

QB365 Question Bank Software Study Materials

Botany - Chromosomal Basis of Inheritance 50 Important 1 Marks Questions With Answers (Book Back and Creative)

12th Standard

Biology

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) An allohexaploidy contains _____.

- (a) Six different genomes (b) Six copies of three different genomes **(c) Two copies of three different genomes**
(d) Six copies of one genome

2) Match list I with list II

List I	list II
A. A pair of chromosomes extra with diploid	i) monosomy
B. One chromosome extra to the diploid	ii) tetrasomy
C. One chromosome loses from diploid	iii) trisomy
D. Two individual chromosomes lose from diploid	iv) double monosomy

(a)	(b)	(c)	(d)
ABCD	ABCD	AB CD	A BCD
i iiiii iv	ii iiiivi	iiiiii iv	iiii i iv

3) Which of the following sentences are correct?

- The offspring exhibit only parental combinations due to incomplete linkage
- The linked genes exhibit some crossing over in complete linkage
- The separation of two linked genes are possible in incomplete linkage
- Crossing over is absent in complete linkage

- (a) 1 and 2 (b) 2 and 3 **(c) 3 and 4** (d) 1 and 4

4) Due to incomplete linkage in maize, the ratio of parental and recombinants are _____.

- (a) 50:50 **(b) 7:1:1:7** (c) 96.4: 3.6 (d) 1:7:7:1

5) The point mutation sequence for transition, transition, transversion and transversion in DNA are _____.

- (a) A to T, T to A, C to G and G to C **(b) A to G, C to T, C to G and T to A** (c) C to G, A to G, T to A and G to A
(d) G to C, A to T, T to A and C to G

6) If haploid number in a cell is 18. The double monosomic and trisomic number will be _____.

- (a) 35 and 37 **(b) 34 and 37** (c) 37 and 35 (d) 17 and 19

7) Changing the codon AGC to AGA represents _____.

- (a) missense mutation** (b) nonsense mutation (c) frameshift mutation (d) deletion mutation

8) **Assertion (A):** Gamma rays are generally use to induce mutation in wheat varieties.

Reason (R): Because they carry lower energy to non-ionize electrons from atom

- (a) A and R are correct (b) A is correct. R is wrong **(c) A is wrong. R is correct** (d) A and R are wrong

- 9) The A and B genes are 10 cm apart on a chromosome. If an AB/ab heterozygote is testcrossed to ab/ab, how many of each progeny class would you expect out of 100 total progeny?
 (a) 25 AB, 25 ab, 25 Ab, 25 aB (b) 10 AB, 10 ab (c) 45 AB, 45 ab **(d) 45 AB, 45 ab, 5 Ab, 5aB**
- 10) How many map units separate two alleles A and B if the recombination frequency is 0.09?
 (a) 900 cM (b) 90 cM **(c) 9 cM** (d) 0.9 cM
- 11) Which is not a feature of the chromosomal theory of inheritance?
(a) Somatic cells of organisms are derived from zygote by repeated meiosis.
 (b) Chromosomes retain their structural uniqueness throughout the life of an organism.
 (c) Mendelian factors are located in chromosomes (d) Sutton and Boveri independently proposed the theory.
- 12) Number of chromosomes (2n) in Ophioglossum is _____
 (a) 1226 (b) 1622 **(c) 1262** (d) 2126
- 13) Identify the syntenic gene from the given genes sequence of a chromosome G-H-I-J-K-L-M-A-B
 (a) G and H (b) J, K and L **(c) G and B** (d) A and B
- 14) Incomplete linkage was reported by Hutchinson in _____
 (a) Drosophila **(b) Maize** (c) Neurospora (d) Lathyrus odoratus
- 15) During cross over, chiasma occurs between
 (a) Sister chromatids of non-homologous chromosomes (b) Non-sister chromatids of non-homologous chromosomes
(c) Non-sister chromatids of homologous chromosomes (d) Sister chromatids of homologous chromosomes
- 16) At which stage of meiosis, does the chromosomes undergo recombination process
 (a) Leptotene stage of prophase I (b) Zygotene stage of prophase I (c) Diplotene stage of prophase I
(d) Pachytene stage of prophase I
- 17) Recombination frequency (RF) is equal to
 (a) $\frac{\text{No. of offsprings}}{\text{No. of recombinants}} \times 100$ (b) $\frac{\text{No. of recombinants}}{\text{No. of parental strains}} \times 100$ **(c) $\frac{\text{No. of recombinants}}{\text{No. of offsprings}} \times 100$** (d) $\frac{\text{No. of offsprings}}{\text{No. of parental strains}} \times 100$
- 18) Mutation theory was proposed by _____
 (a) T. H. Morgan **(b) Hugo de Vries** (c) Alfred Sturtevant (d) Sutton and Boveri
- 19) Identify the mutant variety of castor.
 (a) Sharbathi Sonora variety **(b) Aruna variety** (c) Reimei variety (d) Erectiform variety
- 20) Transition type of gene mutation is caused when _____
(a) AC is replaced by GT (b) AG is replaced by TC (c) AC is replaced by TG (d) TC is replaced by AG
- 21) Sharbathi Sonara is a mutant wheat variety which is developed by irradiating the seeds with _____
 (a) Thermal neutrons **(b) Gamma radiation** (c) X-rays (d) UV radiations
- 22) Statement 1: Euploidy involves entire sets of chromosomes
 Statement 2: Aneuploidy involves individual chromosomes within a diploid net.
 (a) Statement 1 is correct and Statement 2 is incorrect (b) Statement 1 is incorrect and Statement 2 is correct
(c) Both the statements are correct (d) Both the statements are incorrect
- 23) Statement 1: Self-sterility in Nicotiana is controlled by multiple alleles.
 Statement 2: Multiple alleles are always responsible for the same character.

(a) Statement 1 is correct and Statement 2 is incorrect (b) Statement 1 is incorrect and Statement 2 is correct

(c) Both the statements are correct (d) Both the statements are incorrect

24) _____ is called as "Father of Indian Green Revolution".

(a) M.S. Swaminathan (b) P. Maheswari (c) Mendel (d) Nel Jayaraman

25) The chromosomal condition $2n - 2$ represents

(a) Monosomy **(b) Nullisomy** (c) Trisomy (d) Tetrasomy

26) A cross is made between a white eyed female Drosophila, with a red eyed male drosophila, what will the colour of eyes for their male and female offspring

(a) Both red eye (b) Both white eye **(c) Red eyed female and white eyed male**
(d) Red eyed male and white eyed female

27) The theory of recombination of linked gene due to crossing over chromosome was put forwarded by

(a) Mendel **(b) T.H. Morgan** (c) T. Boveri (d) W.S. Sutton

28) Percentage of recombination between A and B is 10% and A and C 18% anti B and C is 25%, then the arrangement of genes is

(a) ABC (b) ACB (c) BCA **(d) BAC**

29) Intimate pairing between two homologous chromosomes is initiated during which stage of prophase 1 of meiosis

(a) Zygotene (b) Leptotene (c) Pachytene (d) Diplotene

30) The concept of gene mapping was first developed by

(a) T.H. Morgan **(b) Alfred H Stutevant** (c) Robin Holliday (d) Hutchinson

31) In order to calculate map distance of genes on a chromosome, this has to be considered

(a) Number of mutant genes **(b) Cross over percentage** (c) Recombination frequency of each gene locus
(d) Non cross over percentage

32) Cyanodan dactylon is a

(a) Manmade auto triploid **(b) Natural auto triploid** (c) Auto tetraploid (d) Pentaploid

33) Find out the incorrect statements

- (1) Change in amino acid encoded in silent mutation
- (2) No change in amino acid encoded in missense mutation
- (3) Non sense mutation creates translational termination codon
- (4) Frame shift mutation - shifts triplet reading of codons out of correct phase

(a) Both (1) and (2) (b) Both (2) and (3) (c) Both (3) and (4) (d) (2) only

34) Match the column I and column II with regard to the types of mutations classified and their major features

column I	column II
A Gain of function	1. increases normal function
B. Loss of function	2. Reduces normal function
C. Hyper morphic	3. Eliminate normal function
D. Hypo morphic	4. Expressed at incorrect time

(a) A-3 B-4 C-2 D-1 **(b) A-4 B-3 C-1 D-2** (c) A-2 B-1 C-3 D-4 (d) A-1 B-2 C-4 D-3

35) Match the following and find the correct answer:

i) Pentasomy	A) $- 2n - 2$
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ii) Double monosomy	B) - 2n + 1
iii) Nullisomy	C) -2n - 1 - 1
iv) Trisomy	D) - 2n + 3

- (a) (i)-C, (ii)-D, (iii)-B, (iv)-A (b) (i)-B, (ii)-C, (iii)-D, (iv)-A (c) (i)-C, (ii)-B, (iii)-A, (iv)-D **(d) (i)-D, (ii)-C, (iii)-A, (iv)-B**
- 36) When red eyed female drosophila is crossed with white-eyed male, the F1 offsprings would be
 (a) Females are with white eye and males are with red eye (b) Males are with red eye and females are with yellow eye
(c) Both males and females are with red eye (d) Both males and females are with white eyes
- 37) How can we reverse the sterility of F1 hybrid?
 (a) Genetic Engineering (b) Protoplasmic fusion (c) Induced Mutation **(d) Induce chromosomal abberation**
- 38) If haploid number in a cell is 23. the double monosomic and pentasomy number will be
(a) 44 and 49 (b) 17 and 34 (c) 47 and 46 (d) 45 and 48
- 39) If there are 999 bases in an RNA that codes for a protein with 333 amino acid and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?
 (a) 1 (b) 11 (c) 33 **(d) 333**
- 40) In a mutational event when adenine is replaced by guanine, it is the case of
 (a) Frameshift mutatin (b) Transcription **(c) Transition** (d) Transversion
- 41) The mechanism that causes a gene to move from one linkage group to another is called
(a) Translocation (b) Crossing over (c) Inversion (d) Duplication
- 42) Frameshift mutation occurs when
 (a) Base is substituted **(b) base is deleted or added** (c) Anticodons are absent (d) None of these
- 43) The distance between two genes in a chromosome is measured in cross-over units which represent
 (a) Ratio of crossing over between them **(b) Percentage of crossing over between them**
 (c) Number of crossing over between them (d) None of these
- 44) After a mutation at a genetic locus of the character of an organism changes due to the change in
 (a) DNA replication (b) Protein synthesis pattern (c) RNA transcription pattern **(d) Protein structure**
- 45) Which one of the following is a wrong statement regarding mutations?
 (a) UV and Gamma rays are mutagens **(b) Change in a single base pair of DNA does not cause mutation**
 (c) Deletion and insertion of base pairs cause frame shift mutations.
 (d) Cancer cells commonly show chromosomal aberrations.
- 46) Haploids are more suitable for mutation studies than the diploids. This is because
(a) All mutations, whether dominant or recessive are expressed in haploids
 (b) Haploids are reproductively more stable than diploids (c) Mutagens penetrate in haploids more effectively than diploids
 (d) Haploids are more abundant in nature than diploids
- 47) Crossing over that results in genetic recombination in higher organisms occurs between
(a) Non-sister chromatids of a bivalent (b) Two daughter nuclei (c) Two different bivalents
 (d) Sister chromatids of bivalents
- 48) The reason for the selection of fruit fly T.H. Morgan are
 (a) a single mating could produce a large number of progeny flies

(b) there was a clear cut differentiation of sexes easily distinguishable

(c) many types of hereditary variations that can be seen with low Power microscope

(a) a & b correct (b) a & c correct (c) b & c correct **(d) a, b, & c correct**

49) Change in a single base pair of DNA is called

(a) Frame shift mutations **(b) Point mutations** (c) Chromosome aberration (d) Gene aberration

50) The term allele was coined by

(a) Mendel **(b) Bateson** (c) Watson (d) Morgan