

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 series

5014 ENVIRONMENTAL MANGEMENT

5014/22

Paper 2, maximum raw mark 60

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- 1 (a) (i) peak harvest and demand coincide; so no drop in price/price may increase/more (money/profit); all crop sold/no crop wasted; have money for any household expense/food/hospital/school fees; have money for farm costs; standard of living; [2]
- (ii) 58, 62, 80%;
All three for two marks. Two for one mark. [2]
- (iii) as a control/idea explained/idea of comparison; [1]
- (iv) cost (of acids); do not know how to use them/suspicious of using them; extra time/work and not worth extra seedlings; ref. to acid contamination of soil; ref. to contamination of water; ref. harm to humans; low/unavailability of acids; [2]
- (b) (heavy) metal poisonous/toxic; ref. contamination of (soil) water; absorbed by plants; not broken down/excreted (by animals); so accumulates in (animal/plant/organism) body; builds up/passess) along food chain; kills top predators; bioaccumulation; biomagnification; [3]
- (c) (this/resting) restores nutrients/minerals/named mineral/ref. clover etc.; crops grow better/less fertiliser needed; allows pests/diseases to die out/fewer pests; crops grow better/yield not decreased; [2]
- (d) (i) to check for (error/reliability)/can find a mean/backup if one tray fails; [1]
- (ii) comparing 3 to 1: (more/2) trays so reliability (can be checked); can find a mean/back up if one tray fails; [3]
- comparing 3 to 2: because result measured twice/at 20 and 25 days;
- allows (greater chance) of full germination/more accurate estimation of germination rate;
- (iii) size of tray; volume (amount) of soil; depth of soil; type soil; pH of soil; temperature; (volume/amount) of water; (amount) of light; type/variety of seed; seed age; [3]
- (e) (i) orientation of line graph only (not if bar chart);
- axes labelled;
- plots; [4]
- (ii) increase then plateaus/levels off/cuts off/evens out/eq.; [1]
- (iii) do not plant more than 200 per tray/do plant (between 150 and 200); above this seeds wasted/no further yield of seedlings/no money wasted/eq.; [2]

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- (f) (i) ($25^{\circ}\text{C} - 22^{\circ}\text{C} = 3^{\circ}\text{C}$); [1]
- (ii) (weather / rain / temperature) conditions remain constant / eq.; temperature always warm enough / $15^{\circ}\text{C} - 20^{\circ}\text{C}$; sufficient water; [2]
- (iii) spread of plant disease / fungal infection; surface run-off; soil erosion; loss of topsoil; nutrient leaching; spread of (water-related / eq.) disease; crop damage / loss; [3]
- (g) (i) selective breeding; best plants have good alleles (accept genes) / eq.; best plants pass on good alleles (accept genes) to next generation / eq.; further detail; [2]
- (ii) genetic engineering; transfer of genes (for high yield); further detail; cloning / tissue culture / micropropagation; [2]
- 2 (a) still rely on imports / depend on Mexico / money going to Mexico; greenhouse gases / named greenhouse gas; leading to global warming / greenhouse effect / eq.; (finite / unsustainable) supply; costs of supplying more electricity increase; acid rain; H.E.P. more land flooded / relocation; AVP; [4]
- (b) very remote / far away; difficult terrain; too far for effective powerlines; few power plants / power stations far away; ref. to cost of powerlines; not many people live there / (so) low demand; [2]
- (c) (i) systematic sampling;
- at noted location, use of compass; layout transect line (with tape); from powerlines into forest; secure with pegs / eq.; placing quadrat at intervals; identify species with book; record number of different species (in quadrat); in notebook; repeat;
- OR
- random sampling;
- detail of quadrat placing (throw quadrat / layout grid); under powerlines and in forest; identify species with book; record different species in quadrat; in table in notebook; repeat; AVP; [5]
- (ii) repeat on other sites (when repeating keep variables constant) / compare with similar studies; [1]

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- (d) (i) 0100–0400 (or within this range); [1]
- (ii) getting dark; more home; cooking; AVP; [2]
- (iii) cheaper to invest in reducing demand; sustainable reductions/better use of resources; new power plants not sustainable; less reliant on imports; cheaper electricity/spending less on electricity helps GDP/eq.; environmental reasons; human health reasons; AVP; [4]
- (e) (i) by using diesel generators/solar panels/water wheel/wind turbine; [1]
- (ii) each of three questions about small-scale generation; layout;
such as:
Do you know how to run a generator/do you have the money to buy a generator?
Do you know anything about small wind turbines/could you pay for one?
Have you seen small solar panels working? [4]

AVP = Alternative Valid Point.

[Total: 60]