Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a) (i) in case normal coffee differs in some other way /
to control concentration of caffeine;
1

(ii) not telling them what the drink contained / purpose of experiment;
1

(b) (i) able to continue for longer; *(not just increases performance)*
(disqualify if also refers to fatty acids and glycerol)
1

(ii) breakdown of fats;
at increased rate / by mobilisation of fat stores;
2

(c) (i) idea that volumes of oxygen and carbon dioxide the same;
reference to equal moles, or quotient as 1 divided by 1 / or 6 by 6;
2

(ii) glycogen is a carbohydrate / broken down to glucose, linked to RQ;
with no caffeine, RQ nearer 1.0 / less carbon dioxide exhaled and
more oxygen inhaled (or vice versa) / with caffeine higher proportion of fats / fatty acids respired;
increased time to exhaustion suggests slower use of glycogen:
3

[10]

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Q2.

With hormone (third column) cadmium produces large / significant / 45% fall in enzyme production;
without hormone (second column) no significant effect on enzyme production with cadmium;.

2 max

[2]

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Q3.

(a) very long / deep roots, to reach water deep in the soil / nitrogen-fixing bacteria, to provide a source of nitrogen for growth in poor soil;

interspecific;

1

(b) (mesquite) proteins / amino acids (ploughed) into soil / nodules ploughed in and (decomposers) bacteria / fungi feed on these;
excrete ammonia;
nitrifying bacteria convert these to nitrites / nitrates;
absorbed by roots of grasses and increase their growth;
accept increases recycling of other ions / phosphate / potassium;

1

(c) control organism a parasite / predator;
specific to pest;
population varies with population of pest;
controls size of pest population but does not kill all;
keeps pest population low enough to prevent significant (economic) damage;

3 max

[5]

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