. In bioinformatics, it has been used in sequence alignment, in silico gene detection, structure prediction, datamining literature and so on.

60. How Gene Can Be Identified?

Disease gene identification is a process by which scientists identify the mutant genotypes responsible for an inherited genetic disorder. Mutations in these genes can include single nucleotide

substitutions, single nucleotide additions/deletions, deletion of the entire gene, and other genetic abnormalities. (Internet)

In a fully sequenced genome, genes are found by scanning the sequence using genepredicting computer programmes and assigning putative functions by searching for similarities in already existing databases. (PPTS)

61. Importance Of Bacteria And Fungi?

Fungi and bacteria are essential to many of the most basic ecosystem processes: saprobic fungi break down fallen wood and litter returning nutrients to the soil; nitrogenfixing bacteria and mycorrhizal fungi assist plants to obtain nutrients from the soil; and many groups of fungi and bacteria cause diseases of plants

کمزور پر زور کرنا شرافت نہیں ہے کیونکہ جو پرندہ چیونٹی سے دانہ چھینے وہ کمینہ ہوتا ہے۔

عائزہ رائیٹس