Practice Question Set For A-Level
Subject : Biology
Paper-2 Topic: 8 The control of gene expressions

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) (i) Different genes / characteristics / features;
Reference to mutations;
Or
Base sequence determines protein;
Different species have different protein sequences;

max 2

(ii) Primer has different DNA sequence;
DNA specific / complementary base-pairing;

2

(iii) Electrophoresis separates DNA;
(So they can be) identified by position on gel;
Smaller / shortest fragments travel furthest / quicker / or reverse argument;

3

(b) (*conventional*) Many lengths / all DNA / (*new*) one length;
Each rung is DNA of one / specific length;

2

(c) 1 Heat DNA;
2 Breaks hydrogen bonds / separates strands;
3 Add primers;
4 Add nucleotides;
5 Cool;
6 (to allow) binding of nucleotides / primers;
7 DNA polymerase;
8 Role of (DNA) polymerase;
9 Repeat cycle many times;

max 6

[15]

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Q2.

(a) Cytosine with Guanine and (Adenine) with Uracil;

Ignore G, C and U

1

(b) Two reasons, with suitable amplification;;

Q

Only infected cells have HIV protein on surface;

So carrier only attaches to / specific to these cells / siRNA can only enter these cells;

OR

siRNA (base sequence) complementary / specific to one mRNA;

Accept idea of specificity

Only infected cells contain mRNA of HIV / this gene / stops translation of this gene / only binds to this mRNA / destroys this mRNA;

Accept could not inhibit other / non-HIV mRNA

4 max

(c) 1. Carrier binds to (protein on) HIV;

1. Accept references to HIV membrane

2. Prevents HIV / it binding to (receptor on human) cell;

2. Reject references to binding to HIV protein on human cell

2

[7]

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