24 CHAPTER

EVOLUTION

1. **The mechanism of evolution called "natural selection" was proposed by:**

    (A) Lamarck   (B) Darwin

    (C) Cuvier   (D) Mendel

2. **The endosymbiont hypothesis was proposed by:**

    (A) Lamarck   (B) Wallace

    (C) Margulis   (D) Lyell

3. **The evolutionary hypothesis that "the prokaryotic cell membrane invaginated to enclose its copy of genetic material" is said to be:**

    (A) Ecotsymbiont hypothesis   (B) Membrane invagination hypothesis

    (C) Unit membrane hypothesis   (D) Endosymbiont hypothesis

4. **The integration of the principles of genetics and evolution is called as:**

    (A) Lamarckism   (B) Theory of special creation

    (C) Neo Darwinism   (D) Mendelism

5. **How many finches did Darwin collect on galapagos island?**

    (A) 30 types   (B) 20 types

    (C) 13 types   (D) 25 types

6. **The study of distribution of living things on earth is called:**

    (A) Biogeography   (B) Biology

    (C) Comparative anatomy   (D) Molecular biology

7. **The breeding of domesticated plants and animals refers to:**

    (A) Artificial selection   (B) Selection by chance

    (C) Wild selection   (D) Natural selection

8. **The shuffling of alleles due to meiosis and random fertilization having no effect on over all genetic structure of a population signifies:**

    (A) Went's theorem
    (B) Fischer's theorem
    (C) Hardy-Weinberg theorem
    (D) Binomial theorem

9. **In Hardy Weinberg's equation i.e., $p^2 + 2pq + q^2 = 1$ p-stands for:**

    (A) None
    (B) Gene frequency of one allele
    (C) Frequency of whole gene pool
    (D) Both (A) and (B)

10. **The tropical rain forests have been reduced to what percentage of their original extent?**

    (A) 44%
    (B) 10%
    (C) 84%
    (D) 20%

11. **The smallest biological unit that can evolve over time is:**

    (A) A community
    (B) A population
    (C) A species
    (D) An ecosystem

12. **The first eukaryotic cell appeared about how many years ago?**

    (A) 1.5 billion
    (B) 2.4 billion
    (C) 3.9 billion
    (D) 3.5 billion

13. **The "ontogeny recapitulates phylogeny" supports the evidence from:**

    (A) Comparative embryology
    (B) Fossil record
    (C) Comparative anatomy
    (D) Molecular biology

14. **If all the members of a population are homozygous for the same allele then that allele is:**

    (A) Variable
    (B) Abnormal
    (C) Fixed
    (D) Normal

15. **The species which are near to become endangered are called as:**

    (A) Threatened species
    (B) Endangered species
    (C) Wild species
    (D) None

16. **The study of total aggregate of genes in a population at any one time is known as:**

    (A) Population genetics
    (B) Molecular biology
    (C) Embryology
    (D) Cytogenetics

17. **As per natural selection the survival in struggle for existence is not random. It depends on surviving individuals:**

    (A) Interaction

    (B) Ancestry

    (C) Hereditary constitution

    (D) Phenotype

18. **Which one of the following is not declared as an extinct species in Pakistan?**

    (A) Asian lion

    (B) Green parrot

    (C) Indian rhino

    (D) Cheetah

19. **The rudimentary structures that had important functions in ancestors in the remote past are said to be:**

    (A) Functional organs

    (B) Vestigial organs

    (C) Visceral organs

    (D) Assimilatory organs

20. **The level of classification between species and family is called as:**

    (A) Genus

    (B) Phylum

    (C) Division

    (D) Group

21. **Theory of special creation:**

    (A) 60°C

    (B) Lynn Margulis

    (C) Darwin

    (D) C. Linnaeus

22. **Archaeobacteria:**

    (A) 120°C

    (B) Lynn Margulis

    (C) C. Linnaeus

    (D) Darwin

23. **Edosymbiont hypothesis:**

    (A) C. Linnaeus

    (B) Lynn Margulis

    (C) 120°C

    (D) Darwin

24. **H.M.S. Beagle:**

    (A) C. Linnaeus

    (B) 120°C

    (C) Lynn Margulis

    (D) Darwin

25. **Inheritance of acquired characteristics:**

    (A) Sedimentary rocks

    (B) Lamarck

    (C) Homologus organs

    (D) Analogous organs

26. **Fossils:**

    (A) Sedimentary rocks   (B) Lamarck

    (C) Homolgous organs   (D) Hydrothermal vents

27. **Fore limbs of man and wings of bat:**

    (A) Hydrothermal vents   (B) Sedimentary rocks

    (C) Analogous organ   (D) Homologous organs

28. **Hot springs:**

    (A) Homologous organs   (B) Sedimentary rocks

    (C) Analogous organs   (D) Hydrothermal vents

29. **Eukaryotic cells:**

    (A) Mutation

    (B) Lamarckism

    (C) Membrane invagination hypothesis

    (D) Population

30. **Neo Darwinism:**

    (A) Modern synthesis   (B) Population

    (C) Mutation   (D) Lamarckism

31. **A group of interbreeding individuals:**

    (A) Lamarckism   (B) Membrane invagination hypothesis

    (C) Modern synthesis   (D) Population

32. **Change in genetic make up:**

    (A) Lamarckism   (B) Modern synthesis

    (C) Population   (D) Mutation

33. **Wings of bats:**

    (A) Fixed   (B) Hardy Weinberg theorem

    (C) Convergent evolution   (D) Variable

34. **$(p + q)^2$:**

    (A) Variable   (B) Hardy Weinberg theorem

    (C) Fixed   (D) Extinct species

35. **Asian lion:**

    (A) Extinct species   (B) Hardy Weinberg theorem

    (C) Convergent evolution   (D) Fixed

36. **Homozygous:**

    (A) Extinct species   (B) Fixed

    (C) Hardy Weinberg theorem   (D) Convergent evolution

37. **Essay on the principle of population:**

    (A) Analogous organs   (B) Evidence of evolution

    (C) Finches   (D) Cuvier

38. **Galapagos:**

    (A) Evidence of evolution   (B) Analogous organs

    (C) Cuvier   (D) Finches

39. **Functionally alike but structurally different:**

    (A) Evidence of evolution   (B) Fishes

    (C) Analogous organs   (D) Cuvier

40. **Comparative anatomy:**

    (A) Analogous organs   (B) Evidence of evolution

    (C) Fishes   (D) Cuvier

41. **The origin of species:**

    (A) Genetic drift   (B) Darwin

    (C) Glycogen   (D) Vestigial organ

42. **Ear muscles in man:**

    (A) Genetic drift   (B) Vestigial organ

    (C) Darwin   (D) Respiratory protein

43. **Change in the frequency of alleles occurring by chance:**

    (A) Darwin   (B) Genetic drift

    (C) Vestigial organ   (D) Glycogen

44. **Cytochrome:**

    (A) Vestigial organ   (B) Genetic drift

    (C) Respiratory protein   (D) Darwin

45.   **The theory of natural selection was supported by:**

   (A)   Darwin   **(B)**   Aristotle

   (C)   Linnaeus   **(D)**   Lamarck

46.   **The theory of natural selection was formulated by:**

   (A)   Darwin   **(B)**   Linnaeus

   (C)   Lamarck   **(D)**   Aristotle

47.   **The essay "Principle of population" was published by:**

   (A)   Cuvier   **(B)**   Lyell

   (C)   Malthus   **(D)**   Mendel

48.   **Match theory of natural selection with one of the followings:**

   (A)   Natural selection   **(B)**   Evolution

   (C)   Divine creation   **(D)**   Principle of population

49.   **Principle of geology was published by:**

   (A)   Darwin   **(B)**   Lyell

   (C)   Linnaeus   **(D)**   Lamarck

50.   **Papers on inheritance was published by:**

   (A)   Cuvier   **(B)**   Lyell

   (C)   Malthus   **(D)**   Mendel

51.   **Match catastrophism with one of the following:**

   (A)   Lyell   **(B)**   Cuvier

   (C)   Malthus   **(D)**   Mendel

52.   **The prokaryotes arise how many years ago?**

   (A)   1.5 billion   **(B)**   3.5 million

   (C)   3.5 billion   **(D)**   4.5 billion

53.   **The bacteria living in hydrothermal vent are:**

   (A)   Cyanobacteria   **(B)**   Eubacteria

   (C)   Archeobacteria   **(D)**   All of the above

54.   **Archeobacteria can tolerate temperature upto:**

   (A)   100°C   **(B)**   105°C

   (C)   110°C   **(D)**   120°C

55. The compound used first by photosynthetic organism as a hydrogen sources was:

(A) Water (B) Methane

(C) Hydrogen sulphide (D) Hydrogen per oxide

56. Ozone is formed from:

(A) Water (B) Hydrogen

(C) CO_2 (D) Oxygen

57. Enough protective ozone was built about how many years ago?

(A) 320 million (B) 420 million

(C) 420 billion (D) 320 billion

58. Life can form abiotically only in:

(A) Oxidizing environment (B) Reducing environment

(C) Both (A) and (B) (D) None of the above

59. The idea of endosymbiont was proposed by:

(A) Cuvier (B) Lyell

(C) Malthus (D) Margulis

60. In endosymbiont idea, flagella are formed from:

(A) Aerobic bacteria (B) Cyanobacteria

(C) Spirochete (D) None of the above

61. The chloroplast of the eukaryotes was formed from:

(A) Aerobic bacteria (B) Spirochete

(C) Cyanobacteria (D) None of the above

62. The idea of inheritance of acquired character was proposed by:

(A) Darwin (B) Lyell

(C) Linnaeus (D) Lamarck

63. The island near South American coastline is:

(A) Iceland (B) Galapagos

(C) Cape Verde (D) None of the above

64. Darwin came back to Great Britain in:

(A) 1932 (B) 1934

(C) 1936 (D) 1939

65. **Another theory of natural selection other than Darwin was developed by:**

    (A) Wallace   (B) Lyell

    (C) Linnaeus   (D) Lamarck

66. **Descent with modification means:**

    (A) Similar characters   (B) Same ancestor

    (C) Different ancestors   (D) None of the above

67. **Population genetics emphasized on:**

    (A) Acquired characters   (B) Qualitative characters

    (C) Quantitative characters   (D) None of the above

68. **Modern synthesis includes:**

    (A) Taxonomy   (B) Population genetics

    (C) Palaeontology   (D) All of the above

69. **Match divergent evolution with one of the following:**

    (A) Analogy   (B) Anatomy

    (C) Homology   (D) Palaeontology

70. **Vermiform appendix in man is:**

    (A) Analogous structure   (B) Homologous structure

    (C) Vestigial structure   (D) None of the above

71. **Which of the followings is not a vestigial organ?**

    (A) Appendix   (B) Skeleton of whale

    (C) Pelvic in man   (D) Leg bone in snakes

72. **Which is mismatched for homologous structures?**

    (A) Foreleg of horse   (B) Wing of birds

    (C) Wing of insects   (D) Flipper of whale

73. **Which is mismatched for analogous structures?**

    (A) Forelimb of bat   (B) Wing of birds

    (C) Wing of insects   (D) Flipper of whale

74. **In terrestrial vertebrates, the gills are modified to form:**

    (A) Ear muscles   (B) Eustachian tube

    (C) Lungs   (D) Larynx

75. **The proteins found in all aerobic species are:**

    (A) Haemoglobin   (B) Cytochrome

    (C) Albumin   (D) Keratin

76. **The total aggregate gene of population is:**

    (A) Poly gene   (B) Gene pool

    (C) Gene interaction   (D) None of the above

77. **Number of homozygous dominant flowers in a population is 320 and number of heteozygous flowers is 160. Number of dominant alleles in this population is:**

    (A) 320   (B) 600

    (C) 800   (D) 100

78. **The mammal which live only in America is:**

    (A) Kangaroo   (B) Elephant

    (C) Armadillos   (D) Echidna

79. **The oldest known fossils:**

    (A) Fish   (B) Prokaryotes

    (C) Protozoans   (D) Algae

80. **Fossil record shows that the earliest known vertebrate fossils of:**

    (A) Reptiles   (B) Fishes

    (C) Amphioxus   (D) Amphibians

81. **The second oldest vertebrate fossil:**

    (A) Reptiles   (B) Fishes

    (C) Amphioxus   (D) Amphibians

82. **The latest fossil found is:**

    (A) Reptiles   (B) Birds

    (C) Amphioxus   (D) Amphibians

83. **Which of the following is a fossil?**

    (A) Cast   (B) Impression

    (C) Resin   (D) None of the above

84. **Most fossils are found in:**

(A) Hard rocks

(B) Sedimentary rocks

(C) Soft rocks

(D) Ignitions rocks

85. **The structures which have common origin but different function:**

(A) Analogous structures

(B) Homologous structures

(C) Vestigial structures

(D) None of the above

86. **The structures which have similarity in function are:**

(A) Analogous structures

(B) Homologous structures

(C) Vestigial structures

(D) None of the above

87. **Match convergent evolution with one of the followings:**

(A) Analogy

(B) Homology

(C) Anatomy

(D) Paleontology

88. **The number of alleles of a recessive character in a population is 300 out of total of 100. Its frequency is:**

(A) 0.7

(B) 0.3

(C) 0.5

(D) 0.4

89. **There are 160 heterozygous plants in total of 500. Its genotypic frequency will be:**

(A) 0.64

(B) 0.32

(C) 0.04

(D) 0.44

90. **Hardy-Weinberg law is used to measure:**

(A) Gene pool

(B) Allelic ratio

(C) Allelic frequency

(D) None of the above

91. **In allelic frequency P + Q =**

(A) 0.2

(B) 0.8

(C) 1.0

(D) 2.0

92. **In a population P = 0.8 and Q = 0.2, the allelic frequency of the heterozygous will be:**

(A) 0.64

(B) 0.32

(C) 0.04

(D) 1.00

93. **In a population P = 0.8 and Q = 0.2, the allelic frequency of the recessive trait will be:**

    (A) 0.64   (B) 0.32

    (C) 0.04   (D) 1.00

94. **Which of the followings cannot change allelic frequency?**

    (A) Genetic drift   (B) Random mating

    (C) Section   (D) Migration

95. **Which of the followings can change allelic frequency?**

    (A) Genetic drift   (B) Migration

    (C) Section   (D) All of the above

96. **The forest of the world have been reduced by:**

    (A) 30%   (B) 44%

    (C) 54%   (D) 60%

97. **The main reason of the extinction of the species is:**

    (A) Pollution   (B) Over population

    (C) Habitat destruction   (D) Rain

98. **The measure to prevent the extinction of species is:**

    (A) Pollution control   (B) Supply of water

    (C) National parks   (D) Breading

99. **The evolution of photosynthetic prokaryotes took place due to:**

    (A) High concentration of CO_2 in atmosphere

    (B) High concentration of O_2 in atmosphere

    (C) Limited supply of nutrient sources

    (D) High temperature in the primitive environment

100. **The theory of special creation says:**

    (A) All living organisms formed from ancestors

    (B) All living organisms formed spontaneously

    (C) All living organisms formed by divine

    (D) None of the above

101. **The theory of natural selection says:**

(A) All living organisms formed from ancestors

(B) All living organisms formed spontaneously

(C) All living organisms formed by divine

(D) None of the above

102. **Evolution is a:**

(A) Change of shape of body　　(B) Change of body form

(C) Change of gene frequency　　(D) Change of body organs

103. **The evolution of aerobic prokaryotes took place due to:**

(A) High concentration of CO_2 in atmosphere

(B) High concentration of O_2 in atmosphere

(C) Limited supply of nutrient sources

(D) High temperature in the primitive environment

104. **An acquired character is:**

(A) A character inherited by an organism

(B) It can pass from parent to offspring

(C) It never passes from parent to offspring

(D) It provides raw material for evolution

105. **According to endosymbiotic theory mitochondria is:**

(A) Cellular body which produce energy

(B) Anaerobic bacteria which produces energy

(C) Aerobic bacteria which produces energy

(D) Photosynthetic bacteria undergoes photosynthesis

106. **According of endosymbiotic theory chlorophyll is:**

(A) Cellular body which produce energy

(B) Anaerobic bacteria which produce energy

(C) Aerobic bacteria which produce energy

(D) Photosynthetic bacteria undergoes photosynthesis

107. **The main objection on Lamarckism was that:**

(A) A character inherited by an organism

(B) It can pass from parent to offspring

(C) It cannot pass from parent to offspring

(D) It provides raw material for evolution

108. **The observation of the Darwin about the species of Galapagos was that:**

(A) They do not resemble with other species

(B) They show resemblance with the South American species

(C) They have ancestors only in Galapagos

(D) None of the above

109. **Descent with modification means:**

(A) All organisms show resemblances

(B) The organisms do not show resemblances

(C) The organisms show resemblances but later change

(D) None of the above

110. **Neo Darwinism means:**

(A) Concept of evolution on the basis of population genetics

(B) Concept of evolution on the basis of Mendalism

(C) Concept of evolution on the basis of natural selection

(D) All of the above

111. **Homologous structures:**

(A) Have same structures but different functions

(B) Have same functions but different structures

(C) Have different structures and function

(D) None of the above

112. **Analogous structures:**

(A) Have same structures but different functions

(B) Have same functions but different structures

(C) Have different structures and functions

(D) None of the above

113. **Which is actual evidence supporting the endosymbiotic theory for the origin of eukaryotes?**

    (A) Fossil evidence suggest early eukaryotes ate Proteobacteria

    (B) Free-living mitochondria still exist in some environments

    (C) Mitochondria and chloroplasts have their own DNA

    (D) All of the above are true

114. **Why do scientists think RNA, rather than DNA, may have been the original genetic material?**

    (A) Most organisms on Earth use RNA as their genetic material

    (B) The simplest life forms, viruses, use RNA

    (C) RNA is more stable than DNA

    (D) RNA has the ability to catalyze a few simple, chemical reactions

115. **A total of 1700 US Caucasian newborns have cystic fibrosis. C for normal is dominant over c for cystic fibrosis. What percent age of the above population have cystic fibrosis (cc of q^2)?**

    (A) 0.059%   (B) 0.023%

    (C) 0.015%   (D) 0.034%

116. **How many of the 1700 (IN THE ABOVE STATEMENT) of the population are homozygous normal?**

    (A) 1260   (B) 1620

    (C) 100   (D) 1001

117. **How many of the 1700 (IN THE ABOVE STATEMENT) in the population are heterozygous (carrier)?**

    (A) 79.56%   (B) 86%

    (C) 92.15%   (D) 22.54%

118. **If 9% of an African population is born with a severe form of sickle-cell anemia (ss), what percentage of the population will be more resistant to malaria because they are heterozygous(Ss) for the sickle-cell gene?**

    (A) 42%   (B) 20%

    (C) 30%   (D) 0%

119. There are 100 students in a class. Ninety-six did well in the course whereas four blew it totally and received a grade of F. Sorry. In the highly unlikely event that these traits are genetic rather than environmental, if these traits involve dominant and recessive alleles, and if the four (4%) represent the frequency of the homozygous recessive condition, please calculate the following:

(a) The frequency of the recessive allele:

(A) 20%   (B) 60%

(C) 34%   (D) 47%

(b) The frequency of the dominant allele:

(A) 20%   (B) 60%

(C) 80%   (D) 10%

(c) The frequency of heterozygous individuals:

(A) 22%   (B) 24%

(C) 26%   (D) 32%

120. A very large population of randomly-mating laboratory mice contains 35% white mice. White coloring is caused by the double recessive genotype, "aa" genotypic frequencies for this population is:

(A) 5   (B) 6

(C) 0   (D) 1

121. A rather large population of Biology instructors have 395 red-sided individuals and 557 tan-sided individuals. Assume that red is totally recessive, please calculate the following:

(a) The allele frequencies of each allele:

(A) 0.355   (B) 0.620

(C) 0.0222   (D) 0.156

(b) The expected genotype frequencies:

(A) 0.216   (B) 0.316

(C) 0.116   (D) 0.416

(c) The number of heterozygous individuals that you would predict to be in this population:

(A) About 436   (B) 480

(C) 225   (D) 400

(d) **The expected phenotype frequencies:**

(A) 0.312   **(B)** 0.584

(C) 0.211   **(D)** 0.416

(e) **Conditions happen to be really good this year for breeding and next year there are 1.245 young "potential" Biology instructors. Assuming that all of the Hardy-Weinberg conditions are met, how many of these would you expect to be red-sided and how many tan-sided?**

(A) 518 red   **(B)** 215 red

(C) 307 red   **(D)** 111 red

Answers

Sr.	Ans.	Sr.	Ans.	Sr.	Ans.	Sr.	Ans.	Sr.	Ans.
1.	(B)	2.	(C)	3.	(B)	4.	(C)	5.	(C)
6.	(A)	7.	(A)	8.	(C)	9.	(B)	10.	(A)
11.	(C)	12.	(A)	13.	(A)	14.	(C)	15.	(A)
16.	(A)	17.	(C)	18.	(B)	19.	(B)	20.	(A)
21.	(D)	22.	(A)	23.	(B)	24.	(D)	25.	(B)
26.	(A)	27.	(D)	28.	(D)	29.	(C)	30.	(A)
31.	(D)	32.	(D)	33.	(C)	34.	(B)	35.	(A)
36.	(B)	37.	(D)	38.	(D)	39.	(C)	40.	(B)
41.	(B)	42.	(B)	43.	(B)	44.	(C)	45.	(A)
46.	(B)	47.	(C)	48.	(C)	49.	(B)	50.	(D)
51.	(A)	52.	(C)	53.	(C)	54.	(D)	55.	(C)
56.	(D)	57.	(B)	58.	(B)	59.	(D)	60.	(C)
61.	(C)	62.	(D)	63.	(B)	64.	(C)	65.	(A)
66.	(B)	67.	(C)	68.	(D)	69.	(C)	70.	(C)
71.	(C)	72.	(C)	73.	(D)	74.	(B)	75.	(B)
76.	(B)	77.	(C)	78.	(C)	79.	(B)	80.	(B)
81.	(C)	82.	(B)	83.	(D)	84.	(B)	85.	(B)
86.	(A)	87.	(A)	88.	(B)	89.	(B)	90.	(C)
91.	(C)	92.	(B)	93.	(C)	94.	(B)	95.	(D)
96.	(B)	97.	(C)	98.	(C)	99.	(C)	100.	(C)
101.	(A)	102.	(C)	103.	(B)	104.	(C)	105.	(D)
106.	(C)	107.	(C)	108.	(B)	109.	(C)	110.	(D)

Sr.	Ans.	Sr.	Ans.	Sr.	Ans.	Sr.	Ans.	Sr.	Ans.
111.	(A)	112.	(B)	113.	(C)	114.	(B)	115.	(A)
116.	(B)	117.	(A)	118.	(A)	119.	(a) (A) (b) (C) (c) (D)	120.	(D)
121.	(a) (D) (b) (D) (c) (A) (d) (D) (e) (A)								