Class-12th- Test

PRINCIPLE OF INH.& VARIATION + MOL.BASIS OF INH.

M.M-35 **TIME-1.5 HR**

SECTION A

Multiple Choice Questions **[1X 10=10]**

1. A colour blind person cannot distinguish

A. Red and green B. Green and blue C. Yellow and white D. Black and yellow

2. Trisomy has chromosome complement of

A. 2n – 1 B. 2n – 1 – 1 C. 2n + 1 + 1 D. 2n + 1

3. "A disease which shows its transmission from unaffected carrier female to some of the male progeny". Find the nature of the trait.

A. Autosomal recessive B. Autosomal dominant

C. Sex-linked recessive D. Sex-linked dominant.

4. Which is incorrect about thalassemia?

A. This blood disease is transmitted from parents to the offspring when both the partners are unaffected carrier for the gene (or heterozygous).

B. The defect is due to either mutation or deletion which ultimately results in reduced rate of synthesis of one of the globin chains that make up haemoglobin.

C. This causes the formation of abnormal haemoglobin molecule resulting into anaemia which is characteristic of the disease.

D. Thalassemia differs from sickle cell anaemia in that the former is a qualitative problem of synthesizing an incorrectly functioning globin while the latter is a quantitative problem of synthesising too few globin molecules.

5. **Statement I** : Starch synthesis in pea seeds is controlled by one gene.
Statement II : Starch synthesis gene in pea plants has two alleles (B and b).

(A) Both statements I and II are correct and II explains I

(B) Both statements l and II are correct and II does not explain I

(C) Statement I is true and statement II is false

(D) Both statements I and II are false

6. Match the columns I and II, and choose the correct combination from the options given.

	Column I		**Column II**
a.	Bacteriophage Lambda	i.	5386 nucleotides

b.	Bacteriophage Ø x 174	ii.	48502 bp
c.	Escherichia coli	iii.	4.6×10^6 bp
d.	Homo sapiens	iv.	6.6×10^9 bp

Select the correct matching:

	a	b	c	d
A.	i	ii	iii	iv
B.	ii	i	iii	iv
C.	i	ii	iv	iii
D.	ii	i	iv	iii

7. 5-methyl uracil is

A. Another name of thymine B. A purine base

C. A double ring structure D. Both A and C

8. Stability as one of the properties of genetic material was very evident in

A. Griffith's transforming principle

B. Hershey and Chase experiment

C. Messelson and Sthal's centrifugation technique

D. Taylor's experiment

9. Read (i) to (v) and find the appropriate option.

(i) Nitrogen base is linked to OH of 1'C pentose sugar through N-glycosidic linkage.

(ii) Phosphate group is linked to OH of 5'C of a nucleoside through phosphoester linkage.

(iii) Two nucleosides are linked through 3'- 5' N-glycosidic linkage.

(iv) Negatively charged DNA is wrapped around positively charged histone octamer to form nucleosome

(v) Chromatin that is more densely packed and stains dark is called euchromatin.

A. i and ii are wrong B. iv along is wrong

C. iii and v are wrong D. i alone is wrong

10. Condensation product of adenine, ribose and phosphoric acid is

A. Adenylic acid B. Adenine phosphate

C. Adenosine D. None of the above

SECTION – B [2X3= 6]

11. Define polygenic inheritance with e.g.

12. Explain sex determination in honey bee.

13. Who worked on to determine the biochemical nature of 'transforming principle' ? How they proved DNA causes transformation ?

SECTION-C [3X 3= 9]

14. "Dominance is not autonomous feature of a gene or the product it has information for.It depends as much on gene product & the production of a particular phenotype from this product as it does on particular phenotype that we choose to examine." Justify the statement.

15. "There is now enough evidences to suggest that essential life evolved around RNA which shows the dominance of RNA-world." Explain it supporting your answer with e.gs.

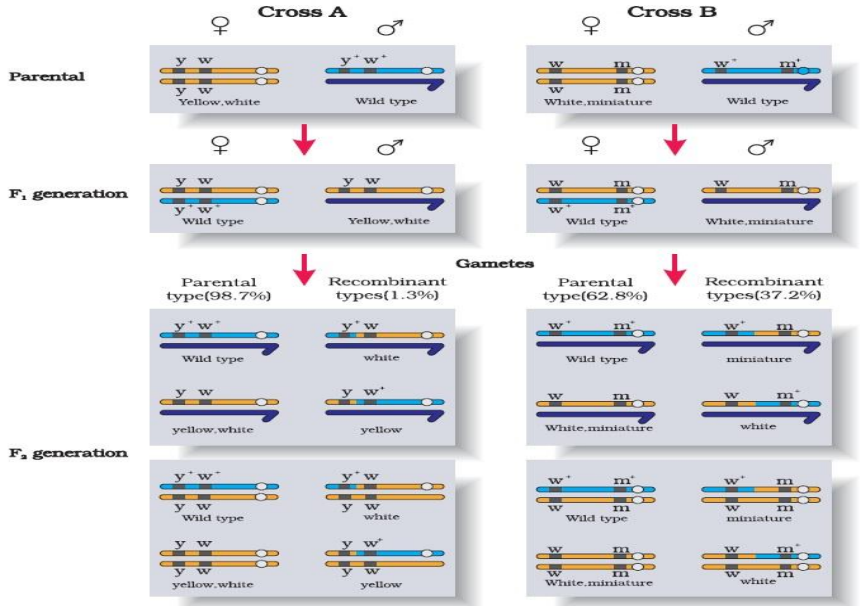
16. Write about the PKU disorder in details.

SECTION-D [5X1= 5]

17. (i) Who proposed the DNA double helix model ? Write the salient features of it. **[3]**
(ii) Explain packaging of DNA helix. **[2]**

CASE STUDY [1X5= 5]

18. During a study on the inheritance of two genes, the teacher asked students to perform an experiment. The students crossed white-eyed, yellow-bodied female Drosophila with a red-eyed, brown-bodied male Drosophila (i.e., wild). They observed that progenies in the F2 generation had 1.3 percent recombinants and 98.7 percent parental type combinations. The experimental cross with results is shown in the given figure.



(i) By conducting the given experiment, the teacher can conclude that
A. Genes for eye color and body color are linked
B. Genes for eye color and body color show complete linkage
C. Linked genes remain together and are inherited

(a) A and B only	(b) B only	(c) A and C only	(d) A, Band C

(ii) Teacher asked to conduct an experiment on Drosophila because

(a) the male and female flies are easily distinguishable	(b) it completes its life cycle in about two weeks
(c) a single mating could produce a large number of progeny flies	(d) all of these.

(iii) Genes white-eyed and yellow-bodied located very close to one another on the same chromosome tend to be transmitted together and are called

(a) allelomorphs	(b) identical genes	(c) linked genes	(d) recessive genes

(iv) Select the correct statement regarding the given experiment.

(a) The physical distance between two genes determines the strength of linkage
(b) The physical distance between two genes determines the frequency of crossing over
(c) The two linked genes always segregate independently of each other
(d) Both (a) and (b)

(v) Assertion: When yellow-bodied, white-eyed Drosophila females were hybridized with brown-bodied, red-eyed males; and FI progeny was intercrossed, the F2 ratio deviated from 9: 3: 3: 1.
Reason: When two genes in a dihybrid are on the same chromosome, the proportion of parental gene combinations is much higher than in the non-parental type.

(a) Both assertion and reason are true and the reason is the correct explanation of assertion.