UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

5014 ENVIRONMENTAL MANAGEMENT

5014/02 Paper 2, maximum raw mark 60

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International Examinations

1 **(a)** protein/oils/energy/calcium/vitamin D/prevents kwashiorkor/rickets; [1]
[A vitamins and minerals R nutrition]

(b) *to villagers:* more income; employment; more food; raise standard of living; can afford schools/medical treatment;
to government: more foreign exchange; economic advantage e.g. exports/BOP;more taxes; more money for infrastructure e.g. hospitals; villagers need less/no aid; [max 2]

(c) **(i)** drawing sealed ponds inside lagoon; six ponds; one labelled nursery pond; [3]

(ii) 200 000 ÷ 80; = 2500 (Kg); ignore other units [2]

(iii) 1 coconuts located at C/nearest the land;
2 dig up coconuts – why to get pH between 7–8/see if pH changes;
3 take more samples – why to check the results/see if pH changes over time;
4 not building ponds – why not in acid parts/below pH 7/C/build in other areas/ABDE; [3]

(d) **(i)** lose coastal protection against storms/flooding so damage the village/their boats/the fishponds; spawning grounds are lost so no more breeding stock; reduced fishing catches so less food/health/income/jobs; too many ponds means too much labour directed at ponds/cost of labour/not enough labour for other tasks/e.g. of tasks; leads to poverty;
AVP; further details of the above [max 5]

(ii) find out how to breed to produce eggs in ponds/eq; set up special breeding ponds; how to keep fry alive/encourage growth; better method of catching fry/how often can they be caught/discover their breeding pattern/location of breeding; [2]

2 **(a)** **(i)** to prevent impurities/dirt/solid debris; first flush is acidic/prevent chemical pollution e.g. pesticides;
[R fertilisers] [2]

(ii) mosquitoes would lay their eggs; larvae hatch and increase mosquito population; so more diseases spread; [1]

(iii) stop more solids/debris/dirt entering; stop other animals entering; maintain water quality; [2]

(iv) lots of work/cost of digging the hole; increased risk of contamination/flooding; or leakage/breakage; more maintenance if underground; need to pump water out/eq; [2]

(b) **(i)** to find the average/make data more reliable/accurate/precise/valid; [1]

(ii) appropriate scaling; axes labelled with key as needed;; plots correct (allow 25% error); [4]

(iii) C – collector damaged/leakage; in a sheltered or windy spot;
[A ref to interception R evaporation unqualified] [2]

(iv) 19 + 17 + 14 + 18 = 68 ÷ 4 = 17; x 40 = 680 litres/eq; [2]
[correct answer only ;;]

(v) to find out the rainfall in mm; improved accuracy (A ref to control); compare to other data/eq; so they could work out how much water the house could collect; [1]

(vi) Either June and July; as little rainfall/lowest no of rainfall days;
need to maintain supply/less/no water available from other sources;

Or Feb–September; as low no of rainfall days; need to maintain supply/less/no water available from other sources;
[A Feb–July R other months ignore one month added to June–July] [3]

(c) (i) steep gradient/big drop in ht/speed/eq;
[R volume and ignore waterfalls] [1]

(ii) they do not release any carbon dioxide/greenhouse gases/less fossil fuels used/renewable; [1]

(d) (i) soil erosion upstream; dam reduces flow rate/water velocity; suspended particles settle out/silt collects; [max 2]

(ii) 6–7 years; [1]

(iii) no more income from electricity; Government/taxpayers still paying for the project after its useful life; so cannot invest in new developments/would have to borrow again to fund next development; [max 2]

(e) (i) *Advantages:* raise standard of living; if near town easier to get jobs; services; less disease from new house; especially in rainy seasons;

(ii) *Disadvantages:* not able to farm; no fodder for cows; expense/time to travel into town; not easy to find a job/ low paid job/need training; less healthy vegetables to eat; loss of contact with family/way of life;

[A towns once any 4 four points] [4]

3 (a) (i) 31 500 ÷ 45 000 x 100 = 70.0%;; [2]

(ii) (root nodules) fix nitrogen/eq; so trees and other crops grow with less/no fertiliser; less money on fertiliser; fodder for animals; reduces soil exhaustion/maintains fertility/adds nutrients to soil;
[R food for humans] [2]

(iii) shelter for other crops/animals; coconuts only a small part of farm income/eq; needed to tie up their cattle; coconut residues feed cattle which earn most money; the treatment can be done/afforded; long time to grow new trees; [max 2]

(b) award one mark for each of the ideas

1. rotation idea;
2. fallow plot;
3. intercropping/described;
4. tea as a cash crop;
5. ref to animal manure;
6. no/less need for fertilisers;
7. maintains soil fertility;
8. balanced farming of plants and at least one animal;
9. income from another sold product (other than tea); [max 5]