

SUB-TOPIC: DNA REPLICATION
SET-1-QP-1

1 (a) Describe the process of DNA replication.

.....

[illegible]

.....[1]

(c) During DNA replication, the use of an incorrect base in the newly synthesised strand can lead to a mutation.

- (i) A transversion event is where a pyrimidine is used in the newly synthesised strand instead of a purine, or the other way round.

Name the **two** possible bases that could be used instead of cytosine in a transversion event.

.....[1]

- (ii) A transition event is where an incorrect purine is used or an incorrect pyrimidine is used.

Suggest why transversion events are **less** likely to occur than transition events.

.....
.....
.....[2]

MARK SCHEME:

(a)	<p>1 DNA (double helix) unwinds ; A uncoils / unzips R DNA strand unwinds</p> <p>2 hydrogen bonds break between, base pairs / bases / strands ;</p> <p>3 both strands used as templates ;</p> <p>4 catalysed by / AW, DNA polymerase ;</p> <p>5 <i>ref. to (free) activated nucleotides / AW ;</i></p> <p>6 complementary (DNA) nucleotides added ; R RNA nucleotides A described in terms of complementary base pairing</p> <p>7 step-by-step / sequentially / AW ;</p> <p>8 <i>idea that</i> process continues, along whole DNA molecule ;</p> <p>9 replication bubbles / described or <i>ref. to</i> Okazaki fragments ;</p> <p>10 replication is semi-conservative / each newly formed molecule contains one original and one newly synthesised strand</p> <p>11 AVP ; e.g. <i>ref. to</i> repair / proofreading <i>ref. to, helicase / ligase in correct context</i></p>	max 5
(b)	telomere(s) ;	1
(c)(i)	adenine <u>and</u> guanine ;	1
(c)(ii)	<p><i>idea that</i> purines and pyrimidines are different sizes / two rings and one ring ;</p> <p>purine normally bonds with pyrimidine (to maintain DNA double strand width) ;</p> <p><i>idea that</i> two purines or two pyrimidines will distort the double helix width (in a transversion event) ; ora</p> <p>AVP ; e.g. (transversion event) more likely to be detected by the repair mechanism ora</p>	max 2