Bio 14 Student Reference Guide

Prepared for Kingsborough Learning Center

Prepared by

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9. The limb of a bat and a limb of a cat are an example of:
   a) Analogous structures
   b) Homologous structures
   c) Adaptations
   d) Vestigial structures
10. This type of selection does not bring variation to a population:
   a) Sexual selection
   b) Intrasexual selection
   c) Asexual selection
   d) Sexual dimorphism
11. An origin of new species from a common ancestor that occurs in the event of any new opportunity is called:
   a) Biological species concept
   b) Morphological species concept
   c) Reinforcement
   d) Adaptive radiation
12. A change in allele frequency in a population is called:
   a) Macroevolution
   b) Microevolution
   c) Genes evolution
   d) Chromosome evolution
13. In Hardy- Weinberg equilibrium p represents?
   a) Heterozygotes
   b) Homozygous recessive allele
   c) Homozygous dominant allele
   d) b and c are correct
14. In Hardy- Weinberg equilibrium q represents?
   a) Heterozygotes
   b) Homozygous recessive allele
   c) Homozygous dominant allele
   d) B and c are correct
15. The five conditions of H-W equilibrium to be met for not evolving population are:
   a) Mutation, natural selection, gene flow, extremely large population size, random mating
   b) No mutation, no natural selection, no gene flow, extremely large population size, random mating
   c) No mutation, no natural selection, no gene flow, extremely small population size, random mating
   d) No mutation, no natural selection, no gene flow, extremely large population size, no random mating
16. In Hardy- Weinberg equilibrium 2pq represents?
   a) Homozygous
   b) Heterozygous
   c) Homozygous and heterozygous
   d) Homozygous only

17. What is the Hardy – Weinberg equilibrium equation?
    a) $p^2+2pq+q^2=1$
    b) $p^2+3pq+q^2=2$
    c) $2p+2pq+2q=1$
    d) $pq+2pq+pq=1$
18. In a population of 50 individuals, 15 are homozygous dominant (WW), 20 are heterozygous (Ww), and 15 are homozygous recessive (ww). Calculate the frequency of dominant and recessive alleles and determine what the percentage of homozygous dominant, recessive and heterozygous individuals is.
    Alleles: 50 dominant + 50 recessives
    individuals: 25% dominant + 25% recessive + 50% heterozygotes

19. Sickle cell anemia is a recessive disease that affects about 90,000 people in the USA. The research shows that it affects approximately 1/600 African - Americans and 1/1700 Hispanics.
    A) Calculate what % of African – Americans are affected by the disease?
    0.0625
    B) Calculate the frequency of the homozygous recessive genotype?
    0.000625
    C) What is the frequency of a recessive allele in the population?
    0.02
    D) What is the frequency of the dominant allele in the population?
    0.98
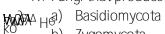   E) What is the frequency of the heterozygotes?
    0.04
20. Eukaryotic cells appeared on the Earth.
    a) 1.5 mya
    b) 2.5 mya
    c) 2.5 bya
    d) 3.5 bya
21. Changes in allele frequencies are the result of:
    a) Natural selection only
    b) Mutation
    c) Natural selection and mutation
    d) Natural selection, genetic drift, gene flow, mutation
22. If the population of mice was predicted in white, grey, and black color and the introduced predator prefers only the white color mouse, that is called—htion of m
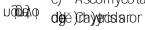
23. This type of selection results from a predator prefers to kill individuals from both extremes of the population
    a) Stabilizing selection
    b) Disruptive selection
    c) Radial selection
    d) Directional selection
24. Very small circular RNA molecules that do not encode proteins are:
    a) Virus
    b) Protists
    c) Bacteria
    d) Viroid
25. Infectious proteins that cause mad cow disease in cattle are called:
    a) Prions
    b) Virus
    c) Protists
    d) Viroid
26. The most beneficial role of protists in the biosphere is their ability to work as:
    a) Producers
    b) Heterotrophs
    c) Omnivores
    d) Carnivores
27. The Fungi cell wall is composed of:
    a) Sucrose
    b) Cellulose
    c) Chitin
    d) Lactose
28. The fungi body is made of thin filaments called:
    a) Lichens
    b) Mycorrhizae
    c) Hyphae
    d) Chitin
29. Bacteria lack:
    a) Ribosomes
    b) Nucleus and membrane bonded organelles
    c) Cell wall
    d) Plasma membrane
30. Gram-positive bacteria after gram staining procedure appear:
    a) Blue
    b) Pink
    c) Green
    d) Purple

40. The bacterial cell wall is made up of:
    a) Peptidoglycan layer
    b) Sugar layer
    c) Peptide layer
    d) Lipid layer
41. A thin layer of peptidoglycan covered by cell membrane from either side is characteristic for:
    a) Gram-positive bacteria
    b) Gram-negative bacteria
    c) All bacteria
    d) None of the bacteria
42. These structures are formed in a bacterial cell when occurring harsh environmental conditions:
    a) Exospores
    b) Endospores
    c) Spores
    d) Sporangia
43. Genetic information in the form of rings carried by a bacterial cell is called:
    a) Plastid
    b) Gene
    c) Chromosome
    d) Plasmid
44. The bacteriophage foreign DNA assembled into bacterial DNA is an example of:
    a) Lysogenic cycle
    b) Lytic cycle
    c) Binary fusion
    d) Binary fission
45. What is the name of the virus that infects bacteria?
    a) Bacteriophage
    b) Coronavirus
    c) Staph infection
    d) Rotavirus
46. Malaria is caused by:
    a) Bacteria: *Staphylococcus aureus*
    b) Bacteria: *Staphylococcus*
    c) *Red algae*
    d) Protist: *Plasmodium falciparum*
47. How did protists become diverse?
    a) By binary fission
    b) By reproduction
    c) By replication
    d) By primary and secondary endosymbiosis
48. What is an ancestor of fungi?
    a) An aquatic, single-celled, flagellated protist
    b) Bacteria
    c) Virus
    d) Plant

49. Fungi that produce sporangiospores for asexual reproduction:
   a) Basidiomycota
   b) Zygomycota
   c) Ascomycota
   d) Chytridia or

50. Fungi sexual reproduction undergoes in the order:
   a) Plasmogamy - Heterokaryotic stage - Karyogamy
   b) Karyogamy - Heterokaryotic stage - Plasmogamy
   c) Plasmogamy - Karyogamy - Heterokaryotic stage
   d) All answers are w

58. Which supergroup fungi and animals belong to?
    a) Unikonta
    b) Excavata
    c) Chromalveolata
    d) Rhizaria
    e) Archaeplastida
59. Unikonts that include protists closely related to fungi and animals are classified as:
    a) Amoebozoans and Opisthokonts
    b) Alveolates and Stramenophiles
    c) a and b are correct
    d) a and b are wrong
60. The closest relatives of the land plants are:
    a) Golden algae
    b) Diatoms
    c) Brown algae
    d) Red algae and green algae
61. Chromalveolates originated by:
    a) Primary endosymbiosis
    b) Secondary endosymbiosis
    c) Tertiary endosymbiosis
    d) All answers are wrong
62. The plant hormone that promotes cells division is called:
    a) Cytokinin
    b) Ethylene
    c) Abscisic acid
    d) Gibberellins
63. The plant hormone that promotes the ripening of fruit is called:
    a) Ethylene
    b) Cytokinin
    c) Gibberellins
    d) Abscisic acid
64. The plant hormone responsible for dormancy in seeds is called:
    a) Cytokinin
    b) Abscisic acid
    c) Gibberellins
    d) Ethylene
65. Plant shoots growing up against gravity is an example of:
    a) Positive gravitropism
    b) Negative gravitropism
    c) Lack of gravitropism
    d) Strong gravitropism

66. In the life cycle of nonvascular plants, antheridia and archegonia are produced by:
    a) Sporophyte
    b) Gametophytes
    c) Meiosis
    d) mitosis
67. Which nonvascular plant life cycle requires moisture for a ssspc

74.

82. The sporophyte in plants produces haploid spores by the process of:
    a) Double fertilization
    b) Meiosis
    c) Mitosis
    d) Cross-pollination
83. Which part of a flower becomes a fruit:
    a) Ovary
    b) Ovule
    c) Petal
    d) Sepal
84. What is the ploidy le

91. Birds and mammals that are warmed by heat generated by metab

100. A graph of the population growth where the amount of food limits the number of offf

Answers:

1. Two different species having a similar-looking structure that they use to perform similar tasks is an example:
   - b) Convergent evolution
2. The process in which dogs are selectively bred for favorable traits is called:
   - c) Artificial selection
3. Possessing favorable traits to survive and reproduce in a population is called the theory of:
   - a) Natural selection
4. The type of speciation results from two populations of species separated geographically:
   - a) Allopatric speciation
5. Examples of genetic drift is/are:
   - c) Bottleneck effect and founder effect
6. Who is the father of evolution?
   - d) Darwin
7. Oxygen appears in the atmosphere due to:
   - a) Photosynthetic cyanobacteria
8. The wings of fly and wings of birds are an example of:
   - b) Analogous structures
9. The limb of a bat and a limb of a cat are an example of:
   - b) Homologous structures
10. This type of selection does not bring variation to a population:
    - c) Asexual selection
11. An origin of new species from a common ancestor that occurs in the event of any new opportunity is called:
    - d) Adaptive radiation
12. A change in allele frequency in a population is called:
    - b) Microevolution
13. In Hardy- Weinberg equilibrium p represents?

15 WW = 30 dominant alleles
20 Ww = 20 dominant + 20 recessive alleles
15 ww = 30 recessive alleles
Total number of dominant alleles = 30+20=50, 50% of 100 alleles
Total number of recessive alleles = 20+30=50, 50% of 100 alleles
p=0.5; q=0.5
p+q=1
0.5+0.5=1
p2+2pq+q2=1
p2= (0.5)2=0.25 homozygous dominant individuals=25%
q2= (0.5)2=0.25 homozygous recessive individuals=25%
2pq=2x0.5x0.5=0.5 heterozygous individuals=50%

19. Sickle cell anemia is a recessive disease that affects about 90,000 people in the USA. The research shows that it affects approximately 1/600 African - Americans and 1/1700 Hispanics.
    A) Calculate what % of African – Americans are affected by the disease?
    q^2 = 1/1600 x 100 = 0.0625
    B) Calculate the frequency of the homozygous recessive genotype?
    q^2 = 1/1600 = 0.000625
    C) What is the frequency of recessive alleles in the population?
    q^2 = 1/1600 = 0.000625
    q = 0.02
    D) What is the frequency of the dominant allele in the population?
    p + q = 1
    p = 1 - q
    p = 1 - 0.02 = 0.98
    E) What is the frequency of the heterozygotes?
    2pq = 2 x 0.02 x 0.98 = 0.04

20. Eukaryotic cells appeared on the Earth.
    - c) 2.5 bya
21. Changes in allele frequencies are the result of:
    - d) Natural selection, genetic drift, gene flow, mutation
22. If the population of mice was predicted in white, grey, and black color and the introduced predator prefers only the white color mouse, that is called:
    - d) Directional selection
23. This type of selection results from a predator prefers to kill individuals from both extremes of the population
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26. The most beneficial role of protists in the biosphere is their ability to work as:
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27. The Fungi cell wall is composed of:
    - c) Chitin
28. The fungi body is made of thin filaments called:
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29. Bacteria lack:
    - b) Nucleus and membrane bonded organelles
30. Gram-positive bacteria after gram staining procedure appear:
    - d) Purple
31. Gram-negative bacteria after gram staining procedure appear:
    - b) Pink
32. Archaea that thrive in a very high pH are called:
    - b) Alkalophile
33. Archaea that thrive at a very low pH are called:
    - a) Acidophile
34. Mutualistic symbiosis of fungi with protists is called:
    - b) Lichens
35. The mutualistic relationship between plant roots and fungi:
    - a) Mycorrhizae
36. The underground part of the fungi body is called:
    - b) Mycelium
37. The transfer of bacterial DNA from one cell to another through the pili is called:
    - d) Conjugation
38. The transfer of DNA into bacteria by bacteriophage is called:
    - a) Transduction
39. Bacteria take up foreign DNA from the environment is called:
    - b) Transformation
40. The bacterial cell wall is made up of:
    - a) Peptidoglycan layer
41. A thin layer of peptidoglycan covered by cell membrane from either side is characteristic for:
    - b) Gram-negative bacteria
42. These structures are formed in a bacterial cell when occurring harsh environmental conditions:
    - b) Endospores
43. Genetic information in the form of rings carried by a bacterial cell is called:
    - d) Plasmid
44. The bacteriophage foreign DNA assembled into bacterial DNA is an example of:
    - a) Lysogenic cycle
45. The name of viruses that infect bacteria:
    - a) Bacteriophage
46. Malaria is caused by:
    - d) Protist: *Plasmodium falciparum*
47. How did protists become diverse?
    - d) By primary and secondary endosymbiosis

70. What is the role of the xylem?
   - a) Water transport from the sink (storage root) to the

91. Birds and mammals that are warmed by heat generated by metabolism are:
    -