MARK SCHEME for the October/November 2012 series

0680 ENVIRONMENTAL MANAGEMENT

0680/41   Paper 4 (Alternative to Coursework), maximum raw mark 60

Mark schemes will use these abbreviations:

- ;   separates marking points

- /   alternatives

- ®   reject

- A   accept (for answers correctly cued by the question)

- [I]   ignore

- AW   alternative wording (where responses vary more than usual)

- AVP   additional valid point (where there are a variety of possible additional valid answers)

- <u>underline</u>   actual word given must be used by candidate (grammatical variants excepted)

- D, L, T, Q   quality of drawing / labelling / table / writing as indicated by mark scheme

- max   indicates the maximum number of marks that can be given

- eq   equivalent

- ORA   or reverse argument

- IDEA OF   where candidates are expected to make an argument which expresses a particular idea, but the ways in which they will do this will be many and varied

1 **(a)** **(i)** to help people get jobs / more skilled jobs / eq / reduce unemployment / improve standard of living / example of raised standard of living such as family planning;

(ii) to stop loss of revenue / improve international standing / rule of law / reduce corruption / eq / AVP (e.g. to maintain biodiversity); [2]

(b) **(i)** **B**;
replicates present / an average can be taken / not relying on one result;
same number of seeds;
more seeds;
same quantity of water;
(**A** = no marks, **C** = max 2 for replicates and same quantity of water) [max 4]

(ii) soil pH;
soil type;
soil texture;
particle size(s);
drainage;
mineral / nutrient / organic content; [max 2]

(iii) not stimulated by light (due to shading) / soil too dry /release chemical to stop germination / chemical from roots / chemical from leaves; [1]

(c) **(i)** to gain maximum yield;
more profit / eq;
to reduce competition with other plants;
reduce growth of alang alang / weeding;
reduce soil erosion;
easy to harvest; [max 2]

(ii) *sustainable:*
carbon neutral;
this idea described;
renewable / can regrow the oil palm.
not sustainable:
fuels burnt in transport / describe example;
soil fertility lost over time;
encourages deforestation / reduces biodiversity;
AVP (e.g. other land must be used to grow food crops); [max 3]

(iii) the number / amount of (different) species (in an area / habitat) or ref. to different biological groups; A other valid definition A types [1]

(iv) medicinal plants still available / genetic resource / genes kept for the future /rare / eq species help to promote ecotourism / maintain food webs / chains / balance of nature; [1]

(d) (i) orientation;
both axes labelled (yield in tonnes per hectare and years);
plots;; (allow one error on each plot) [4]

(ii) 16 and 21; (A 15–17 and 21–22) (A other correct reading from graph as an error carried forward) [1]

(iii) IDEA OF the extra cost of the fertiliser must be less than the extra value of the crop; [1]

(iv) 0.5, 2.5, 3.0, 3.0, 6.0, 4.0;;
(6 correct = 2 marks, 4–5 correct = 1 mark, 0-3 correct = 0 mark) [2]

(v) 6 / 13 × 100 = 46.1 (allow 46, 46.15, 46.2) [1]

(vi) earn more money / easier / cheaper to harvest / process / eq; [1]

(e) *farmer:*
less work / labour / maintenance / weeding;
regular income;
clones give more product / income / eq;
rice / other crops grown;
ref. to medicinal plants used;
ref. to shorter time to first harvest;
environment:
some forest grow back / eq;
helps to maintain biodiversity / prevent further loss;
soils not likely to be eroded / lose fertility;
soils not damaged further;
good interception;
so less flooding risk;
AVP (for either part, e.g. ref. ecotourism);
(max 4 for either part) [max 6]

[Total: 32]

2 (a) (i) less interception;
less root absorption;
less infiltration / more surface run off;
soil not held by roots;
soil changes properties / e.g. becomes impermeable / eq;
ref. to transpiration;
rivers now silted up so flood more easily; [max 3]

(ii) soil erosion / loss of fertility / damage to infra-structure / described example; [1]

(iii) dust; (leads to weaker lungs / more infections) (A dirt) [1]

(iv) rate doubled for children / eq;
(if answer given is 'change is greater in children' (no mark), then max 1 total if further qualification is given as below)
adults show smaller increase (however expressed);
quote the increase figures 3 or 5%; [max 2]

(b) (i) same people;
same numbers;
same season;
same area;
same questions;
same results table;
all ages;
both sexes;
selected at random; [max 2]

(ii) *yes:*
more (stagnant / standing) water;
so more breeding mosquitoes / described; [2]
no: no valid answers possible so 0 marks

[Total: 11]

3 (a) (i) 19.7; ([I] $ sign) [1]

(ii) *yes*: justified by working to support answer (e.g. 41 – 19.7 = 21.3);
A 40 –19.7 =20.3 [1]

(iii) June 2008; [1]

(b) (i) fewer leaves on plants near road;
plants shorter;
less (dense) vegetation;
fewer species / types of plant / less biodiversity;
no plants next to the road;
no palm trees; [max 2]

(ii) *no*:
after three years any of the points in **(b) (i)** have improved;;
marks are for two reasons, only one reason = only 1 mark [2]

(iii) sample at stated distance from road;
transect line;
each side of the road sampled;
use of quadrat / defined area;
record species inside quadrat / eq;
record results in a notebook;
ref. to other sensible method; [max 2]

(c) (i) *marks or for reasons in support of either mine – table shows reasons in support of either Mine one or Mine two – maximum marks can be obtained by a coherent argument for either of the two mines as below*

Either	*Or*
Mine one:	*Mine two:*
larger reserves so worth mining; (78 million tonnes)	smaller reserves so mining over more quickly; (35 million tonnes)
longer life (15 yrs) of mine so jobs for longer;	worth mining even if it only lasts 10 years;
investment worthwhile;	enough coal to make investment worthwhile;
more profit to government;	profit possible for government;
more profit to mining company;	profit possible for mining company;
smaller area (5000 hectares) so less environmental damage;	only a slightly larger area (6000 hectares) so not much more environmental damage;
long way (40 km) from the river so pollution very unlikely;	close to river (5 km) for easy / cheap transport;

A any sensible comment about the nature reserve for either answer;   [max 6]

(ii) save rare / endangered species;
stop or reduce poaching;
protect biodiversity;
saved for breeding / genetic resource;
genes can be use to make GMO's;
value to encourage tourism;
moral argument;
AVP (e.g. genes available for selective breeding);   [max 2]

[Total: 17]