Name of the Student:_____
Max. Marks : 24 Marks **Time : 24 Minutes**

Mark Schemes

Q1.

(a) (i) Does not code for amino acid/tRNA/rRNA;
Accept 'does not code for production of protein/polypeptide'
Reject 'that produces/makes amino acid'
1

(ii) Deletion mutation;
Accept 'deletion'
Ignore references to splicing
1

(b) (The) polymerase chain reaction;
Accept PCR
1

(c) 1. Probes are single stranded / have a specific base sequence;
2. Complementary base sequence on (specific) spacer

OR

3. Complementary/specific to (particular) spacer;
4. (In white squares probe) binds (to single-stranded spacer) and glows/produces light/fluoresce;
2. Need idea of complementary to spacer
3. Accept converse for dark squares
3

(d) 1. To see if strain is resistant to any antibiotics;
2. So can prescribe effective/right antibiotic;
OR
3. To see whether (any) vaccine works against this strain/ see which vaccine to use/ to produce specific vaccine;
4. (So) can vaccinate potential contacts/to stop spread;
OR
5. Can test other people to see if they have the same strain/ to trace where people caught TB;
6. Allowing control of spread of disease/vaccinate/treat contacts (of people with same strain) before they get TB;
Do not allow mix and match of points from different alternative pairs
2 max

[8]

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Q2.

(a) 1. To allow comparison;

2. Because different number of cells in samples / different times for incubation / numbers become easier to manipulate;

2

(b) 203.7(%);;

Allow 1 mark for 21.8 / 10.7

Allow 1 mark for correct answer (203.74) but not correctly to 1 dp

204 = 1 mark

2

(c) (i) 1. (At every concentration) uptake is faster at 37°C / at higher temperature;

2. Due to faster respiration / ATP production;

2

(ii) 1. Uptake at 37°C only small increase / levelling off / almost constant as carrier proteins full;

Accept 'no (significant) change'

Ignore use of numbers

2. Concentration of imatinib is not the limiting factor;

2

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Q3.

(a) 1. Carriers are heterozygous / have one normal copy and one mutant copy of gene / have one recessive allele / don't have the condition;

2. Both have DNA that binds (about) half / 50% amount of probe (that non-carrier does);

3. Probe binds to dominant / healthy allele so only one copy of exon in their DNA / have one copy of gene without exon / base sequence for probe to bind to;

3. Accept normal and gene

3. Accept have a deletion mutation

3

(b) 1. Introns not translated / not in mRNA / (exons) code for amino acids / introns do not code for amino acids;

1. Accept not expressed

1. Accept polypeptide / protein for amino acids

2. Mutations of these (exons) affect amino acid sequences (that produce) faulty protein / change tertiary structure of protein;

2. Accept deletion leads to frameshift

2. In this context, accept affects protein made

3. So important to know if parents' exons affected, rather than any other part of DNA / introns;

Accept converse arguments involving - eg introns do not code for amino acids / proteins

Reject references to making amino acids, once

3

(c) 1. Restriction mapping / described;

2. DNA / base sequencing (of fragments) / description / name of method;

2

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