Cosmo School

Multiple Choice Questions

Chapter Twelve

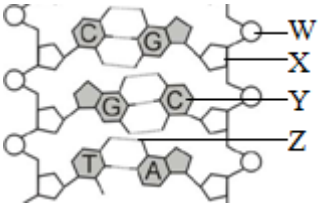
Heredity in organisms and evolution

Name : .....*Date:* .....

Class : X *Subject : Biology*

1. What is called the process by which traits from father and mother pass to their offspring?
   a) Meiosis *b)* Heredity
   c) Fertilization *d)* Reproduction
2. In which branch of biology is heredity discussed?
   a) Genetics *b)* Evolution
   c) Embryology *d)* Biotechnology
3. Which one is not the heredity material of human being?
   a) Gene *b)* RNA
   c) DNA *d)* Chromosome
4. Which one is the main heredity material?
   a) Gene *b)* RNA
   c) DNA *d)* Chromosome
5. What is called the physical basis of heredity?
   a) Gene *b)* RNA
   c) DNA *d)* Chromosome
6. Who discovered the chromosome in 1875?
   a) Mendel *b)* Linnaeus
   c) Karl Ereky *d)* Strasburger
7. What is the measure of the length of a chromosome?
   a) 0.2-2.0 μm *b)* 0.3-3.0 μm
   c) 3.0-30.00 μm *d)* 3.5-30.00 μm
8. Chromosome—
   i. carries gene
   ii. is the main heredity material
   iii. control the characteristics of organisms
   Which one is correct?
   a) i *b)* iii
   c) i and ii *d)* i, ii and iii
9. What is the main component of chromosome?
   a) DNA *b)* RNA
   c) Protein *d)* Chromatin
10. Which one is not the component of DNA?
    a) Nitrogen base
    b) Five carbon sugar
    c) Four carbon sugar
    d) Inorganic phosphate
11. How many components are there in a nucleotide?
    a) 2 *b)* 3
    c) 4 *d)* 5
12. When did Watson and Crick describe the double helical structure of DNA? In—
    a) 1933 *b)* 1943
    c) 1953 *d)* 1963
13. How many types of nitrogen base are found in a DNA molecule?
    a) 2 *b)* 3
    c) 4 *d)* 5
14. Which one is a correct bond for DNA?
    a) A≡T *b)* A=U
    c) G=T *d)* G≡C
15. Deoxyribonucleic acid—
    i. is lack of uracil
    ii. is a stable substance
    iii. is a structure of polynucleotide
    Which one is correct?
    a) ii *b)* iii
    c) ii and iii *d)* i, ii and iii
16. How many nucleotides are present in ten complete twists of a DNA molecule?
    a) 10 *b)* 50
    c) 100 *d)* 340
17. In the organism of which kingdom is circular DNA found?
    a) Fungi *b)* Monera
    c) Plantae *d)* Protista
18. What is the length between two adjacent nucleotides in a DNA?
    a) 2 A^0 *b)* 20 A^0
    c) 34 A^0 *d)* 3.4 A^0
19. What is the diameter of the twist of a DNA?
    a) 2 A^0 *b)* 20 A^0
    c) 34 A^0 *d)* 3.4 A^0

Observe the figures and answer the question nos. 20 and 21.



20. Which one is a nitrogen base?
    a) W *b)* X
    c) Y *d)* Z
21. The molecule of above figure—
    i. can replicate itself
    ii. is chemical carrier of heredity
    iii. is circular in unicellular prokaryotes
    Which one is correct?
    a) i *b)* iii
    c) i and iii *d)* i, ii and iii

22. Which one is absent in RNA?
a) A *b)* G
c) C *d)* T

23. In which does RNA serve itself as the heredity material?
a) TMV *b)* Yeast
c) *E. coli* *d)* T_2 Faz

24. Which nitrogen base is present in RNA instead of thymine?
a) Uracil *b)* Guanine
c) Adenine *d)* Cytosine

25. Which one is called the perfect master of heredity?
a) Gene *b)* RNA
c) DNA *d)* Chromosome

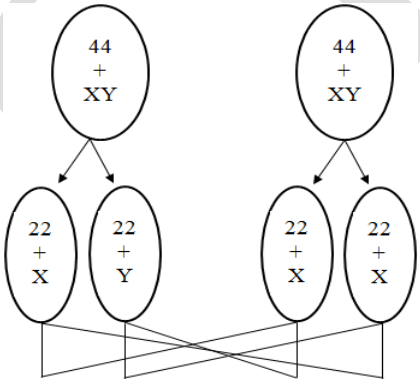
26. Where is synthesized protein first deposited in the case of eukaryotic cell? In—
a) Nucleus *b)* Ribosome
c) Golgi body *d)* Endoplasmic reticulum

27. Which one is the correct sequence for expressing characteristics?
a) Protein → RNA → Gene → Characteristics
b) RNA → DNA → Protein → Characteristics
c) DNA → Protein → RNA → Characteristics
d) DNA → RNA → Protein → Characteristics

28. When did Gregor Johan Mendel discover a valuable theory of genetics? In—
a) 1856 *b)* 1943
c) 1853 *d)* 1963

29. Which one is correct according to Mendel?
a) tt expresses tallness of pea
b) Tt expresses tallness of pea
c) Tt expresses shortness of pea
d) tT expresses shortness of pea

Observe the following figure and answer to the question nos. 30 and 31.



30. What will be the ratio of son and daughter of above figure?
a) 2:2 *b)* 3:1
c) 1:3 *d)* 2:1

31. 22+X or 22+Y indicates—
i. offspring
ii. haploid gamete
iii. reproductive mother cell
Which one is correct?
a) i *b)* ii
c) ii and iii *d)* i, ii and iii

32. The factor called by Mendel—
i. is the physical basis of heredity
ii. is the unit of controlling character
iii. is positioned throughout the chromosome
Which one is correct?
a) ii *b)* i and iii
c) ii and iii *d)* i , ii and iii

33. When did Watson and Crick successfully propose the replication process of DNA?
a) 1856 *b)* 1943
c) 1853 *d)* 1963

34. What is the name of the process by which a new DNA molecule is synthesized from an existing molecule of DNA?
a) Variation *b)* Conservative
c) Synthesizing *d)* Half-conservative

35. Adenine can combine with—
i. Uracil
ii. Thymine
iii. Cytosine
Which one is correct?
a) ii *b)* i and ii
c) ii and iii *d)* i , ii and iii

36. Which one is not required to perform the DNA Test?
a) Hair *b)* Tooth
c) Saliva *d)* Used clothes

37. By which enzyme is DNA cut?
a) Ligase *b)* Lipase
c) Amylase *d)* Restriction

38. Which one is not required for DNA test?
a) Lygase enzyme
b) Organic specimen
c) Polyacrylamide gel
d) Nitro cellulose paper

39. What is the full form of PCR?
a) Polymer Chain Reaction
b) Polymerase Chain Reaction
c) Polynucleotide Chain Reaction
d) Polynucleotide Combined Reaction

40. How many autosomes are there in the cell of human body?
a) 22 *b)* 23
c) 44 *d)* 46

41. How many sex chromosomes are there in the cell of human body?
a) One pair *b)* Two pairs
c) Four pairs *d)* Twenty two pairs

42. Autosomes play role in—
i. determining sex
ii. the formation of body
iii. embryonic development

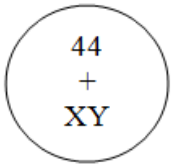
Which one is correct?
a) i and ii *b)* i and iii
c) ii and iii *d)* i, ii and iii

43. Who posses 'Y' chromosome along with 'X' chromosome?
a) Zerin *b)* Surya
c) Tamim *d)* Rahima

44. Who is responsible for giving birth to a female baby?
a) Aunt *b)* Sister
c) Uncle *d)* Mother

45. Through the process of meiosis—
i. XY is produced
ii. (22+Y) is produced
iii. (44+XX) is produced
Which one is correct?
a) i *b)* ii
c) i and ii *d)* ii and iii

Observe the flowing figure and answer the question nos. 46 and 47.



46. What does the figure indicate?
a) Gamete *b)* Auto some
c) Chromosome *d)* Sex chromosome

47. 'Y' of the above figure—
i. is rod shaped
ii. is shorter than 'X'
iii. indicates ♂ offspring
Which one is correct?
a) i *b)* ii
c) i and ii *d)* i, ii and iii

48. Which pair of chromosomes posses less number of genes?
a) YY *b)* XY
c) YX *d)* XX

49. Who may merely act as a carrier of gene of sex-linked disorder?
a) Aunt *b)* Uncle
c) Father *d)* Grand father

50. Which one is a sex-linked disorder?
a) Anemia *b)* Leukemia
c) Thalassemia *d)* Colour blindness

51. Who shows the symptom of sex-linked disorder directly?
a) Aunt *b)* Sister
c) Uncle *d)* Mother

52. If the father is colour blind and mother is carrier, what will be the ratio of offspring being healthy, colour blind and carrier?
a) 3 : 1 *b)* 1 : 2 : 1
c) 2 : 1 : 1 *d)* 1 : 1 : 1 : 1

53. If someone lacks a single pigment in his optical nerve, which colours would he not be able to differentiate?
a) Red and blue *b)* Red and violet
c) Red and green *d)* Red and yellow

54. Which one is the universal problem of colour blindness? Not to differentiate—
a) Red and blue *b)* Red and green
c) Red and yellow *d)* Blue and yellow

55. If someone lacks more than one pigment in his optical nerve, which colours would he not be able to differentiate besides red and green?
a) Red and blue *b)* Red and violet
c) Red and yellow *d)* Blue and yellow

56. What is the ratio of colour blind and normal man in the world?
a) 1 : 10 *b)* 9 : 10
c) 10 : 90 *d)* 10 : 100

57. Colour blindness occurs due to—
i. autosomal disorder
ii. sex-linked disorder
iii. hydroxy chlorouinine
Which one is correct?
a) i *b)* ii
c) i and ii *d)* ii and iii

58. Which one is an autosomal recessive disorder?
a) Anemia *b)* Leukemia
c) Thalassemia *d)* Colour blind

59. What is disintegrated due to thalassemia?
a) RBC *b)* WBC
c) Lymph *d)* Platelets

60. Every year how many babies are born with thalassemia?
a) 1200 *b)* 5000
c) 7000 *d)* 10000

61. How many types of thalassemia are there?
a) 2 *b)* 3
c) 4 *d)* 5

62. Child has more possibility of having thalassemia when—
i. only father is the carrier
ii. both father and mother are carriers
iii. marriage is held between maternal cousins
Which one is correct?
a) ii *b)* iii
c) i and ii *d)* ii and iii

63. In which region is α-Thalasssemia not prevalent?
a) China *b)* South Asia
c) Middle East *d)* Mediterranean region

64. If both father and mother are carriers, what will be the ratio of offsprings being thalassemia affected, carrier and healthy?
a) 3 : 1 *b)* 1 : 2 : 1
c) 2 : 1 : 1 *d)* 1 : 1 : 1 : 1

65. How many types of thalassemia are there on the basis of the inherited gene?
a) 2 *b)* 3
c) 4 *d)* 5
66. Which food is prohibited for thalassemia patient?
a) Fish *b)* Arum
c) Pulses *d)* Cabbage
67. From when does the patient suffering from major thalassemia face threats of life? From the age—
a) 20-30 *b)* 25-30
c) 30-35 *d)* 30-40

Read the following stem and answer question nos. 68 and 69:

Salim has been suffering from a genetic blood disease. The main symptom of this disease is anemia.

68. How many babies are born in Bangladesh in every year with Salim's problem?
a) 5000 *b)* 6000
c) 7000 *d)* 10000
69. The treatment of Salim's disease—
i. blood transfusion
ii. taking iron rich fruits
iii. not to take iron rich fruits
Which one is correct?
a) i and ii *b)* i and iii
c) ii and iii *d)* i, ii and iii
70. How many species of animals have been identified so far?
a) 13 billion *b)* 1.3 million
c) 13 million *d)* 1.5 million
71. How many species of plants have been identified so far?
a) 4000 *b)* 40,000
c) 4,00,000 *d)* 40,00,000
72. When did Xenophanes first discover fossils? In—
a) 300 BC *b)* 400 BC
c) 500 BC *d)* 600 BC
73. Who proved that the living organisms are not unchangeable?
a) Mendel *b)* Linnaeus
c) Xenophanes *d)* Herbert Spencer
74. When did Aristotle prove that in the living kingdom there are some species which are more developed in comparison to other species? In—
a) 300 BC *b)* 400 BC
c) 500 BC *d)* 600 BC
75. How long does the earth take to reach to the present state?
a) 4 billion years *b)* 5 billion years
c) 4.5 billion years *d)* 5.5 billion years
76. Where is life first originated? In—
a) Air *b)* Sea
c) Soil *d)* River
77. From which word does evolution come?
a) Evolun *b)* Evolari
c) Evolveri *d)* Evolvery
78. Who first used the word evolution?
a) Darwin *b)* Aristotle
c) Xenophanes *d)* Herbert Spencer
79. Evolution—
i. is a slow process
ii. is the change of gene alleles frequency
iii. is change of simple to complex organism
Which one is correct?
a) ii *b)* iii
c) i and ii *d)* i, ii and iii
80. Who provides modern definition of evolution?
a) Darwin *b)* Aristotle
c) Curtis-Burns *d)* Herbert Spencer
81. Present of what in the cell indicates that the life is originated from sea water?
a) Ion *b)* Water
c) Chlorine *d)* Mineral salt
82. At the beginning of the earth the atmospheric temperature increased due to—
i. lightening
ii. the effect of ultra violet rays
iii. frequent eruptions of volcanoes
Which one is correct?
a) i and ii *b)* i and iii
c) ii and iii *d)* i, ii and iii
83. What was absent in the air of the earth 2.6 billion years ago?
a) N_2 *b)* O_2
c) H_2S *d)* CO_2
84. From what have all organisms in the world been originated?
a) Protists *b)* Sponge
c) Amoeba *d)* Protozoans
85. Nucleoprotein is produced from the combination of—
i. ammonia
ii. amino acid
iii. nucleic acid
Which one is correct?
a) i and ii *b)* i and iii
c) ii and iii *d)* i, ii and iii
86. What was originated first?
a) Virus *b)* Bacteria
c) Protozoa *d)* Protovirus
87. After the formation of what in some unicellular organisms, was oxygen first produced in the earth?
a) Nucleus *b)* Golgi body
c) Chlorophyll *d)* Mitochondria

88. Where was Charles Darwin born? In—
a) Cheshire *b)* Somerset
c) Stamford *d)* Shrewsbury
89. When did Charles Darwin publish his famous book the 'Origin of Species by means of Natural Selection'? In—
a) 1808 *b)* 1837
c) 1859 *d)* 1882
90. Where is Galapagos Island situated? In—
a) Indian ocean *b)* Pacific ocean
c) Arctic ocean *d)* Atlantic ocean
91. Who provides the theory of evolution?
a) Darwin *b)* Malthus
c) Herbert Spencer *d)* Alfred Russell Wallace
92. Who mentioned natural selection as a cause of organic evolution?
a) Darwin *b)* Xenophanes
c) Herbert Spencer *d)* Alfred Russell Wallace
93. Who provides population theory?
a) Darwin *b)* Malthus
c) Herbert Spencer *d)* Alfred Russell Wallace
94. How many eggs does a female salmon fish lay in one breeding season?
a) 3 million *b)* 5 million
c) 10 million *d)* 30 million
95. The birth rate of which animal is very slow?
a) Whale *b)* Buffalo
c) Elephant *d)* Rhinoceros
96. In how many stages have the living organisms to struggle according to Darwin?
a) 2 stages *b)* 3 stages
c) 4 stages *d)* 5 stages
97. The koel of Mid and North America became extinct due to—
i. severe cold
ii. severe drought
iii. volcanic eruption
Which one is correct?
a) i *b)* ii
c) iii *d)* i, ii and iii
98. What is called the difference between the two specimens of the same species?
a) Isolation *b)* Variation
c) Hybridization *d)* Natural selection
99. In how many ways a new variety could be produced?
a) 2 ways *b)* 3 ways
c) 4 ways *d)* 5 ways
100. A new species emerges through—
i. variation
ii. evolution
iii. adaptation
Which one is correct?
a) i and ii *b)* i and iii
c) ii and iii *d)* i, ii and iii

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Creative Questions
Chapter Twelve
Heredity in organisms and evolution

Name : .....*Date:* .....
Class : X *Subject : Biology*

❖ **Creative Question: 01**

'X' is a component of heredity which has nitrogen base thymine. 'Y' is another component of heredity which is called 'Factor' by Mandel.

a) What is heredity? 1
b) Why is chromosome called the physical basis of heredity? 2
c) Describe the structure of X of the stem. 3
d) "Y is the controller of heredity."—Analyze with logic. 4

❖ **Creative Question: 02**

Fig: X

a) What is genetics? 1
b) What is meant by RNA? Explain. 2
c) Explain how a new one is synthesized from the figure: 'X'. 3
d) "The figure: 'X' has opened a new window of ensuring true justice."—Analyze the statement. 4

❖ **Creative Question: 03**

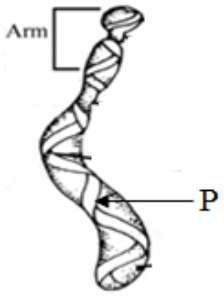

Fig: X

a) What is locus? 1
b) What do you mean by heredity materials? 2
c) Describe the chemical structure of 'p' in Fig: X. 3
d) Analyze the role of Fig: X in determination of human sex. 4

❖ **Creative Question: 04**

Limon is suffering from anemia after one year of his birth. He receives blood every two months as per the doctor's advice. But doctor advised not to give him any iron rich food.

a) What is sexual reproduction? 1
b) Differentiate between DNA and RNA. 2
c) Explain the cause of the disease of Limon. 3
d) Father and mother is responsible for the disease of Limon.—Analyze this comment. 4