Practice Question Set For A-Level
Subject : Biology
Paper-1 Topic: 4 Genetic Info and Variation and Relationships

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) (The proteome is the full) range of / number of different proteins that a cell is able to produce (at a given time);

OR

(The proteome is the full) range of / number of different proteins the genome / DNA is able to code for;

Do not accept number of proteins unqualified

1

(b) 1. mRNA does not have hydrogen bonds / base pairing, tRNA does;
OR
mRNA is linear / straight chain, tRNA is cloverleaf;

2. mRNA does not have an amino acid binding site, tRNA does;
Accept mRNA cannot carry an amino acid, tRNA can

3. mRNA has more nucleotides;
Accept mRNA is longer or converse

4. (Different) mRNAs have different lengths, all tRNAs are similar / same length;

5. mRNA has codons, tRNA has an anticodon;
Statements must be comparative

2 max

(c) 1. mRNA associates with a ribosome / ribosome attaches to mRNA;
Idea of association is required

2. Ribosome moves to / finds the start codon / AUG;

3. tRNA brings / carries (appropriate / specific) amino acid;
Must be explicitly stated and not inferred.

4. Anticodon (on tRNA complementary) to codon (on mRNA);

5. Ribosome moves along to next codon;
OR
Ribosome 'fits' around two codons / can fit two tRNAs;
Must be explicitly stated and not inferred.

6. (Process repeated and) amino acids join by peptide bonds / condensation reaction (to form polypeptide);

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OR

(Process repeated and) amino acids joined using (energy from) ATP (to form polypeptide);

5

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Q2.

(a) 1. (Presence of) antigen of the (pathogenic) bacteria;

Assume bacteria are pathogenic unless otherwise stated

2. (Causes) more T cells produced / faster T cell production;

3. Against (the pathogen and) normal bacteria;

4. (Long lasting as) cells do not die / live for longer;

5. (More) cytokines / chemicals causing swelling are produced;

3 max

(b) 1. (Some people) have a mutation / allele / gene;

2. (That) increases the chances / risk / makes it more likely for / causes them to have an unusually large T cell response;
OR
(That) lowers / removes tolerance to (normal) intestinal bacteria;

2

(c) 1. (Some people might) produce (very) large amounts of cytokine / have large amounts of swelling;

2. (That) 5-ASA drugs cannot control / reduce;

OR

3. Some people may be allergic to / cannot tolerate 5-ASA;

4. So cannot take it;

Award 1 and 2

OR

Award 3 and 4

2

(d) 1. (Lack of adenine and guanine) will slow / stop DNA synthesis / replication (in T cells);

2. Affects T cells **more** as they cannot recycle nucleotides;

Needs idea of more / greater effect.

Accept converse idea that 'other' cells not as affected as they can recycle nucleotides.

3. (6-MP therefore) suppresses / slows the (unusually large) T cell / immune response
OR
(6-MP causes) fewer / no T cells (to be) produced;

Accept (6-MP) acts as an immunosuppressant drug

4. (So) less cytokine is produced (and therefore less swelling);

3 max

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