Bonus Assignment

Submitted to :

Name : Sarah Umaymah Mahdiyah

Department : Department of Mathematics and Natural Sciences

Submitted by :

Name : Tasnim Rahman Moumita

ID : 22301689

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Ans. to the Question NO- 1(a)

The process that is seen on the given picture is called 'DNA Transcription.'

Ans. to the Question NO- 1(b)

DNA transcription is the procedure by which RNA polymerase rewrites the genetic information included in DNA into messenger RNA (mRNA).

DNA transcription is mainly divided into three stages :-

i) Initiation :

The enzyme RNA polymerase, which links to and goes along the DNA molecule until it recognizes a 'promoter' sequence, catalyzes transcription. This happens in the first stage, called initiation. Proteins are called transcription factors, which

also link to the promoter sequences with RNA polymerase and control the rate of DNA transcription.

When RNA polymerase attaches to the promoter site, it slightly unfolds the DNA double helix to disclose the bases on every one of the two DNA strands.

ii) RNA Elongation :

During the second phase of transcription, RNA starts to grow longer. The prototype for the new mRNA molecule is provided by one DNA strand (the template strand), which is read in the 3' to 5' direction.

Incoming ribonucleotides are used by RNA polymerase to create the new mRNA strand. By employing complementary base pairing, it facilitates the creation of phosphodiester linkages between neighboring ribonucleotides.

iii) Termination :

It is the third and final stage of DNA transcription. Untill the RNA polymerase comes accross a stop sequence ; called 'terminator'; elongation continues. Terminator is the signal that indicates the end. In this phase, the RNA polymerase exits the DNA prototype, and the transcription process comes to an end.

This is how the DNA transcription procedure functions.

Ans. to the Question NO - 2 (a)

The type of mutation seen in the given picture is called Base substitution mutation.

A disease named 'Sickle-cell anemia' is caused due to base substitution mutation.

Ans. to the Question NO - 2 (b)

Anything in the environment that can cause a mutation is known as mutagen.

Some of the causes of mutation are stated below:-

→ Physical and chemical agents :-

i) UV (ultra violet) radiation
ii) X-ray
iii) Cigarette smoke
iv) Nitrate and nitrite preservatives
v) Extrem heat
vi) Viral DNA (e.g. Rous sarcoma) or bacteria (e.g. HPV)

Ans. to the Question No. - 3(a)

No.	DNA	RNA
01.	DNA → Deoxyribo-nucleic Acid.	RNA → Ribonucleic Acid.
02.	A double - stranded molecule that is made up of an extensive chain of nucleotides.	A single - stranded helix that consists of shorter chains of nucleotides.
03.	DNA is present in the nucleus of a cell and in mitochondria.	RNA is present in a cell's nucleus, cytoplasm, and ribosome depending on the type of RNA.
04.	Purine and Pyrimidine bases are equal in number.	The ratio of purine bases to pyrimidine bases is not proportional.

Ans. to the Question No.- 3(b)

No.	Bacteria	Virus
01.	Bacteria are totally present as living in nature.	Viruses are present in both living and non-living form.
02.	Bacteria reproduce mainly by binary fission.	Viruses reproduce by lytic fission and produce their duplicates.
03.	Antibiotics are effective for bacterial infections.	Antivirals are effective for viral infection.
04.	Bacteria causes disease like : food poisoning, ulcers, pneumonia, etc.	Virus causes infection like : AIDS, common cold, chickenpox etc.

Reference

1. www.vedantu.com

2. www.britannica.com

3. www.microbiologyinfo.com