GradeMax

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

ENVIRONMENTAL MANAGEMENT **0680/43**

Paper 4 **May/June 2016**

MARK SCHEME

Maximum Mark: 60

Published

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Question	Answer	Marks
1(a)	10.2; 34.0 / 3.9 / 3.99;	**2**
1(b)(i)	three correct squares shaded;;;	**3**
1(b)(ii)	1115 – 675 / 440;	**1**
1(b)(iii)	correct use of scale to give answer in the range 330–390 m^2;	**1**
1(b)(iv)	922 × answer from **(ii)** so answers in the range 304 260 to 359 580 (g);	**1**
1(b)(v)	the root system of plants; is also biomass;	**2**
1(b)(vi)	repeat (with more squares) / to control variables / to use a standardised procedure;	**1**
1(c)(i)	*any 2 of:* the biomass is increasing; increased by 430 g between year 1 and 3; greater increase between year 1 and 2 that 2 and 3; further comment using figures e.g. grows about 200 g per year; biomass nearly doubles between year one and two / eq; less recovery between year 2 and 3; AVP;	**2**
1(c)(ii)	(plan to) protect damaged / unprotected saltmarsh / eq for more than three years / up to five years for complete recovery / know how long for the saltmarsh to recover / needs to be protected;	**1**
1(d)(i)	*any 3 of:* identify species (with a key/eq); count the number of different species; use of suitable scale e.g. ACFOR; found in each quadrat; process data e.g. find average; find diversity index;	**3**
1(d)(ii)	table drawn; headings; 10 spaces for recording;	**3**

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Question	Answer	Marks
1(e)(i)	adds mineral nutrients; named nutrients such as N ,P ,K ; speeds up growth;	**2**
1(e)(ii)	*any 2 of:* eutrophication / described / eq; some species die out/numbers reduced; may cause disease; disrupts food chains; adds toxic substances;	**2**
1(f)(i)	*any 2 of:* produce energy / electricity; for air conditioners; and refrigerators; to make water from desalination plants; AVP e.g. long hours of darkness;	**2**
1(f)(ii)	photosynthesis; (do not accept if respiration also stated)	**1**
1(f)(iii)	prevent damage(in future from) rising sea levels; reduce possible climate change / global warming; conserves fossil fuels for longer; preserves habitats; maintains biodiversity;	**3**

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Question	Answer	Marks
2(a)	*any 4 of:* it reproduces quickly / many / 220–300 eggs; quick hatching; larvae damage trees feeding for 90 days; larvae quickly change to adults; flying adults move to new trees; 3 life cycles a year possible / one female can lay 600–900 eggs a year / eq; AVP;	**4**
2(b)(i)	*any 2 of:* concentration of chemical; temperature; food; water; same source of larvae; dosage; same species of weevil;	**2**
2(b)(ii)	*any 2 of:* as a control; to compare / eq; to find out how many would die anyway;	**2**
2(b)(iii)	5, 70, 40;; 2 correct = [1]	**2**
2(b)(iv)	*any 3 of:* all survive in water after 5 days; none survive chemicals after 5 days / eq; more males paralysed by both chemicals; water does not paralyse; females all dead after 5 days but some males alive for both chemicals; more are killed at 5 days than 2 days; use of comparative figures;;	**3**

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Question	Answer	Marks
2(b)(v)	*carbosulfan or dimethoate* *any 3 of:* kills both males and females; kills all the females; kills males quickly; kills more females after 2 days; stops reproduction / laying eggs;	**3**
2(c)	both axes labelled;; sensible scale; plots; allow ± ½ square for plots	**4**
2(d)(i)	spray in Jan / Feb before the population increase / to kill larvae / eq;	**1**
2(d)(ii)	masks / gloves / other protective clothing;	**1**
2(d)(iii)	biological control method / described in outline;	**1**
2(e)(i)	*any 4 of:* to maintain traditional food / culture; keep people employed; improve food security; maintain / develop export market; to develop scientific knowledge in UAE; become world leader in producing weevil resistant palms; AVP e.g. government revenue/improve standard of living	**4**

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Question	Answer	Marks
2(e)(ii)	*any 3 of:* find DNA / genes / alleles; resistant to weevil attack; reference to cloning / tissue culture produces uniform trees; genetic engineering / GM trees; drought resistant; salt tolerant; produce higher yields; top quality/highest value fruit; reference to healthy food; extra income for the country;	**3**

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