

## Genetics & Evolution

01. The number of true breeding plant varieties selected by Mendel for his hybridization experiments in Garden pea is:  
(1) One. (2) Two. (3) Seven. **(4) Fourteen.**
02. Which of the following group of scientist first to identify the factor responsible for transformation of R-II form into S-III form in *Diplococcus pneumoniae* is DNA?  
(1) Hershey and Chase. **(2) Avery, MacLeod and McCarty.**  
(3) James Watson and Francis Crick. (4) Meselson and Stahl.
03. Which of the following theory explains continuity of life and not origin of life?  
(1) Spontaneous generation theory. **(2) Theory of Biogenesis.**  
(3) Theory of Chemical evolution. (4) Theory of Cosmozoa.
04. The significance of Mendel's dihybrid crosses is:  
(1) the appearance of new traits in F<sub>2</sub> plants due to independent assortment of genes.  
**(2) the appearance of new combinations in F<sub>2</sub> plants due to independent assortment of genes.**  
(3) the appearance of new traits in F<sub>2</sub> plants due to genetic recombination.  
(4) the appearance of new combinations in F<sub>2</sub> plants due to genetic recombination.
05. During the DNA replication, the complementary nucleotides picked as substrates are:  
(1) ribonucleoside monophosphate. (2) deoxyribonucleoside diphosphate.  
(3) deoxyribonucleoside monophosphate. **(4) deoxyribonucleoside triphosphate.**
06. The life was originated on earth about \_\_\_\_\_ billion years ago:  
(1) 20 (2) 4.5 **(3) 4** (4) 2
07. The number of alleles involved in controlling Red, Pink and White flower traits in the *Antirrhinum* plant species are:  
(1) One. **(2) Two.** (3) Three. (4) Four.
08. In a B-DNA molecule of 1,36,000 A<sup>o</sup> length, there is 20% cytosine. The number of adenine molecule in this DNA is:  
(1) 15000. (2) 30000. **(3) 24000.** (4) 1600.
09. The biogenetic law is based on:  
(1) Homologous structures. (2) Analogous structures.  
(3) Paleontological evidences. **(4) Embryological evidences.**
10. A woman married for the second time. Her first husband was of blood type 'A', and her child by that marriage was of type 'B'. Her second Husband is of type 'O' and their child is of type 'A'. Which among the following option matches with her blood group genotype?  
(1) I<sup>A</sup>I<sup>B</sup> (2) ii (3) I<sup>B</sup>i **(4) I<sup>A</sup>I<sup>B</sup>**
11. Which one of the following has split genes?  
(1) bacteria. (2) virus. (3) blue green algae. **(4) eukaryotes.**
12. The sum total of genes of all Individuals of Mendelian population (Inter breeding ones) is called:

- (1) Gene frequencies.    **(2) Gene pool.**    (3) Genetic drift.    (4) Gene flow.
13. **Statement A:** ABO-blood groups in humans are controlled by 3 different allosomal genes.  
**Statement B:** Type and presence or absence of specific sugar polymers present in plasma membrane of RBC is the basis for ABO blood groups.  
 (1) Both the statements are correct.    (2) Both the statements are incorrect.  
 (3) Statement A is correct and B is not correct.    **(4) Statement B is correct and A is not correct.**
14. The Okazaki fragments are short fragments of:  
 (1) continuous DNA synthesis.    (2) leading strand DNA.  
**(3) lagging strand DNA.**    (4) RNA primers.
15. In a population that is in Hardy-Weinberg equilibrium, the frequency of a recessive allele for a certain hereditary trait is 0.2. What per cent of individuals in the next generation would be expected to show the dominant trait?  
 (1) 8    (2) 64    **(3) 96**    (4) 32
16. How many different types of gametes can be formed by  $F_1$  progeny, resulting from the following cross  $AABBCC \times aabbcc$ ?  
 (1) 03    **(2) 08**    (3) 27    (4) 64
17. Wobble hypothesis establishes:  
 (1) peptide chain formation.    (2) initiation of peptide chain.  
 (3) termination of peptide chain.    **(4) economy in synthesis of t-RNA.**
18. Appearance of dark coloured peppered moths among the pale coloured ones as a result of industrial pollution is an example of:  
 (1) stabilizing selection.    (2) disruptive selection.  
**(3) directional selection.**    (4) gene migration.
19. Consider the following statement regarding linkage -  
 i. The linked genes are located on the same chromosomes.  
 ii. Freedom of assortment of linked genes is high.  
 iii. Linked genes have a lesser tendency to pass together to the next generation.  
 iv. Linked genes bring in new combinations through crossing over.  
 The options are:  
 (1) i and iii are correct.    **(2) i and iv are correct.**  
 (3) ii, iii and iv are correct.    (4) all are correct.
20. In Hershey and Chase experiment, the virus grew in a medium containing radioactive  $^{32}P$  resulted in radioactive:  
**(1) Viral DNA.**    (2) Viral proteins.  
 (3) Protein capsule of bacteriophage.    (4) Bacterial capsule.
21. The two key concepts of Darwin's theory of evolution are:  
 (1) Natural selection and Use and disuse of organs.  
 (2) Use and disuse of organs and Inheritance of acquired characters.  
**(3) Natural selection and Branching descent.**  
 (4) Branching descent and Mutations.
22. In a cross in *Drosophila*, the heterozygous fly with grey body ( $b^+$ ) and long wing ( $Vg^+$ ) with black body and vestigial wings, the progeny has the flies in the following ratio:  
 i. Grey Vestigial : 24    ii. Grey Long : 126  
 iii. Black Vestigial : 124    iv. Black Long: 26

What is the frequency of recombinants in the population?

- (1) 14.5                      (2) 17.5                      **(3) 16.7**                      (4) 15.8

23. Theoretically, how many gyres of DNA helix a nucleosome contains?

- (1) 2                              (2) 10                              **(3) 20**                              (4) 200

24. The ancestors of modern day frogs and salamanders:

- (1) Sphenodon.                      **(2) Coelocanth.**                      (3) Archaeopteryx.                      (4) Petromyzon.

25. Height and skin colour in human are classical examples for:

- (1) Multiple allelism.                      (2) Sex-linked traits.  
**(3) Polygenic inheritance.**                      (4) Pleiotropism.

26. The fore limbs of different groups of mammals like cheetah, man, bat and whale share similar pattern of bones such as humerus, radius, ulna, carpals, metacarpals and phalanges. This is indicative of:

- (1) convergent evolution.                      (2) parallel evolution.  
(3) stabilizing selection.                      **(4) divergent evolution.**

27. A polygenic trait is controlled by 3 genes A, B, C. In a cross AaBbCc x AaBbCc, the phenotypic ratio of the offspring was observed as 1 : 6 : x : 20 : x : 6 : 1. What is the possible value of x?

- (1) 3                              (2) 9                              **(3) 15**                              (4) 25

28. According to findings of HGP, no of genes present in Chromosome 1 and the Y –chromosome is:

- (1) Chromosome 1= 2968; Y –chromosome = 231.**                      (2) Chromosome 1= 2698; Y –chromosome = 225.  
(3) Chromosome 1= 3968; Y –chromosome = 221.                      (4) Chromosome 1= 2668; Y –chromosome = 545.

29. In Lac Operon of E. coli the chemical that attaches to repressor and changes the shape of operator binding site to prevent the repressor from attaching to operator is called:

- (1) oppressor                      (2) depressor                      (3) suppressor                      **(4) inducer**

30. Sickle cell anaemia is caused due to substitution of:

- (1) Valine at 6<sup>th</sup> position of alpha globin chain by glutamic acid.  
(2) Valine at 6<sup>th</sup> position of beta globin chain by glutamin.  
**(3) Glutamic acid at the 6<sup>th</sup> position of beta globin chain by valine.**  
(4) Glycine at the 6<sup>th</sup> position of alpha globin chain by glutamic acid.

31. Which one of the following is not a feature of VNTR?

- (1) Part of satellite DNA that forms small peaks during density gradient centrifugation.  
**(2) Constitute small portion of genome.**  
(3) Do not code for any proteins.  
(4) Called Minisatellite repeats.

32. The primitive man who used hides to protect their body and buried their dead is:

- (1) Dryopithecus.                      (2) Ramapithecus.  
(3) Handy man.                      **(4) Neanderthal man.**

33. Hypogonadism is seen in -

- i. Turner's syndromes.  
ii. Klinefelter's syndrome.  
iii. Thalassemia.  
iv. Down's syndrome.

- (1) i, ii and iii.      **(2) i and ii.**      (3) i, ii and iv.      (4) all of these.

34. The term survival of fittest was used for the first time by:

- (1) Hugo de Vries.      (2) Charles Darwin.      (3) T. R. Malthus.      **(4) Herbert**

**Spencer.**

35. The phenomenon of independent development of similar features in two unrelated groups of organisms because of similar environmental pressures in spite of not having a common ancestor is called:

- (1) Adaptive radiations.      **(2) Parallel evolution.**      (3) Atavism.      (4) Divergent evolution.

36. In eukaryotes the RNA polymerase II transcribes:

- (1) 28s rRNA, 18s rRNA and 5.8s RNA.      (2) tRNA, 5s RNA and snRNA.  
**(3) hnRNA.**      (4) mRNA.

37. Pick the correct statement regarding Phenylketonuria.

- (1) An autosomal dominant trait.  
(2) Conversion of Tyrosine into Phenyl alanine is affected.  
(3) It is due to increased reabsorption of Phenylpyruvic acid and its derivatives in kidneys.  
**(4) Increased concentration of Phenylpyruvic acid and its derivatives due to failure of phenyl alanine metabolism.**

38. Which one of the following is an example for analogous structures?

- (1) Wings of butter flies and birds.**  
(2) Wolf and Tasmanian wolf.  
(3) Vermiform appendix and Wisdom teeth.  
(4) Thorns of Bougainvillea and tendrils of Cucurbita.

39. The scientist who argued the possibility of triplet nature of genetic code is:

- (1) Severo Ochoa.      (2) Marshal Nirenberg.  
(3) Har Gobind Khorana.      **(4) George Gammow.**

40. In which chromosomal basis of sex determination the female organism has '+1' linkage group?

- (1) XY      (2) XO      **(3) ZW**      (4) XY and ZW

41. Which among the following formed the coal deposits?

- (1) Bryophytes.      (2) **Tree Ferns.**  
(3) Cycads and Conifers.      (4) Spore bearing plants.