Sheet # _____

LGS GROUP OF COLLEGES
A PROJECT OF LAHORE GRAMMAR SCHOOL

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Subject: Biology Test No. WT-8 Assignment Date: 23/11/24

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1	○	○	●	○	6	○	○	○	○	11	○	○	○	○	16	○	○	○	○
2	●	○	○	○	7	○	○	○	○	12	○	○	○	○	17	○	○	○	○
3	○	●	○	○	8	○	○	○	○	13	○	○	○	○	18	○	○	○	○
4	○	○	●	○	9	○	○	○	○	14	○	○	○	○	19	○	○	○	○
5	○	○	○	●	10	○	○	○	○	15	○	○	○	○	20	○	○	○	○

Marks Obtained

Subjective Part

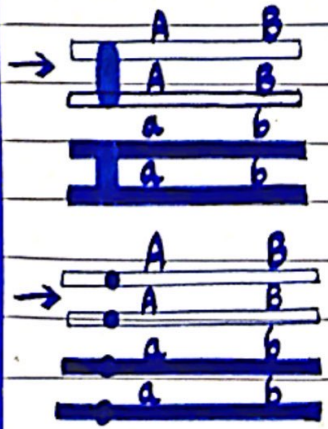
(Question#2)

(Short Questions)

(i)

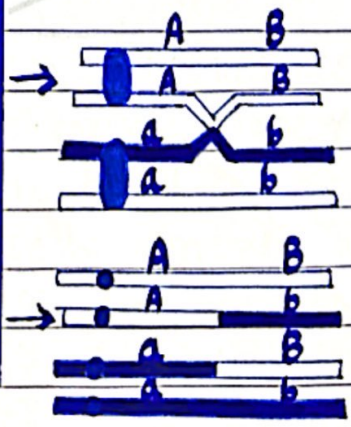
Parental combinations

→ The combinations of alleles that are inherited unchanged from the parents, with no crossing over or recombination is called parental combinations.



Non-parental combinations

→ The new combinations of alleles that result from crossing over during meiosis are called recombinant or non-parental combinations.



(ii)

Epistasis

→ When an effect caused by a gene or gene pair at one locus interferes with or hides the effect caused by another gene or gene pair at another Locus, such a phenomenon of gene interaction is called Epistasis.

→ **E.g:** Bombay phenotype.

Pleiotropy

→ When a single gene affects two or more traits, the phenomenon is called Pleiotropy.

→ **E.g:** White eye gene in Drosophila also effects the shape of sperms storing organs.

(iii)

Polygenic traits & polygenes

A continuously varying trait is encoded by alleles of two or more different gene pairs found at different loci, all influencing the same trait in an additive way. These quantitative traits are called **polygenic traits.**

→ And their genes are called **polygenes.**

Long Question

Erythroblastosis Foetalis

Maternal-foetal Rh incompatibility:

Maternal-foetal incompatibility results when an Rh^- woman, married to an Rh^+ man **conceives** a child who is Rh^+.

Chances:

→ If the man's genotype is **DD**, all of their offsprings (Dd) will be Rh^+.
→ If the man's genotype is Dd, half of their offspring with Dd genotype will be Rh^+.

RBCs of Rh^+ foetus:

If RBC of Rh^+ foetus cross the placental barrier and enter into Rh^- mother's blood stream, the mother's immune system reacts to the foetal Rh antigen stimulus by producing a large number of anti-Rh antibodies.

Mother's anti-Rh antibodies:

When mother's anti-Rh antibodies seep through placenta into blood circulation of foetus, they start **hemolysis** (breakdown/bursting) of RBC of foetus.

Erythroblastosis foetalis:

As this destruction continues, the foetus becomes anaemic. The anaemic foetus starts to release many **immature erythroblasts** into his blood streams. That is why this hemolytic disease of the newborn is called erythroblastosis foetalis.

→ This anaemia, **may** lead to **abortion** or still birth.

Continual of pregnancy:

→ Even if pregnancy continues, the liver and spleen of the foetus swell as they rapidly produce RBC.

→ The breakdown product of RBC called **bilirubin** also accumulates in the foetus. Bilirubin damages his brain cells and turns his skin and whites of eye yellow. This condition is called **Jaundice.**

→ So, the baby, if born alive, suffer from severe hemolytic anaemia and jaundice.

Rh^- blood free of anti Rh-antibodies:

Such baby's blood should be immediately replaced by Rh^- blood free of anti Rh- antibodies.

First pregnancy:

The first Rh incompatible pregnancy may not face much problems if very few of foetal antigens cross placenta into maternal circulation and the amount of maternal antibody production is not very high.

Foetal cells enter mother's blood stream:

→ When placenta detaches at birth, a large number of foetal cells enter mother's blood stream and stimulate production of large amount of anti Rh antibodies by the mother.

→ These anti-Rh antibodies persist in mother's blood for a long time and are persistent risk for next Rh^+ foetus.

Avoidance of Rh sensitization: It is avoided by a simple therapy. She is given an injection of Rh antiserum during early pregnancy and immediately after birth.

Rh antibodies: Rh-antibodies in Rh antiserum will destroy Rh^+ RBC of the foetus before they stimulate production of maternal anti-Rh antibodies. The injected antiserum disappears before next pregnancy.