

BA SANGAM COLLEGE

YEAR 13

BIOLOGY

WORKSHEET 1

2021

Instructions:

Students/Parents are requested to use this as a supplementary activity during extended holidays. Students can simply answer the questions in their respective subject books (from the back) after downloading this document. Also requested to complete paper correction at the back of exercise book and write all the long and short essays that are in the Term 1 Paper.

Strand 1

1. Read the following extract and answer the questions that follow.

“Letting the gene out of the bag – and into the environment”

It is important to remember that genetically engineered organisms are living things. From carefully controlled laboratory conditions, a new modified organism is developed, released into the environment and cannot be recalled. It is impossible to predict the results of contact with other organisms.

- (i) State the term used to describe the type of organisms produced above.
- (ii) Suggest **three** risks of producing genetically engineered organisms.

2. A recombinant plasmid is produced by DNA recombinant technology.

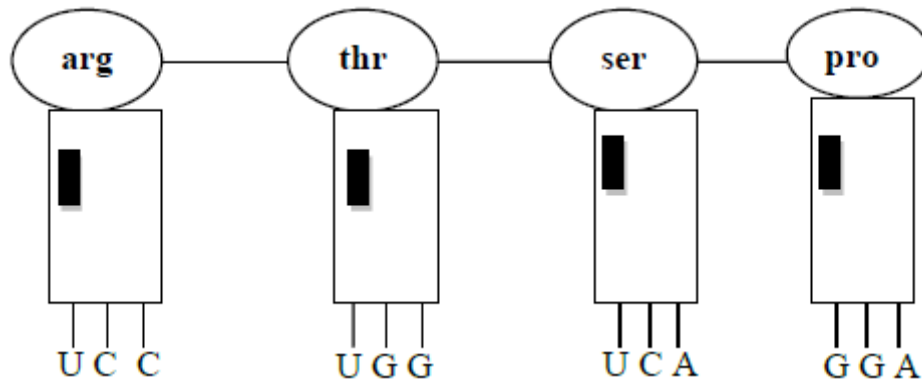
- (i) Describe DNA recombinant technology by the restriction enzyme method in **two** simple steps
- (ii) What is the significance of the plasmid to the above technique?

3. “Aneuploidy and polyploidy are the results of the non-disjunction of chromosomes during meiosis.”

- (i) State **four** reasons to support the above statement.
- (ii) Suggest **two** reasons why polyploidy is more common in plants than in animals.

4. The following diagram shows four molecules of tRNA during the process of protein production. (**arg** = arginine, **thr** = threonine, **ser** = serine, **pro** = proline)

- (i) Write the **three** base sequence on a DNA molecule which codes for serine.
- (ii) What would be the next amino acid in this protein if the next mRNA codon was AGG?
- (iii) If arginine (**arg**) was the second amino acid in the protein chain, name the amino acid that would precede it.



5. Discuss **two** ways in which the process of DNA Replication ensures that each daughter cell receives a complete set of DNA.

6. Sheep produce extra wool before winter and shed the extra wool after winter.

- (i) Why is this behaviour an exogenous clock?
- (ii) Explain how the change stated helps the animal to survive.

7. Suggest why organisms that show territorial behaviour defend their territories.

8. Thalassaemia is a hereditary disease characterised by reduced rate of haemoglobin production resulting in severe anaemia. It is produced when an individual is homozygous for an autosomal recessive gene and usually the individual dies in early childhood. The result of a research showed that 1 in 3 600 individuals in a local area are affected by this disorder.

- (i) Calculate the frequency of this recessive allele in the human population of this local area.
- (ii) A child who is homozygous recessive for this allele often dies at the age of six.

Does this mean that the recessive allele will, in a few more generations, be removed from the population? Explain your answer.

9. In a population of 800, approximately 16% of persons have ear lobes attached to the side of the face (recessive phenotype).

- (i) Calculate the frequency of the dominant allele.
- (ii) What is the likelihood of an individual carrying a recessive allele ?
- (iii) How many persons in the population are heterozygous ?