

25th INTERNATIONAL BIOLOGY OLYMPIAD

5 – 13 July 2014

INDONESIA



PRACTICAL TEST 4 ECOLOGY AND ETHOLOGY ANSWER KEY (Rev. 07-07-14)

Total points: **100**

Duration: 90 minutes

COUNTRY:
STUDENT:

The answers have to be given either with a tick (✓) or with Arabic numbers. The numbers "1" and "7" can look very similar in handwriting. To make sure that those two numbers can be well distinguished by the IBO staff, please write them as you normally would into the following box.

1 =	<input type="text"/>	7 =	<input type="text"/>
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Biogeography and Biodiversity

TASK 1. ISLAND BIOGEOGRAPHY

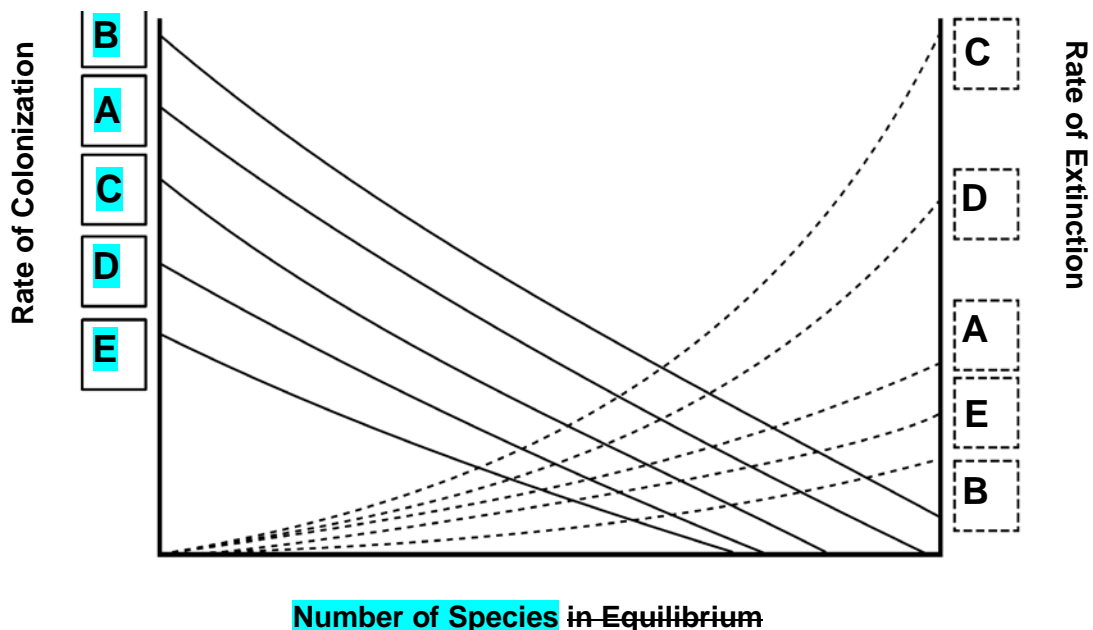
Question 1.1 (5 points: 5 x 1) (straightforward – no partial points)

No.	Island	Distance from mainland (km) (accepted range in parentheses)
1.	Ternate	12.8 (12.4 – 13.2)
2.	Tidore	9.7 (9.3 – 10.1)
3.	Mare	13.0 (12.6 – 13.4)
4.	Moti	14.1 (13.7 – 14.5)
5.	Makian	17.8 (17.4 – 18.2)

Grading Rule:

- Measurements within range are accepted for 1 point each, no partial points.
- *Range determined as mean of 20 measurements that have been made during our simulation, +/- standard deviation which reached 0.35. Therefore, the accepted range was determined as mean +/- 0.40.

Question 1.2 (10 points: 10 x 1) (straightforward)



Question 1.3 (2 points: 2 x 1) (straightforward)

Place a tick (√) mark in the box of your selected correct answer.

A	B	C	D	E
√	√			

TASK 2. PRIMARY SUCCESSION AFTER VOLCANIC ERUPTION

Part A : Succession and Plant Community Structure

Question 2.1 (3 points) (straightforward–no partial points)

Place a tick (√) mark in the box of your selected correct answer

A	B	C	D	E
			√	

Question 2.2 (5 points; 10 x 0.5) (straightforward–no partial points)

Fill in your calculated similarity indices in the boxes provided.

Year	1934	1949	1963	1979	1991
1949	0.60				
1963	0.52	0.32			
1979	0.48	0.29	0.94		
1991	0.52	0.26	0.89	0.95	

Question 2.3 (2 points) (straightforward–no partial points)

Place a tick (√) mark in the box of your selected correct answer.

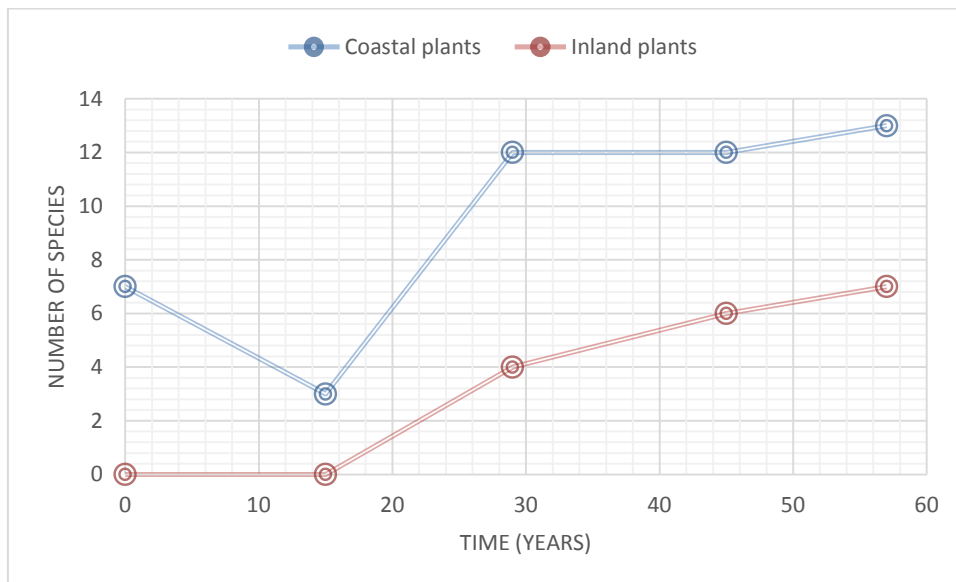
A	B	C	D	E
				√

Question 2.4 (4 points: 4 x 1)

Place a tick (✓) mark in the box of your selected correct answer. (straightforward–no partial points)

Statement	True	False
A		✓
B		✓
C	✓	
D		✓

Question 2.5 (6 points)



Grading Rule

- Correct format of graph using correct data from table (two separate graphs for coastal and inland plants will also be accepted) (5 points)
- correct axes and labels (1 point)

Question 2.6 (2 points: 2 x 1) (straightforward–no partial points)

Place a tick (✓) mark in the box of your selected correct answer.

Statement	True	False
A		✓
B	✓	

Part B : Dispersal Biology of *Ficus*

Question 2.7. (15 points) Answer data may vary slightly among participants

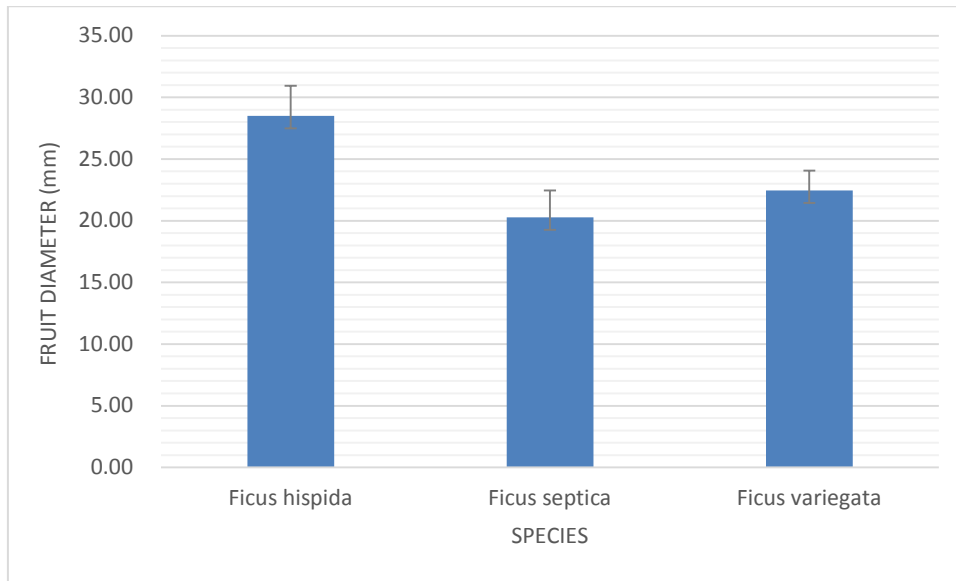
Fruit Serial Number	Fruit Diameter (mm)		
	<i>Ficus hispida</i>	<i>Ficus septica</i>	<i>Ficus variegata</i>
1	32		
2			22.5
3		21	
4			20
5		20	
6		18	
7			21
8		19	
9	28		
10			24
11		23	
12	30		
13		21	
14			21.5
15	29		
16		24	
17	27		
18		20	
19			24
20			22
21		18	
22			
23	25		
24			23.5
25	26		
26			20.5
27		22	
28	31		
29			23
30		17	
Mean	28.50	20.27	22.45
Std. Dev.	2.45	2.20	1.60

*Measurements should be with two decimal places.

Grading Rule

- Each measurement = 0.25 point (total 7.5 points).
- Mean and standard deviation = 2.5 points for each species.
- Measurements will be compared to our own record of measurements.

Question 2.8. (8 points)



Grading Rule:

- Correct format of bar graph (4 points)
- Graph based on correct values from Question 2.7 (2 points)
- Standard deviation given correctly (1 point)
- Vertical axis given correct label and units (1 point)

Question 2.9 (4 points: 4 x 1)

Place a tick (✓) mark in the box of your selected correct answer: (straightforward – no partial points)

Statement	True	False
A	✓	
B	✓	
C	✓	
D		✓

Question 2.10 (3 points: 3 x 1) (straightforward – no partial points)

Place a tick (✓) mark in the box of your selected correct answer:

Statement	True	False
A	✓	
B		✓
C	✓	

TASK 3. SPECIATION IN SONGBIRDS

Question 3.1 (1 point: 2 x 0.5) (straightforward – no partial points)

Place a tick (√) mark in the box of your selected correct answer.

A	B	C	D	E
		√		√

Question 3.2 (18 points: 9 x 2) (straightforward–no partial points)

Songbird Number	Syllable Repertoire	Acceptable Range for Answers
1	11	9 – 13
2	19	17 – 21
3	30	28 – 32
4	20	18 – 22
5	29	27 – 31
6	11	9 – 13
7	32	30 – 34
8	12	10 – 14
9	24	22 – 26

Question 3.3 (3 points: 3 x 1)

Group	Songbird Number
...	1, 6, 8
...	2, 4, 9
...	3, 5, 7

Grading Rule:

- Grading within a group will only be based on the first three numbers (in the case where students enter more than three songbird numbers in a group).
- Full point (1) given if all three numbers are correct.
- Partial point (0.5) given if two numbers are correct.
- No points (0) given if only one number or none is correct.

Question 3.4 (8 points: 2 x 4)

	Group	Group
	11	30
	11	29
	12	32
Mean within group	11.33	30.33
Variance within group	0.11	0.78

Calculated t-value	20.152
Table t-value	2.132

Grading Rule:

- 1 point each for mean and variance for two groups.
- 2 points each for calculated t-value and table t-value.

Question 3.5 (1 point) (straightforward – no partial points)

Place a tick (√) mark in the box of your selected correct answer.

A	B
	√

_____ END OF PAPER _____