

Section A

- Write the answer of the following questions. [Each carries 1 Mark] [20]
1. Due to the change in DNA characteristic comes into existence.
 2. The branch of science that studies heredity and variation is called
 3. Each trait in human beings is influenced by of father and mother.
 4. The scientist gave laws of heredity.
 5. In the number of chromosomes became normal.
 6. More variations are seen in asexual reproduction.
 7. Mendel studied many opposite traits in gram plants.
 8. In Mendel's experiment, the characteristics of both the parents were found in the ' F1 ' generation.
 9. Sex determination takes place in human beings at the time of formation of zygote.
 10. 't' is a recessive trait that induces height in plants.
 11. It is included in Nucleus.
(A) gene (B) DNA (C) Chromosome (D) all of the above
 12. gave principles of heredity.
(A) Miller (B) Urey (C) Mendel (D) Whitekar
 13. The part of DNA which has information for protein synthesis it is called of protein.
(A) gene (B) chromosome (C) enzyme (D) vitamin
 14. The contribution of is important in determining traits in the progeny.
(A) mother (B) father (C) father-mother (D) protien
 15. The ideas of are necessary for understanding evolution.
(A) heredity (B) genetics (C) (A) and (B) both (D) none of these
 16. How do 'X' and 'Y' chromosomes differ ?
 17. What is meant by characteristic ?
 18. What is meant by gene set ?
 19. Which opposite traits are seen in pea plant ?
 20. What is meant by heredity ?

Section B

- Write the answer of the following questions. [Each carries 2 Marks] [22]
21. The process of sex determination is not inherited.
 22. What is variation ? Give its origin and importance.
 23. Explain accumulation of variation during reproduction with a diagram.
 24. Which is the most important result of reproduction process ?
 25. Outline a project which aims to find the dominant coat colour in dogs.
 26. How is the equal genetic contribution of male and female parents ensured in the progeny ?

27. A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to tell you which of the traits – blood group A or O – is dominant ? Why or why not ?
28. By self-pollination, if tall plants of pea and small plants of pea are crossed, which type of progeny is obtained in F_1 generation ?
29. Explain mechanism of Heredity.
30. Give Difference : Individual / Personal traits and Inherited traits
31. Give Difference : Dominant gene and Recessive gene

Section C

- Write the answer of the following questions. [Each carries 3 Marks]

[6]

32. How traits are inherited in human ?
33. Explain : Genes control the characteristics.

Section D

- Write the answer of the following questions. [Each carries 4 Marks]

[12]

34. Mention the contribution of Mendel in “rules for inheritance.”
35. Explain the inheritance of two traits – colour and shape of the seed with giving chart.
36. What is meant by sex determination ? Explain how is sex of human baby is determined ?

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OPEN STUDENT FOUNDATION**CHAPTER:8****STD 10 : SCIENCE****Date : 26/02/24****IMPORTANT QUESTION DAY 8**

Section [A] : 1 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
1.	-	Chap 8	S4	17	QP23P11B1012_P1C8S4Q17
2.	-	Chap 8	S4	18	QP23P11B1012_P1C8S4Q18
3.	-	Chap 8	S4	4	QP23P11B1012_P1C8S4Q4
4.	-	Chap 8	S4	5	QP23P11B1012_P1C8S4Q5
5.	-	Chap 8	S4	8	QP23P11B1012_P1C8S4Q8
6.	-	Chap 8	S5	2	QP23P11B1012_P1C8S5Q2
7.	-	Chap 8	S5	5	QP23P11B1012_P1C8S5Q5
8.	-	Chap 8	S5	9	QP23P11B1012_P1C8S5Q9
9.	-	Chap 8	S5	11	QP23P11B1012_P1C8S5Q11
10.	-	Chap 8	S5	7	QP23P11B1012_P1C8S5Q7
11.	D	Chap 8	S6	3	QP23P11B1012_P1C8S6Q3
12.	C	Chap 8	S6	10	QP23P11B1012_P1C8S6Q10
13.	A	Chap 8	S6	15	QP23P11B1012_P1C8S6Q15
14.	C	Chap 8	S6	17	QP23P11B1012_P1C8S6Q17
15.	C	Chap 8	S6	24	QP23P11B1012_P1C8S6Q24
16.	-	Chap 8	S7	32	QP23P11B1012_P1C8S7Q32
17.	-	Chap 8	S7	18	QP23P11B1012_P1C8S7Q18
18.	-	Chap 8	S7	7	QP23P11B1012_P1C8S7Q7
19.	-	Chap 8	S7	3	QP23P11B1012_P1C8S7Q3
20.	-	Chap 8	S7	1	QP23P11B1012_P1C8S7Q1

Section [B] : 2 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
21.	-	Chap 8	S1	11	QP23P11B1012_P1C8S1Q11
22.	-	Chap 8	S1	1	QP23P11B1012_P1C8S1Q1
23.	-	Chap 8	S1	2	QP23P11B1012_P1C8S1Q2
24.	-	Chap 8	S1	3	QP23P11B1012_P1C8S1Q3
25.	-	Chap 8	S3	3	QP23P11B1012_P1C8S3Q3
26.	-	Chap 8	S3	4	QP23P11B1012_P1C8S3Q4
27.	-	Chap 8	S8	2.3	QP23P11B1012_P1C8S8Q2.3
28.	-	Chap 8	S2	3	QP23P11B1012_P1C8S2Q3
29.	-	Chap 8	S2	6	QP23P11B1012_P1C8S2Q6

30.	-	Chap 8	S2	8	QP23P11B1012_P1C8S2Q8
31.	-	Chap 8	S2	9	QP23P11B1012_P1C8S2Q9

Section [C] : 3 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
32.	-	Chap 8	S1	9	QP23P11B1012_P1C8S1Q9
33.	-	Chap 8	S1	7	QP23P11B1012_P1C8S1Q7

Section [D] : 4 Marks Questions

No	Ans	Chap	Sec	Que	Universal_Queld
34.	-	Chap 8	S1	5	QP23P11B1012_P1C8S1Q5
35.	-	Chap 8	S1	8	QP23P11B1012_P1C8S1Q8
36.	-	Chap 8	S1	10	QP23P11B1012_P1C8S1Q10

OPEN STUDENT FOUNDATION

CHAPTER:8

STD 10 : SCIENCE IMPORTANT QUESTION DAY 8

Date : 26/02/24

Section A

● Write the answer of the following questions. [Each carries 1 Mark] [20]

1. Due to the change in DNA characteristic comes into existence.
➡ inherited
2. The branch of science that studies heredity and variation is called
➡ genetics
3. Each trait in human beings is influenced by of father and mother.
➡ DNA
4. The scientist gave laws of heredity.
➡ Mendel
5. In the number of chromosomes became normal.
➡ zygote
6. More variations are seen in asexual reproduction.
➡ False
7. Mendel studied many opposite traits in gram plants.
➡ False
8. In Mendel's experiment, the characteristics of both the parents were found in the ' F1' generation.
➡ True
9. Sex determination takes place in human beings at the time of formation of zygote.
➡ True
10. 't' is a recessive trait that induces height in plants.
➡ False
11. It is included in Nucleus.
(A) gene (B) DNA (C) Chromosome (D) all of the above
Ans. (D) all of the above
12. gave principles of heredity.
(A) Miller (B) Urey (C) Mendel (D) Whitekar
Ans. (C) Mendel
13. The part of DNA which has information for protein synthesis it is called of protein.
(A) gene (B) chromosome (C) enzyme (D) vitamin
Ans. (A) gene
14. The contribution of is important in determining traits in the progeny.
(A) mother (B) father (C) father-mother (D) protien
Ans. (C) father-mother
15. The ideas of are necessary for understanding evolution.
(A) heredity (B) genetics (C) (A) and (B) both (D) none of these
Ans. (C) (A) and (B) both

16. How do 'X' and 'Y' chromosomes differ ?

➡ The 'X' chromosome is usually normal in size and the 'Y' chromosome is small in size.

17. What is meant by characteristic ?

➡ Characteristics are details of appearance or behaviour. E.g., humans have four limbs, plants can do photosynthesis.

18. What is meant by gene set ?

➡ In each cell, genes are in pairs. In which one is of mother and other is of father. There are two sets of paired genes.

➡ At the time of formation of germ cells, genes are split so there is only one set in it. In short it is unpaired gene.

19. Which opposite traits are seen in pea plant ?

➡ In pea plant, opposite traits like,

- tall plant – short plant
- round seed – wrinkled seed
- white flower – purple flower are seen

20. What is meant by heredity ?

➡ The traits of parents transmitted in children is called heredity.

Section B

● Write the answer of the following questions. [Each carries 2 Marks]

[22]

21. The process of sex determination is not inherited.

➡ Some organisms rely on environmental cues in sex determination.

➡ Some animals depend on decrease or increase in temperature for sex determination of fertilised ovum.

➡ Female snail like organisms can change their sex.

➡ Thus it can be said that the process of sex determination is not inherited.

22. What is variation ? Give its origin and importance.

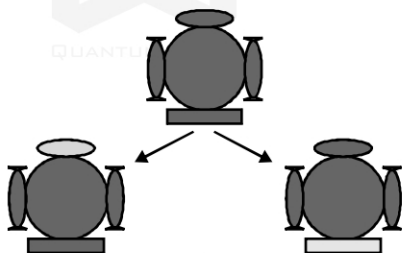
➡ During sexual reproduction, mostly variation is seen in characters of new generation. New characteristics are seen in off springs than parents.

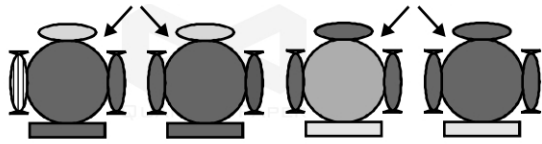
➡ Due to variations, living organism adapt with the environment.

➡ There is a large contribution of variation in evolution.

23. Explain accumulation of variation during reproduction with a diagram.

➡ Inheritance from the previous generation provides a common basic body design and subtle changes in it.





Creation of diversity over succeeding generations. The original organism at the top will give rise to, say, two individuals, similar in body design, but with subtle differences. Each of them, in turn, will give rise to two individuals in the next generation. Each of the four individuals in the bottom row will be different from each other. While some of these differences will be unique, others will be inherited from their respective parents, who were different from each other.

- ➡ The second generation will have differences that they inherit it from the first generation.
 - ➡ Thus generation by generation variations are accumulated and diverse characteristics are shown.
 - ➡ In asexual reproduction, one bacterium divides and then the resultant two bacteria divide again, the four individual bacteria generated would be very similar.
 - ➡ There would only very minor differences between them, generated due to small inaccuracies in DNA copying.
 - ➡ Thus it can be said that new generation is similar to parent during asexual reproduction. No variation is seen in it.
 - ➡ Living organisms change their traits/ characteristics to with the environment. These traits transmit generation by generation and therefore offsprings/new generation sustain in the environment.
 - ➡ E.g., Bacteria that can withstand heat will survive better in a heat wave.
 - ➡ Thus due to variation, existence of living organisms is maintained.
 - ➡ Variation or diversity is created in succeeding generations.
 - ➡ Two different individuals similar in body-design but with subtle differences. Each of them, in turn will give rise to two individuals in the next generation.
 - ➡ As per shown in figure, each of the four individuals in the bottom row will be different from each other. While some of these differences will be unique.
 - ➡ Therefore variations are inheritant which are seen in new generation and new generation individuals are different from each other.
24. Which is the most important result of reproduction process ?
- ➡ The most obvious outcome of the reproductive process still remains the generation of individuals of similar design.
 - ➡ Transmition of traits of parents is dependent on rules of inheritance. Characteristics are inherited from generation to generation.
25. Outline a project which aims to find the dominant coat colour in dogs.
- ➡ Dominant gene WW (White colour)
 - ➡ Recessive gene ww (Black colour)

Black colour

White colour

	w	w
W	Ww	Ww
W	Ww	Ww

- ➡ In F_1 generation all dogs are seen in white colour.
- ➡ Now getting self fertilization done among dogs of F_1 generation.

Ww male Ww female

	W	w
W	WW	Ww
w	Ww	ww

- ➡ Thus in F_2 generation,

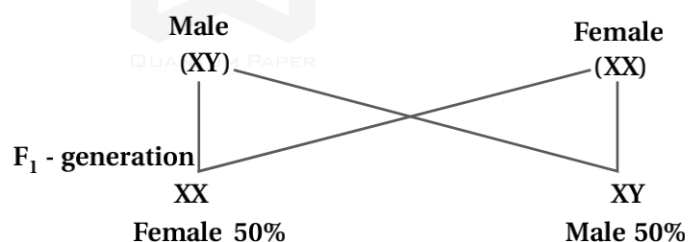
$\left. \begin{array}{l} WW \\ Ww \\ Ww \end{array} \right\}$ White coloured dogs take birth.

ww – black coloured dogs are born.

Hence, 3:1 ratio can be seen.

26. How is the equal genetic contribution of male and female parents ensured in the progeny ?

- ➡ Offsprings / new generation formed by combination of genes of both parents in which the contribution of both are same.



27. A man with blood group A marries a woman with blood group O and their daughter has blood group O. Is this information enough to tell you which of the traits – blood group A or O – is dominant ? Why or why not ?

- ➡ From above information it is not specified that blood group A or O is having dominant traits or not. In blood inheritance A blood group is always seen dominant and O blood group is always seen recessive.
- ➡ Here blood group of father can be $[A]^A$ or $[A]$. While genetically ii genes can be present in mother.
- ➡ Daughter's blood group is O. So one-one gene is transmitted from father-mother to daughter mother (ii) with equal gene constitution receives (i) from it. She receive (i) from father's gene constitution $[A]$. Thus it can be possible if father's gene constitution is mismatched.
- ➡ Thus the blood group of father of daughter should be $[A]$ and of mother should be (ii).

28. By self-pollination, if tall plants of pea and small plants of pea are crossed, which type of progeny is obtained in F_1 generation ?

- ➡ Tall plants Short plant

Parents :

Reproductive cells



- TT } Tall plant
- Tt } Tall plant
- Tt } Tall plant
- tt } Short plant

Progeny is obtained in 3 : 1 ratio.

	T	t
T	TT	Tt
t	Tt	tt

29. Explain mechanism of Heredity.

- Cellular DNA is the information source for making proteins in the cell. A section of DNA that provides information for one protein is called the gene for that protein.
- Genes have information in code language as per that new protein is synthesized and newly formed protein forms different characteristics.
- Plants have hormones that can trigger growth plant height can thus depend on the amount of a particular plant hormone.
- Hormones are controlled by enzymes. If enzyme works efficiently a lot of hormone will be made and the plant will be tall.
- Hence the mechanism goes on and on continuously.

30. Give Difference : Individual / Personal traits and Inherited traits

Individual / Personal traits	Inherited traits
(1) These traits cannot change in DNA.	(1) These traits induce change in DNA.
(2) They are not directly associated with evolution.	(2) They are associated with evolution.
(3) Traits are not transmitted from generation to generation.	(3) Traits are transmitted from generation to generation.

31. Give Difference : Dominant gene and Recessive gene

Dominant gene	Recessive gene
(1) It is seen during breeding between two sexes in F_1 generation.	(1) Traits of these genes are never seen in F_1 generation.
(2) It inspires traits in large number.	(2) Traits are seen in least number.

Section C

● Write the answer of the following questions. [Each carries 3 Marks]

[6]

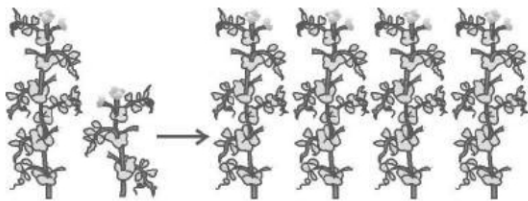
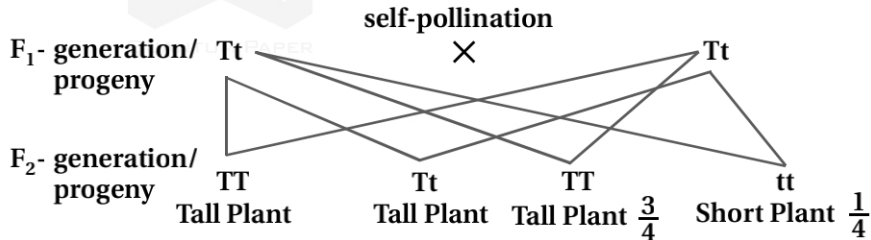
32. How traits are inherited in human ?

- During sexual reproduction produced progeny shows mixture of DNA of both parents.
- Thus both parents do help in determining traits of progeny.
- Thus in pair of genes, one gene from father, other gene from mother collectively form pair of genes.

progeny... TT Tt Tt Tt

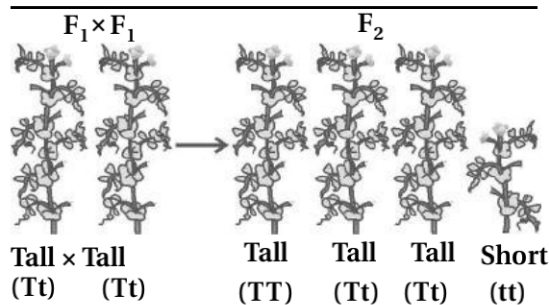
All children were seen tall

- Now by self pollination of plants of F₁ progeny, all plants were not seen tall in next progeny F₂. One quarter were short plants.
- Above results show that,
 - Tallness and shortness traits were transmitted by plants of F₁ progeny. But only trait of tallness was expressed.



Tall × Short All tall offspring

(TT) (tt) (Tt)



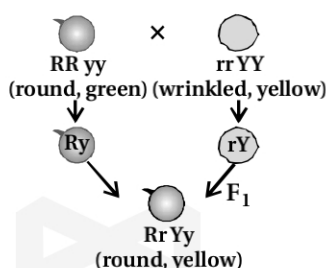
Inheritance of traits over two generations

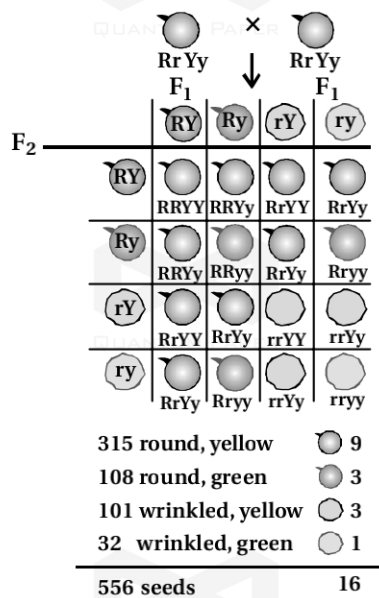
- Individuals produced by either cross pollination/breeding or sexual reproduction have two forms of any trait which can be same or different. That transmits in heredity.
 - Inheritance of traits depend on parents.
- It is proved from above experiment of Mendel that progeny produced by crossing tall plants and short plants are all tall only. Thus only one of the parental traits are seen, not mixture or mixed effect of traits is seen.

35. Explain the inheritance of two traits – colour and shape of the seed with giving chart.

- Mendel had explained heredity in pea plant seed. Pea plants were bred in such a way that yellow and wrinkled seed and green and round seed with each other.

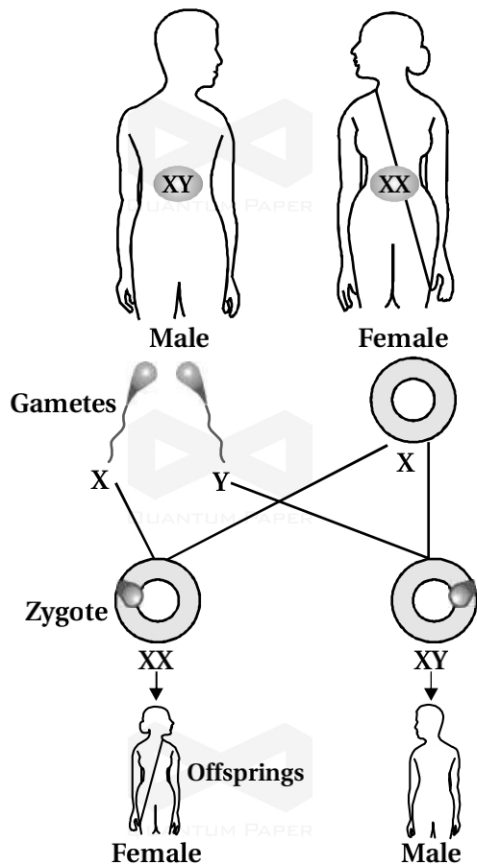
For answer see Section-1 Q. no. 10





Independent inheritance of two separate traits, shape and colour of seeds

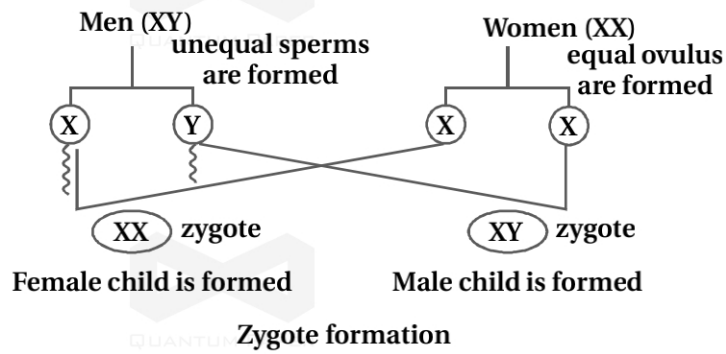
36. What is meant by sex determination ? Explain how is sex of human baby is determined ?
- ➡ Sex determination is a system which decides the sex of an offspring or a foetus.
 - ➡ In human beings, the sex of the individual is largely genetically determined. Means the genes inherited from our parents decide whether we will be boys or girls.
 - ➡ Most human chromosomes have a maternal and a paternal copy. They are called autosomes. They are 22 in pairs.



Sex determination in human beings

- ➡ In human beings women have 23rd pair of chromosomes as sex chromosomes. That is XX. It is called perfect pair of sex chromosomes.

- Men have a mismatched pair in which one is normal sized X while the other is a short one called Y. That is XY.



- Thus sex determination is dependent on what offspring / children inherit from their father.
- Ovum having equal number of chromosomes are formed from women.
- Thus zygote (XY) is formed by fertilization of ovum (X) with sperm (Y) which results in male child zygote (XY). While zygote (XX) is formed by fertilization of ovum (X) with sperm (X). Which results in a female child zygote (XX).
- Thus sex determination takes place in human beings at the time of formation of zygote.