Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) Put the (stiffness) scores (for each concentration) in (value/rank) order **and** found middle value;

Accept descriptions of (rank/value) order, eg smallest to largest

Accept find the $\frac{(n+1)^{th}}{2}$ *term/value*

1

(b) **Max 4 for mark points 3 to 9**

For

1. (All concentrations) reduced stiffness (compared with 0 mg kg^{-1});

2. (Reduced stiffness) could mean less damage/pain

OR

(Reduced stiffness) could improve movement/mobility

Against

3. No idea of range/SD

OR

No statistical tests, **so** do not know if differences are due to chance/significant;

Do not accept results unqualified

4. No result for 37.5

OR

No data between 25.0 and 50.0;

5. Not clear if enzyme/damage is the same (as OA);

6. All mice had stiffness, **so** not (completely) effective/cured

OR

Only reduced the amount of stiffness;

7. (Investigation) carried out in mice

OR

(Investigation) not carried out in humans;

8. (Investigation) only six weeks

OR

Do not know long-term effect;

9. Small sample/20 (mice) in each group

OR

20 (mice) is a small sample size;

5 max

[6]

Q2.

(a) 1. Sequence/order of amino acids;

2. (Joined by) peptide bonds;

2

(b) 1. (Universal) The same codon/triplet always codes for the same amino acid;

2. (Non-overlapping) Each base is only part of one triplet/codon

OR

(Adjacent) codons/triplets do not overlap;

Accept '3 bases' for triplet

Accept 'base/triplets/codons only read once'

3. (Degenerate) More than one codon/triplet codes for each amino acid;

3

[5]

Q3.

(a) 1. Everything other than the COOH inside drawn box;

1

(b) (Triglyceride)

1. 3 fatty acids rather than 2;

2. 3 ester bonds rather than 2;
   Accept 'only 2 fatty acids'

3. No phosphate group;
   1, 2 and 3 Accept converse

2 max

(c) 1. Phospholipid both hydrophobic and hydrophilic

OR

Phospholipid polar

OR

Phosphate group is charged;

2. Triglycerides only hydrophobic

OR

Fatty acid/triglyceride is non-polar;
Accept 'Triglycerides not hydrophilic'

3. Hydrophilic/phosphate group attracts water (to either side of bilayer);
   Accept 'faces water' for 'attracts water'
   Ignore 'fatty acids repel water'

3

(c) 1. Fatty acid A is saturated

OR

Fatty acid B is unsaturated;

2. (At 4 months) less fatty acid A **and** more fatty acid B

OR

Fish oil has more fatty acid B than fatty acid A;
1 and 2 Accept identification of A (as saturated) or B (as unsaturated) using numbers from the table

3. Increase in fluidity caused by increased unsaturated fatty acids

OR

Increase in fluidity caused by increased fatty acid B (from the fish oil);

4. Double bonds/unsaturated fatty acids cause bends/kinks in fatty acid tail

OR

(Membrane more fluid because) phospholipids further apart;

3 max

[9]