BIOLOGY

BOOKS - MODERN PUBLISHERS BIOLOGY (HINGLISH)

PRINCIPLES OF INHERITANCE AND VARIATION

Practice Problems Genes And Chromosomes

1. Differentiate between prokaryotic and eukaryotic chromosome.

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2. The map distance between genes A and B is 3 units, between B and C is 10 units and between C and A is 7 units, what is the order of genes on linkage map?

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3. What are barr bodies?Discuss its significance.

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4. What is aneuploidy?Give example .

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5. What are forward and reverse mutations?

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6. Differentiate between autosomes and allosomes?

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7. Differentiate between linkage and crossing over.

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Practice Problems

1. A pea plant with purple flowers was crossed with white flowers producing, 50 plants with only purple flowers. On selfing, the plants produced 470 plants with purple flowers and 160 with white flowers. Explain the genetic mechanism accounting for the above results.

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2. In human beings blue eyes colour is recessive to brown eye .A brown man has a

blue eyed mother

(a)What is the genotype of his mother?

(b)What are possible genotype of his father?

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3. The gene for yellow seed coat in peas is dominant to its allele,green .What offspring phenotype ratio would be expected from a cross between a pea plant known to be heterozygous for coat colour?

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4. In dogs barking trait is dominant over the silent trait and erect ears are dominant over drooping ears

(a)What is the expected phenotypic ratio of the offsprong when dogs heterozygous for both the traits are crossed ?

(b)What would be phenotypic ratio if dogs heterozygous for the traits are crossed with dogs homozygous recessive for both traits?

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5. A pedigree given below started with a dark haired lady marrying a red haired gentleman.Indicate the genotypes of all the members and whether red hair is due to the dominant or recessiv allele.

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6. In tomato plants,the gene for purple stem(P) Is dominant for green stem (p)and the gene for red fruit (R) is dominant to its allele

for yellow fruit (r).If two tomato plants heterozygous for both the traits are crossed ,state what proportion of the offspring are expected to have :

(a)purple stems and yellow fruits. (b)Green stems and red fruits (c)Purple stems and red fruits.

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7. Differentiate between codominance and dominance.

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Ncert File Ncert Exercise Questions

1. Mention the advantages of selecting pea plant for experiment by Mendel.

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2. Differentiate between the following:

(a) Dominance and Recessive

(b) Homozygous and Heterozygous

(c) Monohybrid and Dihybrid.

3. A diploid organism is heterozygous for 4 loci, how many types of gametes can be produced ?

4. Explain the Law of Dominance using a monohybrid cross.

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5. Define and design a test – cross?

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6. Using a Punnett square, work out the distribution of phenotypic features in the first

filial generation after a cross between a homozygous female and a heterozygous male for a single locus.

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7. When a cross in made between tall plants with yellow seeds (TtYy) and tall plant with green seed (Ttyy), what proportions of phenotype in the offspring could be expected to be

(a) Tall and green.

(b) Dwarf and green.

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8. Two heterozygous parents are crossed. If the two loci are linked what would be the distribution of phenotypic features in F_1 generation for a dihybrid cross?

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9. Briefly mention the contribution of T.H. Morgan in genetics.

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10. What is pedigree analysis? Suggest how such an analysis, can be useful.

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11. How is sex determined in human beings?

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12. A child has blood group O. If the father has blood group A and mother blood group B, work out the genotypes of the parents and the possible genotypes of the other offsprings.

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13. Explain the following terms with example

(a) Co-dominance

(b) Incomplete dominance

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14. What is point mutation? Give one example.

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15. Who had proposed the chromosomal theory of inheritance?

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16. Mention any two autosomal genetic disorders with their symptoms

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Ncert File Ncert Exampler Problem A Multiple Choice Questions

1. All gens located on the same chromosome

A. Form different groups depending upon their relative distance

B. Form one linkage group

C. Will not form ant linkage group

D. Form interactive groups that effect the phenotype

Answer: B

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2. Conditions of a karyotype $2n \pm 1$ and $2n \pm 2$ are called

A. Aneuploidy

B. Polyploidy

C. Allopolyploidy

D. Monosomy

Answer: A

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3. Distance between the genes and percentage of recombination shows

A. A direct relationship

B. An inverse relationship

C. No relationship

D.

Answer: B

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4. If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is

A. Autosomal dominant

B. Autosomal recessive

C. Sex-linked dominant

D. Sex-linked recessive

Answer: D

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5. In sickle cell anaemia glutamic acid is replaced by valine Which one of the following triplets codes for valine ?

A. G G G

B. A A G

C. G A A

D. G U G

Answer: D

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6. Person having genotype $I^A I^B$ would show the blood group as AB. Thus is because of

A. Pleotropy

B. Co-dominance

C. Segregation

D. Incomplete dominance

Answer: B

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7. ZZ/ZW type of sex determination is seen in

A. Platypus

B. Snails

C. Cockroach

D. Peacock

Answer: D

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8. A cross between two tall plants reseulted in offspring having few dwarf plants. What would be the gentypes of both the parents ?

A. TT and Tt

B. Tt and Tt

C. TT and TT

D. Tt and tt

Answer: B

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9. In a dihybrid crossm if you get $9:3:3:1$ ratio it denotes that

A. The alleles of two genes are interacting with each other

B. It is a multigenic inheritance

C. It is a case of multiple allelism

D. The alleles of two genes are segregating independently.

Answer: D

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10. Which of the following will not result in variations among siblings ?

A. Independent assortment of genes

B. Crossing over

C. Linkage

D. Mutation

Answer: C

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11. Mendel's law of independent assortment holds good for genes situated on the

A. Non-homologous chromosomes

B. Homologous chromosomes

C. Extra nuclear genetic element

D. Same chromosome

Answer: A

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12. Occasionally, a single gene may express more than one effect. The phenomenon is called

A. Multiple allelism

B. Mosaicism

C. Pleiotropy

D. Polygeny

Answer: C

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13. In a certain taxon of insects some have 17 chromosomes and the others have 18 chromosomes. The 17 and 18 chromosome-bearing organisms are

A. Males and females ,respectively

B. Females and males,respectively

C. All males

D. All females

Answer: A

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14. The inheritance pattern of a gene over generations amoung human is studied by the pedigree analysis. Character studied in the pedigree analysis is equivalent to

A. Quantitative trait

B. Mendelian trait

C. Polygenic trait

D. Maternal trait

Answer: B

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15. It is said that Mendel proposed that the factor controlling any character is discrete and independent. This proposition was based on the

A. Result of F_3 generation of a cross.

B. Observatiuons that the offspring of a cross made between the plants having

two contrasting chracters shows only one character without any blending

C. Self pollination of F_1 ofsprings

D. Cross pollination of parental generations

Answer: B

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16. Two genes 'A' and 'B' are linked. In a dihybrid cross involving these two genes, the F_1 hetrozygote is crossed with homozygous recessive parental type (aa bb). What would be the ratio of offspring in the next generation?

A. $1:1:1:1$

B. $9:3:3:1$

C. $3:1$

D. $1:1$

Answer: A

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17. In the F_2 generation a Mendelian dihybrid cross the number of phenotypes and genotypes are

A. Phenotypes-4,genotypes-16

B. Phenotypes-9,genotypes-4

C. Phenotypes-4,genotypes-8

D. Phenotypes-4,henotypes-9

Answer: D

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18. Mother and father of a person with 'O' blood group have 'A' and 'B' blood group respectively. What would be the genotype of both mother and father ?

A. Mother is homozygous for 'A' blood group and father is haterzygous for'B'

B. Both mother and father are haterozygous for 'A' blood goup and

father is homozygous for 'B'

C. Both mother and father are heterozygous for 'A' and 'B' blood group,respectively

D. Both mother and father are homozygous for 'A' and 'B' blood group ,respectively.

Answer: C

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Ncert File Ncert Exampler Problem Ncert B Very Short Answer Type Questions

1. What is the cross between the progeny of F_1 and the homozygous recessive parent called? How is it useful?

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2. Do you think Mendel's Laws of inheritance would have been different in the characters

that he chose were located on the same chromosome.

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3. Enlist the steps of controlled cross-pollination. Would esasculation be needed in a cucurbit plant? Give reasons for your answer.

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4. A person has to perform crosses for the purpose of studying inheritance of a few traits/characters. What should be the criteria for selecting the organisms?

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5. The pedigree chart given below shows a particular trait which is absent in parents but present in next generation irrespective of sexes.Draw your conclusion on the basis of

following pedigree :

View Text Solution

6. In order to obtain the F_1-generation Mendel pollinated a pure-breeding tall plant with a pure-breeding dwarf plant. But for getting the F_2-generatin, he simply self-pollinated the tall F_1 plants. Why?

Watch Video Solution

7. Genes contain the information that is required to express a particular trait.' Explain.

Watch Video Solution

8. How are alleles of particular gane differ feom each other? Explain its significance.

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9. In a monohybrid cross of plants with red and white flowered plants. Mendel got only red flowered plants. On self-pollinating these F_1 plants got both red and white flowered plants in 3:1 ratio. Explain the basis of using RR and rr symbols to represnt the genotype of plants of parental generation.

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10. For the experssion of traits genes provide only the potentiality and the enivornment provides the opportunity. Comment on the veracity of the statement.

 Watch Video Solution

11. A, B, D are three independently assorting genes with their recessive aleles a,b,d respectively. A cross was made between individuals of Aa bb DD genotype with aa bb

dd. Find out the type of genotypes of the offspring produced.

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12. In our society a woman is often blamed for not bearing male child. Do you thing it is right? Justify.

 Watch Video Solution

13. Discuss the genetic basis of wrinkled phentype of pea seed.

14. Even if a character shows multiple allelism, an individual will only have two alleles for that character. Why?

15. How does a mutagen induce mutation? Explain with example.

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Ncert File Ncert Exampler Problem Ncert C Short Answer Type Questions

1. In a Mendelian monohybrid cross, the F_2-generation shows identcal genotypic and phenotypic ratios. What does it tell us about

the nature of alleles involved? Justify your answer.

Watch Video Solution

2. Can a child have blood group 'O' if his parents have blood group 'A' and 'B' Explain.

Watch Video Solution

3. What is Down's syndrome? Give its symotoms and cause. Why is it that the

chances of having a child with Down's syndrome incrreases if the age of the mother exceeds forth years ?

Watch Video Solution

4. How was it concluded that genes are located on chromosomes?

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5. A plant with red flowers was crossed with another plant with yellow flowers. If F1 showed all flowers orange in colour, explain the inheritance.

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6. What are the characteristic features of a trur-breeding line?

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7. In peas, tellenss is dominate over dqarfness, and red colour of flowers is dominant over the white coolour. When a tall plant bearing red flowers was pollinated with a dwarf plant bearing white flowers, the different phenotypic groups were obtained in the progeny in numbers mentioned against them

Tall, Red = 138

Tall, White = 132

Dwarf, Red = 136

Dwarf, White = 128

Mention the genotypes of the two parents and of the four offspring types.

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8. Why is the frequency of red-green colourblindness is many times higher in males than that in the females?

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9. If a father and son are both defective in red-greenn colour vision, is it likely that the son inherited the trait from his father? Comment.

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10. Discuss why Drosophila has been used extensively for genetical studies?

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11. How do genes and chromosomes share similarity from the point of view of genetical studies?

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12. What is recombination? Discuss the applications of recombination from the point of view of genetic engineering.

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13. With the help of an example differntiate between incomplete dominance and co-dominance.

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14. It is said, that the harmful alleles get eliminated from population over a period of time, yet sickle-cell anaemia is persisting in human population. Why?

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Ncert File Ncert Exampler Problem Ncert D Long Answer Type Questions

1. In a plant tallenss is dominant over dwarfness and red flower is dominant over white. Starting with the parents work out a dihybrid cross. What is standard dihybrid ratio? Do you think the values would deviate if the two genes in question are interacting wiht each other?

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2. (a) In humans, males are heterogametic and frmales are homogametic, Explain. Are there any examples where males are homogametic and females heterogametic?

(b) Also describe as to, who determines the sex of an unborn child? Mention whether temperature has a role in sex determination.

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3. A normal visioned woman, whose father is colour bline, marries a normal visioned man.

What would be probability of her sons and daughters to be colour blind. ? Explain with the help of a pedigree chart.

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4. Discuss in detail the contributions of Morgan and Sturvant in the area of genetics.

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5. Define aneuploidy. How is it different form polyploidy? Describe the individuals having following chromosomal abnormalities.

(a) Trisomy of 21st Chromosome

(b) XXY

(c) XO

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Higher Order Thinking Skills Brain Twisting Very Short Answer Questions

1. Who was the proponent of the theory of inheritance of acquired characters?

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2. What do you understand by terms allele and genotype?

Watch Video Solution

3. What are homologous chromosomes?

Watch Video Solution

4. What are autosomes?

Watch Video Solution

5. Who discovered the chromosomes?

Watch Video Solution

6. Name the plant in which chromosome number is maximum.

 Watch Video Solution

7. AaBb was crossed with aabb.What be the phenotypic ratio of progeny? Mention cross.

 Watch Video Solution

8. The gene I that controls the ABO blood grouping in human beings has three alleles IA. IB and i

(a) How many different genotypes are Likely to be present in human population?

(b) Also, how many phenotypes are possibly present?

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Higher Order Thinking Skills Brain Twisting Short Answer Questions

1. How many genes are responsible for?

(i)ABO system of blood group (ii)Skin colour in human

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2. Write pairs of contrasting characters of :

(i)Position of flowers (ii) Colour of unripe pod

(iii) Shape of ripe pod and colour of cotyledons, that were selected in pea by Mendel.

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3. Differentiate between epistasis and dominance.

Watch Video Solution

4. A normal man marries a woman who is carrier of colour blindness.What will be the phenotype of the children born to them? Depict the phenotype through a cross.

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5. Differentiate between a test cross and a reciprocal cross.

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Higher Order Thinking Skills Brain Twisting Short Answer Questions

1. In an experiment of sweet pea,a cross was made between two plants ,one having purple

flowers one having white. In F_1 all had purple flowers and in F_2 it was modified Mendelian ratio:

(i)What ratio do you expect in F_2? (ii)What is this phenomenon called? (iii)What are such genes called?

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2. (a)How does a haemophilic patient suffer?

(b)A haemophilic son is born to a normal couple,Explain the mechanism of this

inheritance.What is the probability of a haemophilic daughter being born to this couple?

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3. (a)How many alleles are involved in the inheritance of blood group in humans ?

(b)There is a boy with blood group A,whose mother has blood B.Give the possible genotype (s) and phenotype of the father.

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4. A woman with blood O married a man with AB group .Show the possible blood groups of progeny.List the alleles involved in this inheritance.

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5. Why Mendal selected pea plant for his experiments?

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Higher Order Thinking Skills Brain Twisting Long Answer Questions

1. In garden pea smooth seeded (S) character is dominant over wrinkled seeded(S) character and red flower (R) over white

(a)Ssrr $\times$ SsRr (b)SsRr $\times$ Ssrr (C)SsRr $\times$ ssrr (d)SSRR $\times$ SSRR (e) SsRr $\times$ SsRr .

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2. Explain the basis of sickle cell anaemia with the help of genotype outline.

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3. (a)What offspring would be expected from mating a roan cow with a roan bull, and a roan with a white?

(b)Give an example of genotypes such that two left handed parents would produce only right handed children .Only left handed both.

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4. A man with AB blood group has married a woman with O group.Show the possible genotypes and phenotypes of the progeny.

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5. Study the following carefully and explain why mutation (A) did not cuase any sickle cell anemia inspite of change in the molecular structure of the gene which codes for

haemoglobin ,when as a similar mutation (B)did. (The question is based on properties of the genetic code.c=codon,a=amino acid ,Hb= Haemoglobin)

Amino acids in Hb:$a_1 - a_2 - a_3 - a_4 - a_5$-Glutamic acid-Glutamic acid-$a - (8)$.....

(Normal Haemoglobin)

Mutation (A):

$C_1 - C_2 - C_3 - C_4 - C_5 - G\forall - G\forall - C_8$

.....

$a_1 - a_2 - a_3 - a_4 - a_5$-Glutamic acid-Glutamic acid-a_8.....

(Normal haemoglobin)

Mutation (B): $C_1 - C_2 - C_3 - C_4 - C_5$-GUG-GAA-$C_8$.....

$a_1 - a_2 - a_3 - a_4 - a_5$-valine-Glutamic acid-$a_8$.....

(Sickle cell Haemoglobin)

Watch Video Solution

6. (a) In humans, males are heterogametic and frmales are homogametic, Explain. Are there any examples where males are homogametic and females heterogametic?

(b) Also describe as to, who determines the sex of an unborn child? Mention whether temperature has a role in sex determination.

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Memory Test A Say True Or False

1. When the inheritance of a character is determined by many genes witht the same but cumulative phenomenon,effect is called quantitative inheritance.

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2. Carotenoid pigments determine the colour of skin in man.

Watch Video Solution

3. Environmental conditions affect the genotypic expression of polygenes.

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4. The tall character in sweet pea is determined by single gene pair (monogenic) as well as polygenic inheritance.

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5. In dihybrid cross,the phenotypic ratio of individuals in F_2 generation is $1:1:1:1$.

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6. Any gene that produces an effect in the heterozygous conditon is called dominant.

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7. In a monohybrid cross,test cross gives the exprected ratio of 3:1.

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8. Genes have similar phenotypic effect when present separately but interact to produce new phenotype when present together are called epistatic gene.

9. Bald head is due to use of wrong type of hair oil.

10. Sexually reproducing organism contribute in their offspring

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11. Coat colour is rabbit is an example of epistatic genes.

 Watch Video Solution

12. Human blood groups are determined by multiplic gene.

Watch Video Solution

13. A cross between an F_1 individual and dominant parent is called list cross.

Watch Video Solution

14. Monogenic inheritance deals with quantitative traits.

15. Mendel showed that units of heredity,the factors or genes are stable and particulate.

16. Chromosomes are best seen in telophase of cell division.

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17. In Ophioglossum somatic chromosome number in 1262.

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18. Morgan et.al were able to construct chromosome maps showing the relative location of many genes.

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19. PTC tasting and tongue rolling genes are present on the same chromosome.

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20. Haploid plants are usually fertile.

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21. Human genetic at metaphase may be karyotyped.

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Memory Test B Complete The Missing Links

1. Crossing over occurs in _____ stage of prophase - I of _____ .

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2. A chromosome having more than two chromatids is called as.....

Watch Video Solution

3. Jacob and Wollman named hereditary particles as.....which can exist in the cell as extra chromosomal elements.

View Text Solution

4. Linkage and crossing over are.....related.

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5. More the .....between two genes,the more ate the chances of .....

Watch Video Solution

6. Three examples of chemical mutagens are.....,.....and .....

Watch Video Solution

7. The inborn errors of metabolism are gene controlled and are inherited in Mendelian fashion was pointed by.....

Watch Video Solution

8. When there are more than two sets of genomes in a cell,the cell is said to be.....

Watch Video Solution

9. Crossing over occurs at.....stranded stage.

10. Human females are homogametic and males are.....

11. Mutant Drosophilla with white eyes was found by.....

Watch Video Solution

12. Transmission of a trait from father to daughter then to gradson is called.....

Watch Video Solution

13. Morgan received the nobel prize in .....for his pioneering work in geneties.

Watch Video Solution

14. When a particular chromosome rejoins in reverse orientation ,mutation work in geneties.

View Text Solution

15. When a particle chromosome is present in three copies,the cell is a.....

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16. A pair of genes may be identified as a linked if their recombination frequency is lower than expect value of.....

Watch Video Solution

17. Extra nuclear genes are usually present in mitochondria and.....

Watch Video Solution

18. Gene mutations alter the information conveyed by a.....

Watch Video Solution

19. A,B,O blood grouping in human beings is based on.....

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Memory Test C Choose The Correct Alternative

1. The Tt plant is homozygous/heterozygous for controlling one character (height).

Watch Video Solution

2. In case of co-dominance/incomplete dominance $1F_1$ generation resembles both parents.

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3. The two/four alleles of a gene pair are located on homologous sites on homologous chromosomes.

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4. Grasshopper is an example of XO/XY type of sex determination.

Watch Video Solution

5. Sickle cell anaemia is sec chromosome/autosome linked recessive trait.

Watch Video Solution

6. Down's syndrome is a genetic disorder which takes place in presence of an additional

copy of chromosome no. 19/21 (trisomy).

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Revision Exercises Multiple Choice Questions

1. A woman with normal vision,but whose father was colour blind,marries a colour blind man.Suppose that the fourth child of this couple was a boy .This boy:

A. Must have normal colour vision

B. Will be partially colour-blind since is heterozygous for the colour-blind mutant allele

C. Must be colour-blind

D. May be colour-blind or may be of normal vision.

Answer: D

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2. Haemophilia is more commonly seen in human males than in human females because

A. This disease is due to an X-linked recessive mutation

B. A greater proportion of girls die in infancy

C. This disease is due to X-linked recessive mutation

D. This disease is due to Y-linked recessive mutation

Answer: C

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3. A woman with 47 chromosomes due to three copies of chromosome 21 is characterized by

A. Down's syndrome

B. Triploidy

C. Tuner's syndrome

D. Super femaleness

Answer: A

4. Barr body in mammals represent

A. All heterochromatin in female cells

B. All heterochromatin in and female cells

C. The Y chromosome in the somatic cells of male

D. One of the two X-chromosomes in somatic cells of female

Answer: D

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5. A dwarf pea plant was treated with gibberellic acid. It grows as a pure tall pea plant. If the treated plant is crossed with a

pure tall plant, the phenotypic ratio of F_1 is likely to:

A. All dwarf plants

B. 50% talland 50% dwarf plants.

C. 75% tall and 25 % dwarf plants

D. 100% tall plants.

Answer: D

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6. Which of the following statements are true for complementary genes?

(a)Both the genes interact to produce complementary new trait

(b) Pair of non-allelic genes

(C)The F_2 ratio is generally 9:7

(d)The F_2 ratio is generally 9:3:4

A. (a),(b) and (C) are true

B. (a) and (b) are true

C. (b) and (c)are true

D. (C)and (d)are true

Answer: A

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7. Genetic counsellors can identify heterozygous individuals by

A. Height of individuals

B. Colour of individuals

C. Screening procedures

D. All of the above

Answer: C

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8. Haemophilia is a:

A. Deficiency disorder

B. Y-linked disorder

C. X-linked disorder

D. Autosomal sex disorder

Answer: C

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9. A marriage between normal visoned man and colourblind woman will produce which of the following types of offsprings

A. Normal sons and carrier daughters

B. Colour -blind sons and carrier daughters

C. Colour-blind sons and 50% carrier daughters

D. 50% colour-blind sons and 50% carrier daughters

Answer: B

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10. Rr rr progeny:Red (dominant)flowered heterozygous crossed with white flower:

A. 350 $\rightarrow$ red:350 $\rightarrow$ white

B. 450 $\rightarrow$ red: 250 $\rightarrow$ white

C. 380 $\rightarrow$ red: 250 $\rightarrow$ white

D. None of the above

Answer: A

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11. Linkage group in E.coli is/are:

A. 4

B. 2

C. 1

D. 5

Answer: C

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12. Turner syndrome is

A. XO

B. XXY

C. XXX

D. XYY

Answer: A

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13. A tall pea plant was grown in nutrient deficient soil and remained dwarf. When it is crossed with dwarf plant then:

A. All hybrid plants are dwarf

B. All hybrid plants are tall

C. 50% tall and 50% of dwarf

D. 75 % tall and 25% dwarf

Answer: B

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14. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder

A. 0.5

B. 0.25

C. 1

D. 0.75

Answer: A

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15. grain clour in wheat isdetermined by three pairs if polygenes. Following the cross AABBCC (dark colour) $\times$ aabbcc (light colour), in F_2 generation what proportion of the progeny likely to resemble either parent

A. Half

B. Less than 5 per cent

C. One third

D. None of the above

Answer: B

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16. Complete linkage is observed in:

A. Male Drosophilla sp.

B. Female Drosophilla sp.

C. Female silkworm

D. None of these

Answer: B

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17. Which one of the following conditions in humans is correctly matched with its chromosomal abnormality/linkage?

A. Erythroblastosis foetalis-X-linked

B. Down's syndrome-44 aurosomes+Xo

C. Kinefelter's syndrome-44 autosome+XXY

D. Colour blindness-Y-linked

Answer: C

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18. Haploids are more suitable for mutation studies than the diploids. This is because

A. Haploids are more abundant in nature than diploids

B. All mutations,whether dominant or recessive are expressed in haploids

C. Haploids are reproductively more stable than diploids

D. Mutagens penetrate in haploids more effectively than is diploids

Answer: B

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19. Mutations that devoelop suddnely in nature are

A. Chromosomal mutations

B. Induced mutations

C. Gene mutations

D. Spontaneous mutations

Answer: D

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Revision Exercises Very Short Answer Type Questions A Questions From State Board Examinations

1. Name the two kinds of linkage.

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2. Can you recall meiosis and indicate at what stage a recombinant DNA is made?

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3. What is allelomorphic pair?

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4. What is allele?

Watch Video Solution

5. Mention how does DNA polymorphism arise in a population.

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6. Define point mutation

Watch Video Solution

7. What is allele?

Watch Video Solution

8. What are multiple allelic genes?

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9. Trisomy of chromosome 21 causes:

A. Klinefelter's syndrome

B. Tuner's syndrome

C. Sickle cell anaemia

D. Down's syndrome

Answer: A

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10. XO monosomy in female causes:

A. Klinefelter's syndrome

B. Tuner's syndrome

C. Sickle cell anaemia

D. Down's syndrome

Answer: b

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11. Write one difference between Tuner's syndrome and Down's syndrome.

Watch Video Solution

12. Person having genotype $I^A I^B$ would show the blood group as AB. Thus is because of

A. Pleiiotropy

B. Co-dominance

C. Segragation

D. Incomplete dominance

Answer: B

Watch Video Solution

13. Genetics' term was proposed by:

A. Mendel

B. Bateson

C. Morgan

D. Johanssen

Answer: B

14. Which of the followings is not a Mendelian disorder?

Colourblindness ,Down's syndrome,Haemophilla,Thalassemia.

15. If the offsprings have the blood group O and A,the genotype of parents would be:

A. $I^A I^A$ and I^Ai

B. I^A I and ii

C. $I^A I^A$ and $I^A I^A$

D. $I^A I^A$ and I^B i

Answer: B

Watch Video Solution

16. In dihybrid cross,the test cross ratio will be

A. 9:3:3:1

B. 1:1:1:1

C. $1:1$

D. $15:1$

Answer: B

Watch Video Solution

17. Define hybrid.

Watch Video Solution

18. Down's syndrome is caused due to _____of chromosomes.

Watch Video Solution

19. Define the term'allele'

Watch Video Solution

20. Tuner's sybdrome is a_____aneuploidy.

Watch Video Solution

21. Describe haemophilia.

Watch Video Solution

22. Phenotypic ratio of a monohybrid F_2 progeny of incomplete dominance is

A. $1:1:1:1$

B. $1:2:1$

C. $3:1$

D. $2:1:1$

Answer: B

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23. Which one of the following trait of pea plants studied by mendel is dominant?

A. Green pod colour

B. Yellow pod colour

C. White pod colour

D. Terminal pod colour

Answer: A

Watch Video Solution

24. Which one of the following traits of garden pea studied by Mendel was a recessive feature?

A. Yellow seed colour

B. Yellow pod colour

C. Violet pod colour

D. Round seed colour

Answer: B

Watch Video Solution

25. Which one of the following trait of pea plant studied by Mendel is dominant?

A. Axial flower position

B. Green seed colour

C. Wrinkled seed colour

D. Yellow pod colour

Answer: B

Watch Video Solution

26. Which one of the following traits of garden pea studied by Mendel was a recessive feature?

A. Constricted pod shape

B. Round seed shape

C. Tall stem height

D. Green pod colour

Answer: B

Watch Video Solution

27. A child of O-group has B-group father. The genotype of father will be

A. $I^O I^O$

B. $I^B I^B$

C. $I^A I^B$

D. $I^B I^O$

Answer: D

Watch Video Solution

28. Aneuploidy.

Watch Video Solution

29. Which of the following do not have similar sex chromosomes? (Homogametic):

A. Human female

B. Drosophila female

C. Bird female

D. Bird male

Answer:

Watch Video Solution

30. What are homogametes and heterogametes?

Watch Video Solution

31. What are mutagens?

Watch Video Solution

32. Haemophilia is

A. Deficiency disorder

B. Y-linked disorder

C. X-linked disorder

D. Autosomal sex disorder

Answer: c

33. A normal woman whose father was colour blind is married to a normal man .The sons would be :

A. All colour blind

B. 75% colour blind

C. 50% colour disorder

D. All normal

Answer: a

Watch Video Solution

34. State any 'two' symptoms of Down's syndrome.

Watch Video Solution

35. Which of the following syndromes is an example of polyploidy?

A. Down

B. Klinefelter

C. Tuner

D. None of these

Answer: a

Watch Video Solution

36. The possible genotype of blood group A heterozygous condition is:

A. I^Ai

B. $I^A I^B$

C. $I^A I^A$

D. ii

Answer: a

Watch Video Solution

37. A colour blind male marries a normal female.What percentage of male children of this couple will be colour blind?

A. 0

B. 0.25

C. 0.5

D. 0.75

Answer: b

Watch Video Solution

38. The possible genotype of blood group 'O' is:

A. I^Bi

B. I^Ai

C. ii

D. $I^A I^B$

Answer: c

Watch Video Solution

39. Which condition is heterzygous?

A. TT

B. Tt

C. tt

D. All the above

Answer: b

Watch Video Solution

Revision Exercises Very Short Answer Type Questions B Questions From Cbse Examinations

1. In the following pedigree chart,state if the trait is autosomal dominant,autosomal recessive or sex linked .Give a reason for your answer:

View Text Solution

2. Name the respective pattern of inheritance where F 1 phenotype (a) does not resemble either of the two parents and is in between

the two. (b) resembles only one of the two parents.

Watch Video Solution

3. Write the percentage of pea plants that would be homozygous recessive in `F_()

Watch Video Solution

4. In a test cross progeny of pea plants ,all were bearing violet flowers.Give the genotypes

of the parent pea plants.

Watch Video Solution

5. How does incomplete dominance differ from co-dominance?

Watch Video Solution

6. Mention any two contrasting traits with respect to seeds in pea plant that were studied by Mendel.

Watch Video Solution

7. A geneticist interested in studying variations and patterns of inheritance in living beings prefers to choose organisms for experiments with shorter life cycle. Provide a reason.

Watch Video Solution

8. Name the type of cross that would help to find the genotype of a pea plant bearing violet flowers.

Watch Video Solution

9. State the fate of a pair of autosomes during gamete formation.

Watch Video Solution

10. A herd of cattle is showing reduced fertility and productivity . Provide one reason and one suggestion to overcome this problem.

Watch Video Solution

11. Name a human genetic disorder to the following:

(a)An additional X chromosome in male .

(b)Deletion of one X chromosome in a female

Watch Video Solution

12. State what does aneuploidy lead to?

Watch Video Solution

13. Why are no variations seen in clones?State two reasons.

Watch Video Solution

Revision Exercises Short Answer Type I A Questions From State Board Examinations

1. Why Mendel's work remain hidden for so many years?

Watch Video Solution

2. What is crossing over? In which stage of cell division it takes place?

Watch Video Solution

3. How is sex determined in human beings?

Watch Video Solution

4. What will be the phenotypes of F_1 generation when normal vision man (XY) marries colour blind woman $\left(X^C X^C\right)$

Watch Video Solution

5. What will be the phenotypes of F_1 generation if normal vision man (XY) marries a carrier female $(X^c Y)$.

Watch Video Solution

6. What is polyploidy and aneuploidy?

Watch Video Solution

7. Name two sex linked diseases.

Watch Video Solution

8. How did Mendel make sure that the pea plants were true breeding?

Watch Video Solution

9. How is Down's syndrome produced?

Watch Video Solution

10. Define the term co-dominance with one example.

Watch Video Solution

11. What is incomplete dominanace ?Give one example.

Watch Video Solution

12. Who rediscovered Mendelism?

Watch Video Solution

13. Stydy the following cross and answer the questions.

(a)Write the genotypes of father ,Mother and son.

(b)The type of dominance of human blood group inheritance is _____.

View Text Solution

14. Observe the figures and answer the questions.

(a)Identify the syndrome A and B.

(B)What is the chromosome numbers in A and B?

View Text Solution

15. Write the cuase and two symptoms of Klinefelter's syndrome.

Watch Video Solution

16. What are multiple alleles?Give one example.

Watch Video Solution

17. Differentiate between back cross and test cross.

Watch Video Solution

18. What are point mutations?Give one example of point mutations

Watch Video Solution

19. Differentiate between homozygous and heterozygous organisms.

Watch Video Solution

20. What is pleiotropy ?Give one example?

Watch Video Solution

21. What is sex-determination?Explain XX and XY type of sex determination.

Watch Video Solution

22. What is back cross?Explain with example.

Watch Video Solution

23. What is co-dominance ?Explain it by citing a suitable example.

Watch Video Solution

24. Examine the following fragment of beta globin chain in human haemoglobin and identify the hereditary disease with reasin

View Text Solution

25. What do you mean by pleiotropy ?Give example.

Watch Video Solution

26. Distinguish between homozygous and heterozygous.

Watch Video Solution

27. 

(a)Observe the above cross and name the phenomenon.

(b)Write down the theoretifcally given explanation of the phenomenon.

View Text Solution

28. A man with blood group A marries a woman with blood group B.What will be the genotype of man and woman if one of their

child is born with blood group O?Show the type of progeny formed with help of Punnett square.

Watch Video Solution

29. What do you mean by incomplete dominance ?Give example.

Watch Video Solution

30. Write a short note on Klinefelter's syndrome.

Watch Video Solution

31. Write a short note on Down's syndrome.

Watch Video Solution

32. Mention two differences between homozygous and heterozygous individuals.

Watch Video Solution

33. What are test cross and back cross?

Watch Video Solution

34. How many X chromosome (s) and autosomes are present in human ovum?

Watch Video Solution

35. Give the genotypic and phenotypic ratio of F_1, generation,when a hybrid tall (Tt) pea plant is crossed with a pure dwarf (tt)pea plant.

Watch Video Solution

Revision Exercises Short Answer Type I B Questions From Cbse Examinations

1. When a red flowered antirrhinum plant was crossed with a white flowered Antirrhinum

plant,the F_1 offspring had pink flowers.Mention:

(a)The genotype of F_1 plant

(b)The reason why it did not bear the parental red or white flower colours ?

Watch Video Solution

2. The following table shows the genotypes for ABO blood grouping and their phenotypeps .Fill in the gaps left in the table:

View Text Solution

3. Name the type of inheritance in which genotypic ratio is the same as the phenotypic ratio.Also give the ratio

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4. The male fruit fly and female fowl are heterogametic while the female fruit fly and the male fowl are homogametic. Why are they called so ?

Watch Video Solution

5. The human male and female bird are heterogametic,while the human female and male bird are homogametic .Why they are called so?

Watch Video Solution

6. In a pea plant ,smooth seed coat is dominant over wrinkled seed coat.What will be

expected ratio of phenotypes of the offspring in a cross between:

(i)Heterozygous smooth $\times$ Heterozygous smooth (ii)Heterozygous smooth $\times$ Homozygous wrinkled

(iii)Heterozygous smooth $\times$ Homozygous smooth

Watch Video Solution

7. In a particular plant species majority of the plants bear purple flowers. Very few plants

bear white flowers. No intermediate colours are observed. If you are given a plant bearing purple flowers, how would you ascertain that it is a pure breed for that trait? Explain.

Watch Video Solution

8. Diffferentiate phenotype and genotype.

Watch Video Solution

9. A cross between a red flower bearing plant and a white flower bearing plant of Antirrhinum produced all plants having pink flowers. Work out a cross to explain how this is possible.

Watch Video Solution

10. A cross was carried out between two pea plants showing the contrasting traits of height of the plant. The result of the cross

showed $50\ \%$ of parenal characters.

i) Work out the cross with the help of a Punnett square.

ii) Name the type of the cross carried out.

Watch Video Solution

11. How does the gene 'I' control ABO blood grous in humans? Write the effect the gene has on the structure of red blood cells.`

Watch Video Solution

12. Write the types of sex-determination mechanisms the following crosses show. Give an example of each type.

i) Female XX with Male XO

ii) Female ZW with male ZZ

Watch Video Solution

13. Write the scientific name of the fruit-fly. Why did Morgan prefer to work with fruit-flies for his experiments ? State any three reasons.

Watch Video Solution

14. In Snapdragon, a cross between true-breeding red flowered (RR) plants and true - breeding white flowered (rr) plants showed a progeny of plants with all pink flowers.

(a) The appearance of pint flowers is not known as blending. Why ?

(b) What is the phenomenon known as ?

Watch Video Solution

15. Differentiate between male and female heterogamety.

Watch Video Solution

16. State the mendelian principle which can be derived from a dihybrid cross and not from monohybrid cross

Watch Video Solution

17. Differentiate between Turner's syndrome and Down's syndrome.

Watch Video Solution

Revision Exercises Short Answer Type Ii Questions A Questions From State Board Examinations

1. Why is Mendel considered as Father of Genetics?

Watch Video Solution

2. Give the genotypic and phenotypic ratio of F_1, generation,when a hybrid tall (Tt) pea plant is crossed with a pure dwarf (tt)pea plant.

Watch Video Solution

3. When a homozygous plant that is tall,is crossed with homozygous dward,it produce all heterozygous tall plants inF_1 generation

.What will be the appearance of the offsprings of a cross of F_1 with its tall parent.

Watch Video Solution

4. A pea plant with purple flowers was crossed with white flowers producing all 50 plants with only purple flowers. On selfing, these plants produced 482 plants with purple flowers and 162 with white flowers. What genetic mechanism accounts for these results? Explain.

Watch Video Solution

5. Women are often blamed for producing female children. Consequently, they are ill treated and ostracized. How will you address this issue scientifically if you were to conduct an awareness programme to highlighg the values involved?

Watch Video Solution

6. Explain polygenic inheritance in relation to skin colour in man.

Watch Video Solution

7. Explain incomplete dominance with sutiable example.

Watch Video Solution

8. What is pleiotopy?

Watch Video Solution

9. A woman having blood group O married with a man having blood group AB. Which blood group may be expected in their progeny? Explain with diagrammatic sketch.

Watch Video Solution

10. Explain the following terms with example

(a) Co-dominance

(b) Incomplete dominance

Watch Video Solution

11. Differentiate between complete linkage and incomplete linkage.

Watch Video Solution

12. Explain the following terms with example

(a) Co-dominance

(b) Incomplete dominance

Watch Video Solution

13. Mention any two autosomal genetic disorders with their symptoms

Watch Video Solution

14. Describe the Mendel's law of Independent Assortment with suitable cross.

Watch Video Solution

15. What are chromosomal abbreviation? Explain in pea plants

Watch Video Solution

16. Describe various contrasting traits studied by Mendel in pea plants

Watch Video Solution

17. What is male heterogamy?Describe it in different organisms.

Watch Video Solution

18. Explain Mendel's test cross only by figure.

Watch Video Solution

19. How is sex determined in human beings? Explain with the help of diagram.

Watch Video Solution

20. If a man with blood group "O" marries a woman with blood group "AB" ,what are the possible blood groups of their offsprings?

Watch Video Solution

21. Who proposed chromosomal theory of inheritance?What are the main points of this theory?

Watch Video Solution

22. Explain law of independent assortment in terms of dihybrid cross with suitable example?

Watch Video Solution

23. What is numerical chromosomal mutation? Give its three genetic disorder?

Watch Video Solution

24. s law of purity of gametes.

Watch Video Solution

25. A carrier woman for haemophilia marries a haemophilic man.Show the type of progeny formed with the help of punnet square?

Watch Video Solution

26. Write a short note on multiple alleles considering the example of human blood

group.

Watch Video Solution

27. During a medical investigation, an infant was found to possess an extra chromosomes 21. Describe the symptoms the child is likely to develop later in the life.

Watch Video Solution

28. What is a test cross ? How can it decipher the heterozygosity of a plant ?

Watch Video Solution

29. Write all you know about Klinefelter's syndrome.

Watch Video Solution

30. During the studies on genes in Drosopila that were sex-linked T.H. Morgan found F2-populabon phenotypic ratios deviated from expected 9 : 3 : 3 : 1. Explain the conclusion he arrived at.

Watch Video Solution

31. Why is pedigree analysis done in study of human genetics ? State the conclusions that can be drawn from it.

Watch Video Solution

32. What is test cross and how does It differ from back cross?

Watch Video Solution

33. How is Tuner's syndrome produced?

Watch Video Solution

34. DIFFERENCE BETWEEN SELF POLLINATION AND CROSS POLLINATION

Watch Video Solution

35. Explain Mendel's law of segregation with a suitable example.

Watch Video Solution

36. With the help of one example, explain the phenomena of-dominance and multiple allelism in human population.

Watch Video Solution

37. What will be phenotype of F_1 generation when the normal man (XY) marries a carrier women $\left(X^hX\right)$ for haemophilia?

Watch Video Solution

38. Explain incomplete dominance with sutiable example.

Watch Video Solution

39. What will be the phenotype of F_1 generation when a haemophilic man $\left(X^hY\right)$ marries a carrier women $\left(X^hX\right)$?

Watch Video Solution

40. Describe Griffith's experiment of transformation.

Watch Video Solution

41. Taking the example of ABO blood type of humans,explain the phenomenon of multiple alleles.

Watch Video Solution

42. A haemophilic man marries a woman whose mother was normal but her father was haemophilic.What percentage of children would be there to be haemophilic ?Explain with necessary crossing.

Watch Video Solution

43. What are complementary genes?Explain with the help of an example.

Watch Video Solution

44. What is incomplete dominance ?Explain the inheritance pattern of incomplete dominance in 4 O'clock plant.

Watch Video Solution

45. Explain three salient features of Mutation theory.

Watch Video Solution

46. A child has blood group O. If the father has blood group A and mother blood group B, work out the genotypes of the parents and the possible genotypes of the other offsprings.

Watch Video Solution

47. Write short notes on the following:

(i)Pleiotropy (b)Linkage

Watch Video Solution

48. Describe the complete process of crossing over.

Watch Video Solution

49. Describe the chromosomal theory of inheritance ?Distinguish between incomplete dominance and codominance.

Watch Video Solution

50. What do you mean by sex-linked inheritance? Mention the cause and symptoms of Tuner's syndrome.

Watch Video Solution

51. Man with AB blood group has married a woman with O group .Show the possible genotype and phenotypes of the progeny.

Watch Video Solution

52. Give the example of an autosome genetic disease.What is its reason?

 Watch Video Solution

Revision Exercises Short Answer Type Ii Questions B Questions From Cbse Examinations

1. (a)Why is haemophilia generally obsereved in human male?Explain the conditions under which a human female can be haemophiliac.

(b)A pregnant human female was advised to

undergo M.T.P It was diagnosed by her doctor that the foetus she is carrying has developed from a zygote formed by an XX-egg fertilized by Y-carrying sperm.Why was she advised to undergo M.T.P?

Watch Video Solution

2. (a) Explain the phenomena of multiple allelism and co-dominance taking ABO blood group as an example.

(b) What is the phenotype of the following :

$(i) I^A i$

(ii) ii

Watch Video Solution

3. (a) Why is it that the father never passes on the gene for haemophilia to his sons? Explain.

(b) State the functions of the following in a prokaryote :

(i) tRNA, (ii) rRNA

Watch Video Solution

4. "Multiple alleles can be found only when population studies are made."Explain with the help of example in humans.

Watch Video Solution

5. In a cross between a true breeding red flowered and true breeding white flowered snapdragon plant,the F_1 plants

Produced pink flowers.Name and explain the type of inheritance.

Watch Video Solution

6. Pea seeds with BB alleles have round seeds and large strach grains ,While seeds with bb alleles have wrinkled seeds with small strach grains.Work out the cross between these two parents .Explain the phenotypic ratio of the progeny with respect to seed shape and the starch gain size of the progeny produced.

Watch Video Solution

7. Why is the frequency of red-green colourblindness is many times higher in males than that in the females?

Watch Video Solution

8. A color-blind child is born to a normal couple. Work out a cross to show how it is possible. Mention the sex of this child.

Watch Video Solution

9. Mendel published his work on inheritance of characters in 1865, but is remained unrecognized till 1900. Give three reasons for the delay in accepting his work.

Watch Video Solution

10. A cross between a normal couple resulted in a son who was hemophilic and a normal daugher. In course of time, when the daugther was married to a normal man, to their surprise, the grandson was also hemophilic.

a) Represent this cross in the form of pedigree chart. Give the genotypes of the daughter and her husband.

b) Write the conclusion you draw of the inheritance pattern of this disease.

Watch Video Solution

11. Linkage and crossing-over of genes are alternatives of each other. Justify with the help of an example.

Watch Video Solution

12. A teachers wants his/her students to find the genotypes of pea plants bearing purple coloured flowers in their school garden. Name and explain the cross that will make it possible.

Watch Video Solution

13. (a) A couple with blood groups 'A' and 'B' respectively have a child with blood group 'O'. Wrok out a cross to show how it is possible

and the probable blood groups that can be expected in their other off-springs.

(b) Explain the genetic basis of blood groups in human population.

Watch Video Solution

14. A large number married couples the world over are childless. It is shocking to know that in India the female partner is often blamed for the couple being childless.

(a)Why in your opinion the female partner is

often blamed for such situations in India? Mention any two values that you as biology student can promote to check this social evil.

(b) State any two reasons responsible for the cause of infertility.

(c) Suggest a technique that can help the couple to have a child where the problem is with the male partner.

Watch Video Solution

15. What is a test cross ? How can it decipher the heterozygosity of a plant ?

Watch Video Solution

16. Can a plant flowering in Mumbai be pollinated by pollen grains of the same species growing in New Delhi ? Provide explanations to your answer

Watch Video Solution

17. Both Heamophilia and Thalassemia are blood related disorders in humans Write their causes and the the difference between the two . Name the category of genetic disorder they both come under .

Watch Video Solution

18. What is heterogamy ?Explain the mechanism of sex determination in Drosophila.

Watch Video Solution

Revision Exercises Long Answer Type Questions A Questions From State Board Examinations

1. Explain Mendel's test cross only by figure.

Watch Video Solution

2. A Women having blood group 'O' married with a man having blood group 'A'.Which

blood group may be expected in their progeny?Explain with on example.

 Watch Video Solution

3. Explain mutation with one example.

 Watch Video Solution

4. What are genetic diseases?How many number of chromosome are in Down

syndrome(Mongolism)person ?What is its Character?

 Watch Video Solution

5. Enunciate mendel's of segregation with the help of a monohybrid cross.

 Watch Video Solution

6. Define Mendel's law of segregation.Draw only Punnet's square to explain this law.

Watch Video Solution

7. (a)Define mutation.

(b)Describe in detail chromosomal mutation or aberrations.

Watch Video Solution

8. (a)Define crossing over.

(b)Explain its mechanism with suitable diagrams

Watch Video Solution

9. Briefly describe inheritance pattern of harmophilia In human.

Watch Video Solution

10. State the law of Independent Assortment.Explain it by using Punnet square.

Watch Video Solution

11. State and explain the phenomenon of co-dominance.

Watch Video Solution

12. What are varaitions?Describe the role of variation in evolution.

Watch Video Solution

13. A man with AB blood group marries a woman with O blood group .Show the

genotype and phenotypes of their progeny.

Watch Video Solution

14. State Mendel's law of Independent Assortment.Support the law by showing the dihybrid cross between yellow and round seeded plant (YYRR) and green wrinkled seeded (yyrr) plant for two generations.Show the F_2 phenotypic ratio.

Watch Video Solution

15. Aman with blood groupAmarried a woman With B greup. They have a son withAB blood group and a daughter with blood group O. Work out the cross and show the possibility of such inheritance.

Watch Video Solution

16. What is pedigree analysis? Suggest how such an analysis, can be useful.

Watch Video Solution

17. Briefly mention the contribution of T.H. Morgan in genetics.

Watch Video Solution

18. Explain the following terms with example

(a) Co-dominance

(b) Incomplete dominance

Watch Video Solution

19. In garden pea tall (T) is dominant to dwarf (t) and red colour flower (R) is dominant to white (r).A pure tall red-flowered plant is crossed to dwarf white-flowered plant and the F_1 hybrid were allowed to self-fertilize.

(i)Give the perental genotype.

(ii)Give the genotypic and phenotypic ratio of the F_2 generation using Punnet square.

Watch Video Solution

20. In human being,blue eye colour is recessive to brown eye.A brown eyed man has a blue-eyed mother.

(a)What is the genotype of the man and his mother?

(b)What are the possible genotypes of his offspring if he marries a blue-eyed woman?

Watch Video Solution

21. Compare the behavior of chromosomes with Mendelian factors.

Watch Video Solution

22. Why does genetic variaton occur in sexually reproducing organism.Explain the cause in detail.

Watch Video Solution

23. Who put forward the chromosomal theory of inheritance?Discuss its sallent features.

Watch Video Solution

24. When a red flowered Antirrhinum plant was crossed with a white flowered Antirrhinum plants,the F_1 offspring has pink flowers? Mention:

(b)The reason why it did not bear the parental red or white flower colours.

Watch Video Solution

25. Explain the chromosomal theory of inheritance. OR Explain the chromosomal theory.

Watch Video Solution

26. Write down the characteristics of Klinefelter's syndrome and Tuner's syndrome .Mention the chromosomal abnormalities in each of the above mentioned cases.

Watch Video Solution

27. State and exaplain the low of independent and assortment' in a typical Mendelian dihybridc cross.

Watch Video Solution

28. What is linkage?Describe its types.Give four factors affecting linkage.

Watch Video Solution

29. (a)State and explain the Law of Dominance using a Monohybrid cross.

(b)Which plant was selected by Mendel for his experiments and why?

Watch Video Solution

30. CHROMOSOMAL THEORY OF INHERITANCE

Watch Video Solution

31. Explain polygenic inheritance with an example.

Watch Video Solution

32. Explain the ineritance of one gene with reference to stem height of garden pea plant.

Watch Video Solution

33. Explain the mechanism of transcription in prokaryotes.

Watch Video Solution

34. Sketch and label 'clover leaf model' of T-RNA .

Watch Video Solution

35. CHROMOSOMAL THEORY OF INHERITANCE

Watch Video Solution

36. (a)Who rediscovered Mendel's Laws?

(b)Why Mendel selected pea plant for genetic research?

Watch Video Solution

37. What is incomplete dominance ?Explain with reference to flower colour in snapdragon

Watch Video Solution

38. Explain incomplete dominance with sutiable example.

Watch Video Solution

Revision Exercises Long Answer Type Questions B Questions From Cbse Examinations

1. Inheritance pattern of ABO blood groups in humans shows dominance. codominance and multiple allelism. Explain each concept with help of blood group genotypes.

Watch Video Solution

2. (a) State the law of independent assortment.

(b) Using Punnett Square demonstrate the law of independent assortment in a dihybrid cross involving two heterozygous parents.

Watch Video Solution

3. (a) List the three different allelic forms of gene 'I' in humans. Explain the different phenotypic expressions, controlled by these three forms.

(b) A woman with blood group 'A marries a man with blood group 'O'. Discuss the possibilities of the inheritance of the blood groups in the following starting with "yes" or "no" for each:

(i) They produce children with blood group "A" only.

(ii) They produce children some with "O" blood group and some with "A" blood group.

Watch Video Solution

4. (a) Explain a monohybrid cross taking seed coat colour as a trait 1n Pisum sativum. Work out the cross upto F generation.

(b) State the laws of inheritance that can be derived from such a cross.

(c) How is the phenotypic ratio of F2 generation different in a dihybrid cross?

Watch Video Solution

5. (a) A garden pea plant bearing terminal, violet flowers, when med with another pea plant bearing axial, violet flowers, produced axial, violet aowers and axial, white flowers in the ratio of 3 : 1.

Work out the cross showing the genotypes of the parent pea plants and their progeny.

(b) Name and state the law that can be derived from this cross and not from a monohybrid cross.

Watch Video Solution

6. Inheritance pattern of flower colour in garden pea plant and snapdragon differs. Why is this difference observed? Explain showing the crosses up to F_2 generation.

Watch Video Solution

7. Why are human females rarely haemophilic? Explain. How do haemophilic patients suffer?

Watch Video Solution

8. Explain the mechanism of sex-determination in humans.

b) Differentiate between male heterogamety and female heterogamety with the help of an example of each.

Watch Video Solution

9. How Is sex determined in human beings?Has the environment any role to play ?Explain in

brief.

Watch Video Solution

10. If there is a history of haemophilia in the family, the chances of male members becoming haemophilic are more than that of the female.

(a) Why is it so ?

(b) Write the symptoms of the disease.

Watch Video Solution

11. Aneuploidy of chromosomes in human beings results in certain disorders. Draw out the possibilities of the karyotype in common disorders of this in human beings and its consequences in individuals.

Watch Video Solution

12. In a dihybrid cross, white eyed, yellow bodied female Drosophila was crossed with red eyed, brown bodied male Drosophila. The cross produced $1 \cdot 3$ percent recombinants

and $98 \cdot 7$ progeny with parental type combinations in the F_2 generation. Analyze the above observation and compare with the Mendelian dihybrid cross.

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Competition File Objective Type Questions A Multiple Choice Questions Mcqs

1. Gene for colour blindness is located on:

A. Y chromosome

B. 13th chromosome

C. X chromosome

D. 21 st chromosome

Answer: c

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2. haemophilia is due to:

A. factor-VI

B. factor-VII

C. factor-VIII

D. factor-IX

Answer: c

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3. Which of these is a dominant factor ?

A. Rh factors

B. Haemophilia

C. Albinism

D. Colourblindness

Answer: a

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4. What is the ratio of parental phenotypes in the F2 generation of dihybrid cross ?

A. $9:3:3:1$

B. $1:2:2:4:1:2:1:2:1$

C. $7:1:1:7$

D. $12:3:4$

Answer: a

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5. The gene which controls many characters is called:

A. Condominant gene

B. Polygene

C. Pleiotropic gene

D. Multiple gene

Answer: c

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6. Down 's syndrome is due to

A. Linkage

B. Sex linked inheritance

C. Crossing over

D. Non-disjunction of chromosome

Answer: d

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7. Sickle cell anaemia is

A. Autosomal dominant inheritance

B. X-linked recessive inheritance

C. Autosomal recessive inheritance

D. X-linked dominant inheritance

Answer: c

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8. Polyploidy can be produced artificially by :

A. Colchicine

B. Inbreeding

C. Line breeding

D. Self pollination

Answer: a

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9. Kinefelter's syndrome is due to:

A. One X and two Y

B. Two X and one Y

C. One X only

D. One Y only

Answer: b

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10. Karyotype is :

A. Chromosome complement which is specific for each species of living organism

B. Division of nucleus

C. None of the above

D.

Answer: a

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11. Sickle cell anaemia is

A. An autosomal linked dominant trait

B. Caused by subsitution of valine by glumic acid in the β-globin chain of haemoglobin

C. Caused by a change in base pair of DNA

D. Characterized by elongated sickle like RBCs with a nucleus

Answer: c

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12. Point mutation involves

A. Insertion

B. change in single base pair

C. Duplication

D. Deletion

Answer: b

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13. Select the incorrect statement from the following

A. Linkage is an exception to the principle of independent assortment in heredity

B. Galactosemia is an inborn error of metabolism

C. Small population size results in randon genetic drift in a population

D. Baldness is a sex limited trait

Answer: d

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14. A woman is married for the second time. Her first husband was ABO blood type A, and her child by that marriage was type O. Her new husband is type B and their child is type AB. What is the woman's ABO genotype and blood type

A. $I^A I^O$,Blood type A

B. $I^A I^B$, Blood type AB

C. $I^B I^O$, Blood type B

D. $I^A I^O$,Blood type O

Answer: a

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15. In prokaryotes, the process of replication is cataysed by the following enzymes. Identify

which of the enzymes is best coordinate with the role

A. Helicase-Joins the ends of DNA segments

B. DNA polymerase-I-syntheses DNA

C. DNA polymerase-II-Erases primerr and fills gaps

D. Primase-Synthesis RNA primers

Answer: d

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16. Who proposed mutation theory ____

A. Lamarck

B. Darwin

C. Wallace

D. Hugo de crics

Answer: d

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17. Identify the wrong statement

A. In male grasshoppers 50% sperms have no sex chromosome

B. Usually female birds produce two type of gametes based in sex chromosomes

C. The human males have one of their sex chromosomes much shorter than the order

D. In domesticted showls the sex of the progeny depends on the type of sperm that fertilizes the egg

Answer: e

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18. ABO blood grouping in human beings cites the example of

A. Dominance

B. Incomplete dominance

C. Co-dominance

D. (iv) and (ii) only

Answer: c

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19. Which of the following genotypes does notproduce any sugar polymer on the surface of the RBC

A. $I^A I^A$

B. Ii^B

C. $I^A I^B$

D. `I^(B)I^(B)

Answer: d

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20. Gynaecomastia is a common feature seen in

A. Down's syndrome

B. Tuner's syndrome

C. PKU

D. Klinefelter's syndrome

Answer: e

Watch Video Solution

21. Which of the following is not a Mendelian disroder

A. haemophilia

B. Cystic fibrosis

C. Colour blindness

D. Tuner's syndrome

Answer: e

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22. Haemophilia in man is due to

A. Sex-linked inheritance

B. Sex-limited inheritance

C. Sex-influenced inheritance

D. Primary non-disjunction

Answer: a

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23. Inheritance of flower colour is an example of incomplete dominance, which is seen in

A. Antrrhinum

B. Pisum

C. Solanum

D. Hibiscus

Answer: a

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24. The graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross is called

A. Pedigree analysis

B. Karyotype

C. Punnet square

D. Chromosome map

Answer: c

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25. Single step large mutation leading to speciation is also called

A. Founder effect

B. saltation

C. Branching descent

D. Natural selection

Answer: b

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26. In Antirrhinium two plants with pink flowers were hybridized. The F_1 plants producedred, pink and white flowers in the proportion of 1 red, 2 pink and1 white. What could be the genotype of the two plants used for hybridization. Red flower colour is determined by RR, and white rr genes

A. rrrr

B. RR

C. Rr

D. rr

Answer: c

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27. A cross in which an organism showing a dominant phentype is crossed with the recessive parent in order to know its genotype is called:

A. Monihybrid cross

B. Back cross

C. Test cross

D. Dihybrid cross

Answer: c

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28. ABO blood grouping is controlled by gene I which has three alleles and show co-dominance. There are six genotypes. How many phenotypes in all are possible?

A. Six

B. Three

C. Four

D. Five

Answer: c

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29. The fruit fly Drosophila melanogaster was found to be very suitable for expermiental verification of chromosomal theory on

inheritanc by Morgan and his coleagues because

A. It reproduces parthenogenetically

B. A single mating produces two young files

C. Smaller female is easily recognusable from larger male

D. It completes life cycle in about two weeks

Answer: d

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30. Phenotypic ratio in plant Snapdragon in F_2 is:

A. $1:1$

B. $2:1$

C. $3:1$

D.

Answer: d

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31. Which of the following conditions is called monosomic?

A. 2n+1

B. 2n+2

C. n+1

D. 2n-1

Answer: d

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32. Chromosome is made up of:

A. DNA+pectin

B. RNA+DNA

C. DNA+histone

D. only histone

Answer: c

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33. Triticale is produced by the crossing of :

A. Wheat and rye

B. Wheat and maize

C. Whear and barley

D. Rye and maize

Answer: a

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34. What type of sex determination is found in Grasshopper

A. XX-XO

B. XX-XY

C. ZZ-ZY

D. ZW-ZZ

Answer: a

Watch Video Solution

35. Test cross is used to check

A. Check heterozygosity in F_1 generation

B. Check heterozygosity in F_2 generation

C. Check indpendent assortment

D. Check segregation

Answer: a

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36. The phenomenon, in which an alleles of one gene suppresses the activity of an allele of another gene, is known as

A. Epistasis

B. Dominance

C. Suppression

D. Inactivation

Answer: a

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37. The ultimate biological unit which controls heredity, is called :

A. Genome

B. Chromosome

C. Genotype

D. Gene

Answer: d

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38. For making important contributions in respect of the nature of gene, the Noble Prize was rewarded to

A. T.H Morgan

B. De vries

C. H.J Muller

D. Darwin

Answer: a

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39. Moody describes the mutation as

A. Sports

B. Saltations

C. Factors

D. Shotgun

Answer: a

Watch Video Solution

40. Which of the blood groups can be given to any person:

A. A

B. Back cross

C. AB

D. O

Answer: d

Watch Video Solution

41. The number of autosomes in human sperm are:

A. 11

B. 22

C. 44

D. 45

Answer: b

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42. A nucleoside differs from a nucleotide is not having -

A. Sugar

B. Glucose

C. Nitrogenous base

D. Phosphate group

Answer: d

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43. A pea plant parent having violet coloured flowers with unknown genotype was a plant having white coloured flowers in the progeny 50% of the flowers were violet and 50% were white. The genotype constitution of the parent having violet coloured flower was:

A. Homozygous

B. Merozygous

C. Heterozygous

D. hemizygous

Answer: c

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44. The number of linkage group (s) present In Escherichia Coli is :

A. One

B. Two

C. Four

D. Seven

Answer: a

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45. The major cause of evolution of genes and protein is

A. Point mutation

B. Chromosomal aberration

C. Sexual reproduction

D. Gene duplication and divergence

Answer: a

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46. Mendel's principle of segregation means that the germ cells always receive:

A. One pair of alleles

B. One quarter of genes

C. One of paired allels

D. Any pair of alleles

Answer: c

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47. Mendel found that reciprocal crosses yielded indentical results. From that he concluded

A. There is independent assortment of trait

B. Sex plays a role in deciding the dominance of a trait

C. There is no dominance of any trait

D. Sex has no influence on the dominance of traits

Answer: d

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48. Due to the nondisjunctiuon of chromosomes during spermatogenesis, sperms carry both sex chromosomes (22A + XY) and some sperms do not carry any sex chromosome (22A + O). If these sperms

fertilise normal eggs (22A + X), what types of genetic disorders appear among the offsprings ?

A. Tuner's syndrome and klinefelter,s syndrome

B. Down's syndrome and Klinefelter's syndrome

C. Down's syndrome and Tuner's syndrome

D. Down's syndrome and cri-du-chat syndrome

Answer: a

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49. Which one of the following conditions of the zygotic cell would lead to the birth of a normal human female child

A. Only one X chromosome

B. One X and one Y chromosome

C. Two X chromosomes

D. Only one Y chromosome

Answer: c

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50. Test cross in plants or in Drosophila involves crossing:

A. The F_1 hybrid with a double recessive genotype

B. Between two genotypes with dominant trait

C. Between two genotypes with recessive trait

D. Between two F_1 hybrids

Answer: a

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51. Which one of the following conditions correctly describes the manner of determining the sex in the given example?

A. Homozygous sex chromosomes (ZZ) determine female sex in birds

B. XO type of sex chromosomes determine male sex in grasshopper

C. XO condition in human as found in Tuner syndrome ,determines female sex

D. Homozygous sex chromosomes (XX) produce male in Drosphila

Answer: b

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52. Mutations can be induced with

A. Infra red radiations

B. IAA

C. Ethylene

D. Gamma radiations

Answer: d

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53. A person with unknown blood group under ABO system, has suffered much loss in an accident and needs immediate blood trasfusion. His one friend who has a valid certifacte of his own blood type. What would have been the type of blood group of the donor friend

A. Type B

B. Type AB

C. Type O

D. Type A

Answer: a

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54. Experimental verification of chromosomal theroy of inheritance was gtiven by

A. Gregor Johann Mendel

B. Hugo de Vries

C. Langdon Dam

D. Thomas Hunt Morgan

Answer: e

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55. The chromosome condition in Turner syndrome is :

A. 21 trisomy with XY

B. 44 autosome+XXY

C. 44 autosomes+XYY

D. 44 autosomes+XO

Answer: d

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56. In Mendelian dihybrid cross when heterozygous Round Yellow are self crossed, Round Green offsprings are represented by the genotype:

A. RrYy,RrYY,RRYy

B. Rryy,RRyy,rryy

C. rrYy,rrYY

D. RrYY,Rryy

Answer: d

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57. The loss of a chromosmal segment is due to :

A. Polyploidy

B. Deletion

C. Duplication

D. Inversion

Answer: b

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58. XO type of sex determination is seen in

A. Man

B. grasshopper

C. Horses

D. Drosophila

Answer: b

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59. Allelism refers to

A. Genic interactions controlling a character

B. Multiple genes controlling a character

C. Expression of many characters by a single gene

D. Alternative forms of a gene at a give locus

Answer: d

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60. Mendelian principles are not applicable in case of

A. Sex linked alleles

B. Asexually reproducing forms

C. Sexually in-breeding forms

D. Diploid homozygous forms

Answer: b

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61. Genotypic and phenotypic ratio in monohybrid cross remains the same in case of

A. Sex linked genes

B. Pseudoallelic genes

C. Intermediate inheritance

D. Dominant and recessive genes

Answer: c

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62. Mendel was successful in discovering the principles of inheritance as

A. He look pea plants for his experiments

B. He did not encounter linkage between the genes for the characters he considered

C. He had an in-depth knowledge on hybridization

D. He was a famous mathematician

Answer: b

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63. Crossing over is the exchange of genetic material between:

A. Non-sister chromatids of the homologous chromosomes

B. Sister chromatids of the homologous chromosomes

C. Chromatids of non-homologous chromosome

D. The gene those are completely linked

Answer: a

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64. A hereditary disease which is never passed on from father to son is

A. X-chromosomal linked disease

B. Autosomal linked disease

C. Y-chromosomal linked disease

D. None of the above

Answer: a

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65. If a colour blind man marries a girl who is normal (homozygous) for this charactr, then genotypically :-

A. Sons and daughters will be normal

B. Sons will be colour blind,daughter will be normal

C. Sons will be normal,daughters will be carriers

D. Both sons and daughter will be colour blind

Answer: c

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66. Frequency of crossing over will be relatively more if :

A. Distance between the two gene is less

B. Distance between the two gene is more

C. Linked genes are more

D. Both (b) and (C)

Answer: b

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67. The existence within a population of non-beneficial alleles in heterozygous genotype is :-

A. Genetic load

B. Genetic drift

C. Genetic flow

D. Selection

Answer: a

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68. Presence of recombinants is due to :

A. Crossing over

B. Linkage

C. Lack of independent assortment

D. All of the above

Answer: a

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69. Genes for cytoplasmic male sterility in plants are located in

A. Chloroplast genome

B. Mitochondrial genome

C. Nuclear genome

D. Cytosol

Answer: d

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70. How many types of genetically different gametes will be produced by a heterozygous plant having the genotype AABbCc?

A. Two

B. Four

C. Six

D. Nine

Answer: b

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71. Two allelic genes are located on

A. The same chromosome

B. Two homologous chromosome

C. Two non-homologous chromosomes

D. Any two chromosomes

Answer: b

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72. A test cross is carried out to

A. Determine the genotype of a plant at F_2

B. Predict whether two traits are linked

C. Assess the number of alleles of a gene

D. Determine whether two species or varieties will successfully

Answer: a

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73. The idea of mutations was brought forth by

A. Hugo de Vries who worked on evening primrose

B. Gregor Mendel who worked on pisum sativum

C. hardy weinberg who worked on allele freqyencies in a population

D. Charles Darwin who obsereved a wide variety of organisms during sea voyage

Answer: a

74. Among the seven pairs of contrasting traits in pea plant as studied by Mendel, the number of traits related to flower, pod and seed respectively were

A. 2,2,2

B. 2,2,1

C. 1,2,2

D. 1,1,2

Answer: a

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75. Crick one of the discoverer of DNA double helical stucture, was the man of

A. Physics

B. Chemistry

C. Zoology

D. Botany

Answer: a

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76. Some of the dominant traits studied by Mendel were

A. Round seed shape,constricted pod shape and axial flower position

B. Green pod colour,inflated pod shape and axial flower position

C. Yellow seed colour,violer flower colour and yellow pod colour

D. Axial flower position,green pod colour and green seed colour

Answer: b

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77. In a dihybrid cross where two parents differ in two pairs of contrasting traits like seed color yellow (YY) and seed color green (yy) with seed shape wrinkled (rr) the number of

green colo0ured seeds (yy) among sixteen products of F_2 generation will be

A. 2

B. 4

C. 6

D. 8

Answer: b

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78. The colour based contrasting traits in seven contrasting pairs, studied by Mendel in pea plant were

A. 1

B. 2

C. 3

D. 4

Answer: c

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79. The number of autosomes in a normal human cell is :

A. 44

B. 45

C. 46

D. 48

Answer: a

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80. Down's syndrome is associated with trisomy of chromosome number:

A. 20

B. 21

C. 22

D. 23

Answer: b

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81. The syndrome in which individual somatic cell contains three sex chromosome,XXX is called :

A. Klinefelter's syndrome

B. Tuner's syndrome

C. Down's syndrome

D. Supermale

Answer: a

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82. Antibodies resemble which of the following shape?

A. X

B. Y

C. Z

D. O

Answer: b

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83. When yellow round heterozygous pea plants are self fertilised, the frequency of occurrence of RrYY genotype among the offspring is

A. $9/16$

B. $3/16$

C. $2/16$

D. $1/16$

Answer: c

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84. In XO type of sex determination

A. Females produce two different types of gametes

B. Males produce two different types of gametes

C. Females produce gametes with Y chromosomes

D. Males produce single type of gametes

Answer: b

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85. Who used the frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes and mapped their position on the chromosome?

A. Gregor Mendel

B. Correns

C. Tschemark

D. Alfred Sturtevant

Answer: e

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86. Sickle cell anaemia is caused by the subsitution of :

A. Valine by glutamic acid at sixth position of alpha chain of haemoglobin

B. Valine by glutamic acid at sixth position of beta chain of haemoglobin

C. Glutamic acid by valine at sixth position of alpha chain of haemoglobin

D. Glutamic acid by valine at sixth position of beta chain of haemoglobin

Answer: d

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87. Who postulated the "Chromosomes" Theory of Inheritance

Or

The behaviour of the chromosomes was parallel to the behavior of genes during meosis was noted by

A. Correns

B. Tschemark

C. Sutton and Boveri

D. de Vries

Answer: c

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88. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group : 'AB' blood group : 'B' blood group in 1 : 2 : 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of

A. incomplete dominance

B. Partical dominance

C. Complete dominance

D. Codominance

Answer: d

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89. Which Mendelian idea is depicted by a cross in which the F_1-generation resembles both the parents?

A. Law of dominance

B. Inheritance of one gene

C. Co-dominance

D. incomplete dominance

Answer: b

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90. If both parents are carriers for thalassaemia, which is an autosomal recessive

disorder, what are the chances of pregnancy resulting in an affected child?

A. 0.5

B. 0.25

C. 1

D. No chance

Answer: b

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91. Which of the following statements is not true of two genes that show 50% recombination frequency?

A. The gene are tightly linked

B. The genes show independent assortement

C. If the genes are present on the same chromosome,they undergo more than one crossoves in every meiosis

D. The gene may be on different chromosomes.

Answer: a

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92. To analyse the genotype of an organism,it is made to:

A. Self cross

B. Cross with recessive parent

C. Cross with dominant parent

D. Cross with another species

Answer: b

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93. In Mendel's seven characters of Pea, total number of colours tested by him was

A. 2

B. 3

C. 4

D. 5

Answer: b

Watch Video Solution

94. Heterogemete is the where an individual produce two types of gametes. The most appropriate anwer is :

A. Male Drosophila fly

B. Female drosophil fly

C. Female bird

D. (a) and (C)

Answer: d

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95. Choose a false statement with reference to sickle cell anaemia:

A. Have genotype Hb^s / Hb^s

B. Have genotype Hb^A / Hb^A

C. Substitution of glutamic acid to valine

D. Have sickle shape RBC

Answer: b

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96. A man whose father was colour blind marries a woman who had a colour blind mother and normal father. What percentage

of male children of this couple will be colour blind

A. 0.25

B. 0

C. 0.5

D. 0.75

Answer: c

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97. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is

A. 0.4

B. 0.5

C. 0.6

D. 0.7

Answer: a

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98. A human female with Turneer's syndrome

A. Has 45 chromosomes with XO

B. Has one additional X chromosome

C. Exhinits male characters

D. Is able to produce children with normal husband

Answer: b

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99. Person with blood group AB is considered as universal recipient because he has

A. Both A and B antigens on RBC but no antibodies in the plasma

B. Both A and B antibodies in the plasma

C. No antigen on RBC and no anibody in the plasma

D. Both A and B antigens in the plasma but no antibodies.

Answer: a

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100. Fruit colour in squash is an example of

A. Recessive epistasis

B. Dominant epistasis

C. Complementary genes

D. Inhibitory genes

Answer: c

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101. When a gene pair in an organism contains two indentical alleles,the organism is condered to be:

A. Phenotypic

B. Genotypic

C. Homozygous

D. Heterozygous

Answer: d

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102. The exchange of genetic material between chromatids of paired homologous chromosomes during first meiotic division is called

A. Transformation

B. Chiasmata

C. crossing -over

D. synapsis

Answer: b

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103. A pleiotropic gene:

A. Controls a trait only in combiation with another gene

B. Controls multiple traits is an individual

C. Is expressed only in primitive plants

D. Is a gene evolved during pleiocene

Answer: a

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104. Skin colour in humans is an example of

A. intragenic interaction

B. Interallelic interaction

C. Quantitative interaction

D. Pleiotropy

Answer: c

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105. Howmany types of gemete will be produced by an individual having genotype AaBbcc:

A. Four

B. three

C. two

D. One

Answer: a

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106. Find the odd one out, with respect to X-linkage

A. Haemophilia

B. Myopia

C. Nephritis

D. Night blindness

Answer: b

Watch Video Solution

107. Epicanthal skin fold and simian crease are characteristics of:

A. Down's syndrome

B. Klinefelter's syndrome

C. Thalassaemia

D. Tuner's syndrome

Answer: a

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108. A woman with blood group 'O' has a child with blood group 'O' .If she calims a friends of hers with blood group 'A' as father of the genotype of the father should be :

A. $I^O I^O$

B. $I^B I^B$

C. $I^A I^O$

D. $I^B I^O$

Answer: c

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109. The number of chromosomes in Klinefelter's syndrome is

A. XXX

B. XXY

C. XO

D. XYY

Answer: a

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110. Double lines in a pedigree analysis show:

A. Unaffected offspring

B. Sex unspecified

C. Normal mating

D. Consanguineous marriage

Answer: d

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111. Which of the following conditions correctly describes the manner of determining the sex in a given example

A. Homozygous sex chromosome XX produces male in Drosophila

B. XO type of sex determines male sex in grasshopper.

C. Homozygous sex chromosome ZZ determines female sex in birds.

D. XO condition in human as found in klinefelter's syndrome determines female sex.

Answer: b

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112. Conditions of a karyotype $2n \pm 1$ and $2n \pm 2$ are called

A. Anueploidy

B. Polyploidy

C. Autoployploidy

D. Monosomy

Answer: a

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113. Phenotype of an organism is the result of

A. Environmental changes and sexual dimorphism

B. Cytoplasmic effects and nutrition

C. Mutations and linkage

D. Genotype and environment interactions

Answer: d

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114. Which of the following most appropriately describes haemophilia?

A. Recessive gene disorder

B. X-linked recessive disorder

C. Chromosomal disorder

D. Dominant gene disorder

Answer: c

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115. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 plants were selfed the resulting genotypes were in the ratio of

A. $1:2:1$ tall homoztgous: Tall heterozygous Dwarf

B. $1:2:1$ Tall heterozygous :Tall homozygous: Dwarf

C. $3:1$ Tall : Dwarf

D. $3:1$ :: Dwarf: Tall

Answer: a

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116. Pick out the correct statement

(I) Haemophilia is a sex-linked recessive disease

(II) Down's syndrome is due to aneuploidy

(III) Phenylketonuria is an autosomal recessive gene disorder lt brgt (IV) Sickle-cell anaemia is an X-linked recessive gene disorder

A. (A) and (D) are correct

B. (B) and (D) are correct

C. (A),(C)and (D) are correct

D. (A).(B) and (C)are correct

Answer: d

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117. Which one of the following generates new genetic combinations leading to variations?

A. Sexual reproduction

B. Nuclear polymbryony

C. Vegetative reproduction

D. Parthenogensis

Answer: a

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118. 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

Answer: a

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119. A true breeding plant is

A. Near homozygous and produces offspring of its own kind

B. Always homozygous recessive in its genetic constitution

C. One that is able to breed on its own

D. Produced due to cross-pollination among unrelated plants

Answer: a

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120. If a colourblind man marries a woman who is homozygous for normal colour vision, the probability of their son being colourblind is

A. 0.75

B. 1

C. 0

D. 0.5

Answer: c

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121. In a colour-blind man marries a woman who is parental-type offspring were produced than recombinant-type offspring.this indicates:

A. The two genes are located on two different chromosomes

B. Chromosomes failed to separat during meiosis

C. The two genes are linked and present on the same chromosome

D. Both of the characters are controlled by more than one gene.

Answer: c

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122. Thalassemia and sickle-cell anaemia are caused due to a problem in globin molecule synthesis. Select the correct statement.

A. Both are due to a qualitative defect in globin chain synthesis

B. Thalassaemia is due to less synthesis cell anaemia is due to a quantitative problem of globin molecules

C. Both are due to quantitative defects in globin chain synthesis

D. sickle cell anaemia is due to a quantitative problem of globin molecules

Answer: b

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123. The genotypes of a husband and wife are $I^A I^B$ and $I^A i$. Among the blood types of their children, how many different genotypes and phenotypes are possible?

A. 3 genotype ,4 phenotype

B. 4phenotype,4phenotype

C. 4phenotype,3phenotype

D. 3 genotype,3 phenotypes

Answer: b

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124. A disease caused by an autosomal primary non-disjunction is

A. Klinefelter's syndrome

B. Tuner's syndrome

C. Sickle cell anaemia

D. Down's syndrome

Answer: d

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125. Among the following characters, which one was not considered by Mendel in his experiment on pea

A. Trichomes-glandular on non-glandular

B. Seed-green or yellow

C. Pod-inflated or constricted

D. Stem-tall or dwarf

Answer: a

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126. Which one from those given below is the period of Mendel's hybridisation experiments?

A. 1840-1850

B. 1857-1869

C. 1870-1877

D. 1856-1863

Answer: d

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127. Select the correct match

A. $F_2 \times \text{Recessive parent}$-Dihybrid cross

B. T.H Morgan-Transduction

C. Ribozyme-Nucleic acid

D. Mendel-Transformation

Answer: c

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128. Which of the following pairs is wrongly matched?

A. ABO blood grouping-Co-dominance

B. XO type sex determination-Grasshopper

C. Strach synthesis in pea-Multiple alleles

D. T.H. Morgan-Linkage

Answer: c

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129. Select the correct statement:

A. Punnett square was developed by a British scientist.

B. Spliceosomes take part in translation

C. Franklin Stahl coined the term"linkage".

D. Transduction was discovered by S.Altman.

Answer: a

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130. A woman has an X-linked condition on one of her X chromosomes . This chromosome can be inherited by

A. Only sons

B. Only grandchildren

C. Only daughters

D. Both sons and daughters.

Answer: d

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131. According to Hugo de Vries, the mechanism of evolution is

A. Saltation

B. Phenotypic variations

C. Multiple step mutations

D. Minor mutations

Answer: d

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132. Genetic disorder due to trisomy of chromosome 21 in humans is :

A. Down's syndrome

B. Klinefelter's syndrome

C. Tuner's syndrome

D. None of the above

Answer: a

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Competition File Objective Type Questions Assertion Reaon Type Question

1. Assertion:Over exposure to sun tans the skin in human beings.

Reason:In epidermal cells melanin appear and saves the skin from UV rays of sun.

A. If both Assertion and Reason are true and Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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2. Assertion:Mendel successfully formulated the laws of heredity.

Reason.Mendel did not perform the study of one character at a time.

A. If both Assertion and Reason are true and Reason is a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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3. Assertion:Ratio of complementary genes is 9:7.

Reason.Ratio of supplementary genes is $9:3:4$

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation

of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: B

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4. Assertion:Progeny of pure line is heterozygous.

Reson.It is a dihybrid cross.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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5. Assertion:Progeny of pure line is heterozygous.

Reason.Pure lines are not the progeny of homozygous organisms

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: D

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6. Assertion:The short legged sheep breed true.

Reason.They appeared by mutation in one generation.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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7. Assertion.Extranuclear chromosome are present in mitochondria and plastids.

Reason.They are prochromosomes or organelle chromosomes

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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8. Assertion.Two chromatids remain held together as one point called centromer.

Reason.Chromosome is double at tall points along its length excluding centromere.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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9. Assertion:In eukaryotic chromosome,DNA is a long double stranded and linear.

Reason:The eukaryotic chromosome are composed of DNA ,protiens ,RNA ,metal ions and enzymes.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation

of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: B

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10. Assertion:Human is not suitable for breeding experiments to investigate the human traits.

Reason:X and Y chromosomes differ in form and size.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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11. Assertion:The Y chromosome is called androsome

Reason:X and Y chromosome differ in form and size.

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: B

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12. Assertion:Multiple genes are group of genes located at different loci and involved in the expression of one character they also called cumulative genes.

Reason.Cumulative gene control colour of wheat kernel,skin colour In humans and height in man

A. If both Assertion and Reason are true but Reason is not a correct explanation

of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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13. Assertion : In humans, the gamete contributed by the male determines whether the child produced will be male or female

Reason : Sex in human is a polygenic trait depending upon a cumulative efffect of some genes on X-chromosome and some on Y-chromosome .

A. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion .

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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Chapter Practice Test Section A Multiple Choic Questions

1. Occurance of cell containing mulples of 2n genomes in diploid organisms is known as

A. Aneuploidy

B. Alloploidy

C. Amphiploidy

D. Endopolyploidy

Answer:

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2. Genetics term was proposed by:

A. Mendel

B. Bateson

C. Morgan

D. Johannsen

Answer:

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3. Cross term was proposed by:

A. Mendel

B. Bateson

C. Morgan

D. Johannsen

Answer:

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4. Cytoplasmic inheritance is due to : ltbr . 1. cilia

2. cell wall

3. mitochondria

4. cytoplasmic particles

A. 1,2 and 3 are correct

B. 1 and 2 are correct

C. Cytoplasmic particles

D. Cell wall

Answer:

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5. Which one of the following pairs of features is a good example of polygenic inheritance?

A. Human height and skin colour

B. ABO blood group in humans and flower colour of Mirabilis jalapa

C. hair pigment of mouse and tongue in humans

D. Human eye colour and sickle cell anaemia

Answer:

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6. A normal woman whose father was colour blind is married to a normal man. The sons would be

A. 75% colourblind

B. 50% colourblind

C. All normal

D. All colourblind

Answer:

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Chapter Practice Test Section B Short Answer Type I

1. Define (i)progeny and (ii) pure line

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2. How are alleles of particular gane differ feom each other? Explain its significance.

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3. Discuss the significance of chromosome maps.

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Chapter Practice Test Section C Short Answer Type I

1. Discuss the genetic basis of wrinkled phentype of pea seed.

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Chapter Practice Test Section C Short Answer Type Ii

1. What are the characteristic features of a trur-breeding line?

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2. Can a child have blood group 'O' if his parents have blood group 'A' and 'B' Explain.

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3. Aman with blood groupAmarried a woman With B greup. They have a son withAB blood group and a daughter with blood group O. Work out the cross and show the possibility of such inheritance.

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4. Explain the mechanism of sex determination in man.

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Chapter Practice Test Section E Long Answer Type Question

1. Explain the law of independent assortment.

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