

T.I.SCHOOL, AMBATTUR, CHENNAI

QUARTERLY EXAMINATION

SUBJECT: BIOLOGY

Duration: 2hrs

Marks: 50

XII

PART A –BIO-BOTANY

I) Choose the correct answer: 5x1=5

1. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F<sub>2</sub> generation of the cross RRY<sup>Y</sup> X rryy? **A02**

- a) Only round seeds with green cotyledons.
- b) Only wrinkled seeds with yellow cotyledons.
- c) Only wrinkled seeds with green cotyledons.
- d) Round seeds with yellow cotyledons and wrinkled seeds with yellow cotyledons.

2. In a test cross involving F<sub>1</sub> dihybrid flies, more parental type offspring were produced than the recombinant type offspring. This indicates **A02**

- a) The two genes are located on two different chromosomes.
- b) Chromosomes failed to separate 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.

3. The A and B genes are 10 cM apart on a chromosome. If an AB/ab heterozygote is test crossed to ab/ab, how many of each progeny class would you expect out of 100 total progenies? **A03**

- a) 25AB, 25ab, 25Ab, 25 aB
- b) 10 AB, 10 ab
- c) 45 AB, 45 ab
- d) 45 AB, 45 ab, 5 Ab, 5aB

4. Genes G S L H are located on the same chromosome. The recombination percentage between L and G is 15%, S and L is 50%, H and S are 20%. The correct order of genes is **A03**

a) GHSL b) SHGL c) SGHL d) HSLG

5. The point mutation sequence for transition, transition, transversion and transversion in DNA are: **A03**

a) A to T, T to A, C to G and G to C

b) A to G, C to T, C to G and T to A

c) C to G, A to G, T to A and G to A

d) G to C, A to T, T to A and C to G

**II) Answer any three of the following questions in one or two sentences each: 3x2=6**

6. Define Pleiotropy. A01

7. What is polygenic inheritance? A01

8. Explain synapsis. A01

9. Explain back cross. A01

10. What is genetic mapping? A01

**III) Answer any three of the following questions in brief. Question No. 12 is compulsory. 3x3=9**

11. Distinguish between autopolyploidy and allopolyploidy. A03

12. Write any three uses of genetic mapping. A01

13. What is meant by extra chromosomal inheritance? A01

14. Distinguish between population genetics and quantitative genetics. A03

15. What is the difference between Missense mutation and Nonsense mutation? A03

**IV) Answer the following question in detail: 1x5=5**

16. a) Explain the mechanism of crossing over. A01

OR

b) What is the molecular explanation for Mendel's tall and dwarf plants? A01

HOTS

3/35

10%.