Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

(a)
1. Chemoreceptors detect rise in CO_2 / H_+ / acidity / carbonic acid / fall in pH
OR
Baro / pressure receptors detect rise in blood pressure;
2. Send impulses to cardiac centre / medulla;
3. More impulses to SAN;
4. By sympathetic (nervous system for chemoreceptors / CO_2)
OR
By parasympathetic (nervous system for baro / pressure receptors / blood pressure);

1. Ignore: location of receptors.

1. Ignore: chemoreceptors detect oxygen.

2 and 3. Accept: action potentials.

2. Reject: 'messages', 'signals', 'an impulse' or an 'action potential'.

3. Ignore: messages', 'signals', 'an impulse' or an 'action potential' as emphasis here is on increase in frequency.

4

(b)
1. Less / no malonyl-CoA;
2. (More) fatty acids transported / moved into mitochondria;
3. Respiration / oxidation of fatty acids provides ATP;

1. 'Inhibition of malonyl-CoA' on its own is not enough but accept production of malonyl-CoA is inhibited.

2. Accept: 'transport of fatty acids into mitochondria is not inhibited'.

2. Ignore: method of entry.

3. Accept: for respiration any stage of aerobic respiration e.g. Krebs (cycle), link (reaction) etc.

*3. Reject: production of energy, **but** accept production of energy in the form of ATP.*

3. Accept: acetyl CoA can enter Krebs cycle / mitochondria to provide ATP.

3

[7]

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Q2.

(a) 1. Osmosis does not occur;
2. Chloroplast / organelle does not burst / lyse / shrivel / shrink;

1. Accept: osmosis would occur if water potentials were not the same.

*1 and 2, Accept: correct reference to osmotic lysis for **2 marks**.*

2. Accept: chloroplast would burst / lyse / shrivel / shrink if water potentials were not the same.

2. Reject: 'cell bursts/shrivels'

2. Ignore: damage to chloroplasts on its own is not enough for a mark.

3. Reject: becomes turgid / flaccid.

2

(b) 1. To show light does not affect DCPIP;
2. To show chloroplasts are required;

Ignore: comparison with other tubes.

2

(c) 1. Reduction of DCPIP by electrons;
2. (From) chlorophyll / light dependent reaction;

1. Accept: hydrogen / H for electrons but not protons / hydrogen ions / H on their own.*

2. Accept: from chloroplasts / photosystems / water.

2

(d) Provides a standard / reference point
OR
Can compare different chemicals/weed-killers
OR
Can compare different concentrations of chemicals / weed-killers;

*Accept: decolourises quicker than 100% **or** saves time waiting for complete decolourisation.*

Note: comparisons must be qualified.

*Accept: find the most effective weed-killer **or** the most effective concentration.*

Accept: answers relating to cost effectiveness.

1

(e) 1. Less / no ATP produced;
2. Less / no reduced NADP produced;
3. Less / no GP reduced / converted to TP;

2, Accept: less / no NADPH / $NADPH_2$ / NADPH + H

2 max

[9]

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Q3.

(a) Used to produce named phosphate compound in cells;
e.g. ATP / ADP / phospholipids / DNA / RNA / RuBP / TP /GP etc.

1

(b) Example of a carbon-containing biological compound e.g. carbohydrate / amino acid / vitamin;

Accept: sugars / organic (compounds).

Ignore: products of photosynthesis.

Ignore: starch.

1

(c) 1. Represents dry mass / mass of carbon;
2. Represents gross production minus respiratory losses;

2. Accept: NPP = GPP −R.

2. Accept: Chemical energy minus respiratory losses.

1 and 2. Chemical energy store minus respiratory losses = 2 marks.

2

(d) 1. For the control an increase in phosphate increases (plant) growth;
2. For *Entrophospora* an increase in phosphate reduces (plant) growth;
3. *Scutellospora* reduces (plant) growth (compared to control);
4. *Entrophospora* and *Glomus* increases (plant) growth (compared to control);
5. No SD / statistical test to determine significance;
6. Only 20 weeks of growth;
7. Underground / root growth not known;

5. Accept: no error bars.

7. Accept: only shows shoot growth.

4 max

(e) 1. Answer in range 0.07 to 0.09 = **2 marks**;
2. Answer in range 9.97 to 12.2
OR
Shows division by 140 or 20 × 7 = 1 mark;

2

[10]

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