

Country: _____

Student Code: _____

23rd INTERNATIONAL BIOLOGY OLYMPIAD

8th – 15th July, 2012

SINGAPORE



PRACTICAL TEST 4

ANIMAL ANATOMY & ECOLOGY

ANSWER KEY

Total points: **100**

Duration: **90 minutes**

Task I (20 points)

Anatomy of molluscs

Answer the following questions:

Q1.1 (3 points × 2 = 6 points)

1	2
a	c

Q1.2 (2 points × 2 = 4 points)

1	2
1	1

Q1.3 (2 points × 2 = 4 points)

1	2
2	2

Q1.4 (2 points × 2 = 4 points)

1	2
c	c

Q1.5 (0.4 points × 5 = 2 points)

a	b	c	d	e
✓	✓	✓	x	x

Task II (80 points)

Rank-abundance plots, ABC curves and community structure

Q2.1 (8 points × 4 = 32 points) See Tables 1 – 2.

Q2.2 (3 points × 4 = 12 points) See Graphs 1 – 4.

Q2.2.1 (1 point × 5 = 5 points)

a	b	c	d	e
✓	x	✓	x	✓

Q2.2.2 (2.5 points × 4 = 10 points)

1	2	3	4
F	C	E	B

Q2.2.3 (1.5 points × 4 = 6 points)

Highly disturbed → undisturbed			
2	4	1	3

Q2.2.4 (1 point × 10 = 10 points)

1	2	3	4
B1, B6	A1, A2, B3, B4	A3, B7	B2, B5
or			
A3, B1, B6	A1, A2, B3, B4	B7	B2, B5

Q2.25 and Q2.26 (2.5 points × 2 = 5 points)

Q2.2.5	Q2.2.6
K	J

Task II (80 points)

Rank-abundance plots, ABC curves and community structure

Q2.1 (8 points × 4 = 32 points) See Tables 1 – 2.

Q2.2 (3 points × 4 = 12 points) See Graphs 1 – 4.

Q2.2.1 (1 point × 5 = 5 points)

a	b	c	d	e
✓	×	×	✓	×

Q2.2.2 (2.5 points × 4 = 10 points)

1	2	3	4
F	C	E	B

Q2.2.3 (1.5 points × 4 = 6 points)

Highly disturbed → undisturbed			
2	4	1	3

Q2.2.4 (1 point × 10 = 10 points)

1	2	3	4
B1, B6	A1, A2, B3, B4	A3, B7	B2, B5
or			
A3, B1, B6	A1, A2, B3, B4	B7	B2, B5

Q2.25 and Q2.26 (2.5 points × 2 = 5 points)

Q2.2.5	Q2.2.6
K	J

Table 1. Community 1

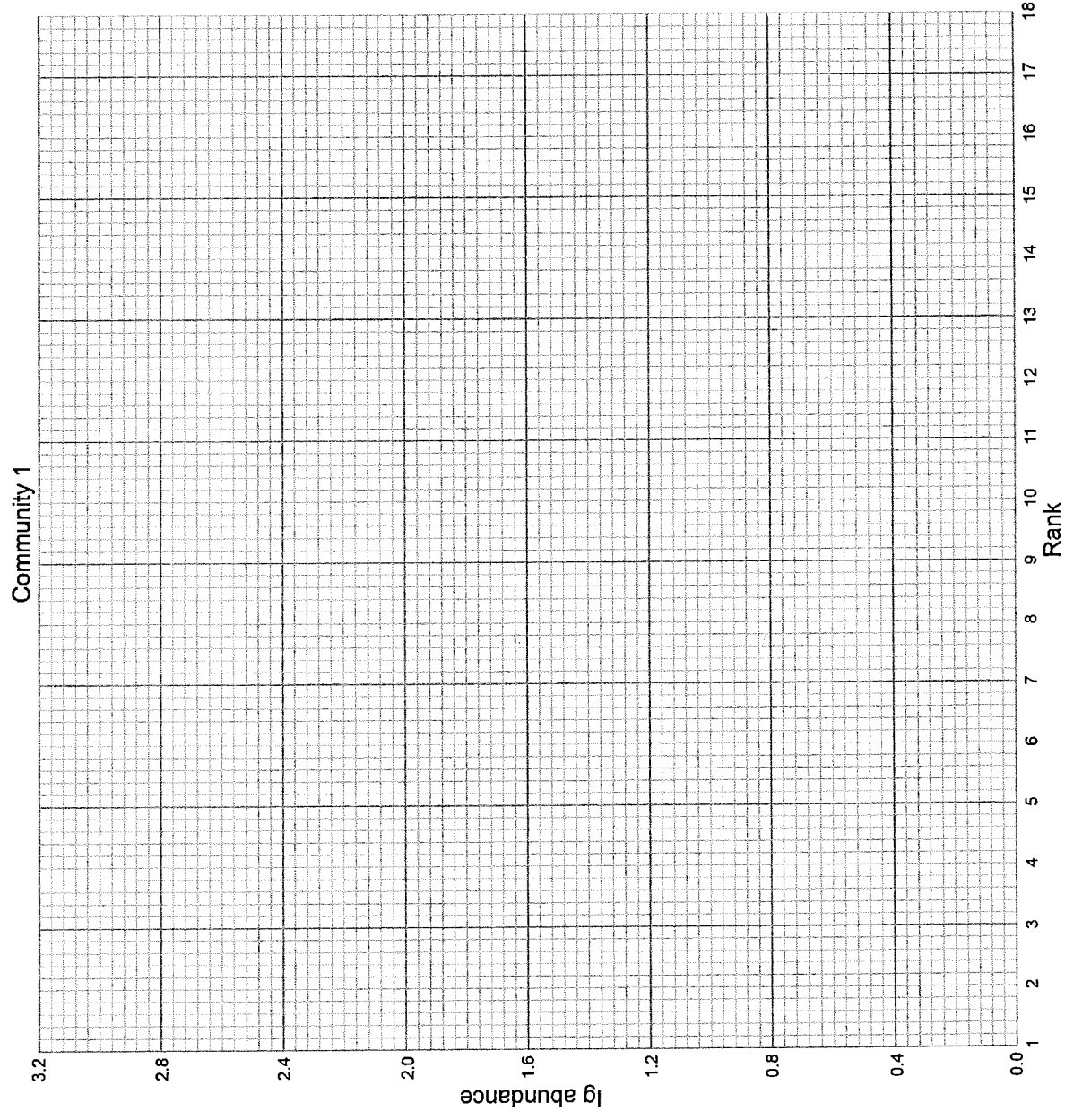
Species	Abundance	Rank	Log ₁₀ (lg) Abundance	% Abundance	Cumulative % Abundance (+/- 0.10)	Biomass of individual	Total biomass of species	% Biomass	Cumulative % Biomass (+/-0.10)
N	120	1	2.08	17.39	17.39	1.00	120.00	10.05	10.05
D	115	2	2.06	16.67	34.06	2.80	322.00	26.98	37.03
I	100	3	2.00	14.49	48.55	1.25	125.00	10.47	47.50
P	85	4	1.93	12.32	60.87	1.70	144.50	12.11	59.61
F	78	5	1.89	11.30	72.17	1.15	89.70	7.51	67.12
K	62	6	1.79	8.99	81.16	4.00	248.00	20.78	87.90
E	50	7	1.70	7.25	88.41	1.30	65.00	5.45	93.34
B	25	8	1.40	3.62	92.03	0.90	22.50	1.88	95.23
M	20	9	1.30	2.90	94.93	1.50	30.00	2.51	97.74
H	15	10	1.18	2.17	97.10	1.35	20.25	1.70	99.44
J	12	11	1.08	1.74	98.84	0.05	0.60	0.05	99.49
G	5	12	0.70	0.72	99.57	0.80	4.00	0.34	99.82
A	3	13	0.48	0.43	100.00	0.70	2.10	0.18	100.00
Total	690						1193.65		

Table 2. Community 2

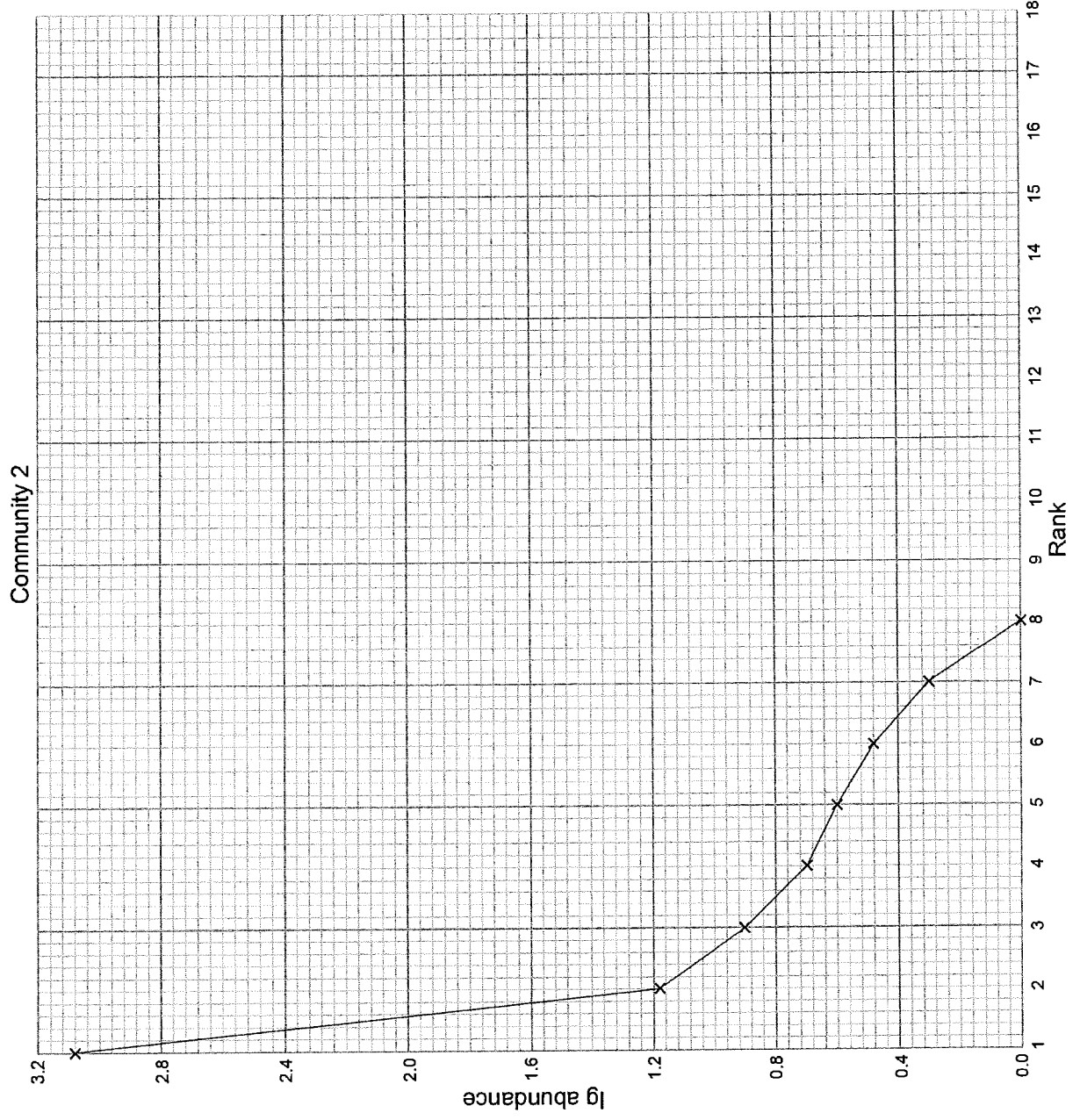
Species	Abundance	Rank	Log ₁₀ (lg) Abundance	% Abundance	Cumulative % Abundance (+/- 0.10)	Biomass of individual	Total biomass of species	% Biomass	Cumulative % Biomass (+/- 0.10)
J	1200	1	3.08	96.93	96.93	0.05	60.00	64.38	64.38
A	15	2	1.18	1.21	98.14	0.70	10.50	11.27	75.65
B	8	3	0.90	0.65	98.79	0.90	7.20	7.73	83.38
G	5	4	0.70	0.40	99.19	0.80	4.00	4.29	87.67
N	4	5	0.60	0.32	99.52	1.00	4.00	4.29	91.96
I	3	6	0.48	0.24	99.76	1.25	3.75	4.02	95.98
E	2	7	0.30	0.16	99.92	1.30	2.60	2.79	98.77
F	1	8	0.00	0.08	100.00	1.15	1.15	1.23	100.00
Total	1238						93.20		

Student code: _____

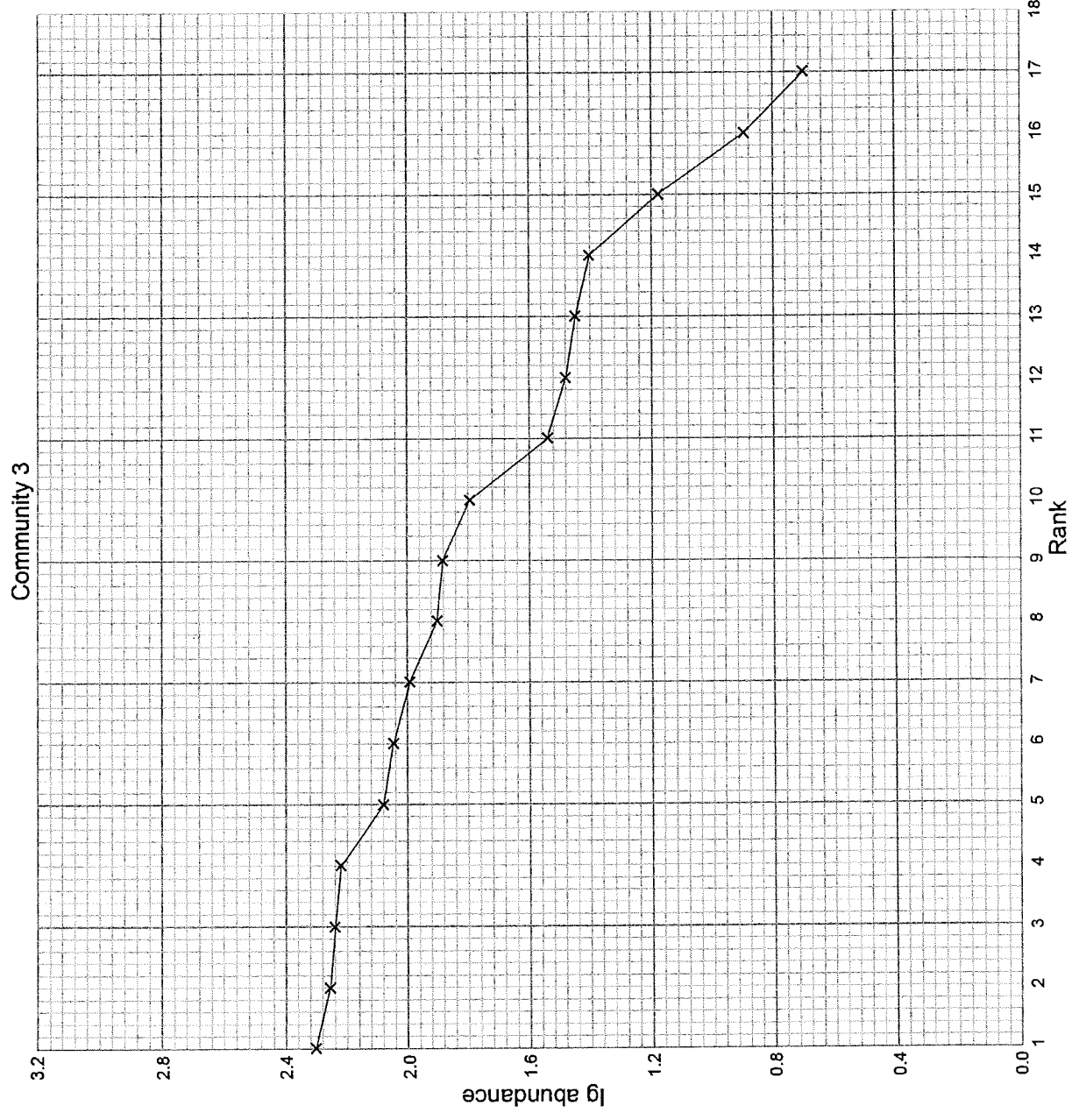
Graph 1 (3 points)



Graph 2



Graph 3



Graph 4

