

# PRACTICAL TEST 1

## Answer Key

PLANT AND ANIMAL SYSTEMATICS

Total Points: 50

Duration: 90 minutes

**TASK I. (25 points)**

**Part I-1. (9 points)**

**Q1. (9 points)**

Data Matrix 1. (1 point per character) / (0.2 point/box)

Character Taxa	1	2	3	4	5	6	7	8	9	10
A	1	2	1	1	1	1	2	1	1	1
B	1	2	1	1	1	1	2	1	1	1
C	1	0	0	1	0	0	1	1	1	1
D	1	1	0	1	0	0	1	1	1	1
E	1	0	0	2	1	0	0	0	1	0
F	0	0	0	0	0	0	0	0	0	0

**Part I-2. (4 points) Place "√" symbol on the right characters.**

**Q2.1. (1 point) (No partial score per character)**

Character Number	1	2	3	4	5	6	7	8	9	10
Phylogenetically informative		√	√	√	√	√	√	√		√

Q2.2. (1 point) (No partial score)

Character Number	1	2	3	4	5	6	7	8	9	10
Polymorphic		√		√			√			

Q2.3. (2 points = 1 x 2) (1 point per box)

The number of possible unrooted trees: <u>105</u>
The number of possible rooted trees: <u>945</u>

**Part I-3. (8 points) Character state should be given in the parenthesis if the character is polymorphic one.**

Q3.1. (1 point) (0.5 point per character number)

	Character numbers
Character <i>a</i> and <i>b</i>	1, 9

Q3.2. (2 points)

	Character numbers		Taxon name(s)
Character <i>c</i> , <i>d</i> and <i>e</i>	4(1), 8, 10	GI	E
		GII	A, B, C, D

- 1 point for Character numbers. (Deduct 0.3 point per wrong answer. Both character number and state should be correct for characters *c*, *d*, and *e*.)
- 1 point for Taxon name(s) (0.5 point for GI, 0.5 point for GII)

**Q3.3. (3 points)**

	Character number(s)		Taxon name(s)
Character <i>f</i>	7(1)	GII1	A, B
Character <i>g, h, i</i> and <i>j</i>	2(2), 3, 6, 7(2)	GII2	C, D

- 1 point for Character number(s) of character *f*. (no partial score.)
- 1 point for Character number(s) of character *g-j*. (0.25 point per answer. Both character number and state should be correct.)
- 1 point for Taxon name(s). (0.5 point for GII1, 0.5 point for GII2)

**Q3.4. (2 points)**

	Character number		Taxon name
Character <i>k</i>	5	GI	E
Character <i>l</i>	4(2)	GII1a	A
Character <i>m</i>	2(1)	GII1b	B
		GII2a	C
		GII2b	D

- 1 point for Character number(s) of characters *k-m*. (Deduct 0.3 point per wrong answer. Both character number and state should be correct.)
- 1 point for Taxon name. (0.2 point per box.)

**Part I-4. (4 points)**

**Q4.1. (1 point)**

14 steps

**Q4.2. (1 point)**

CI = 13/14

- Any decimals possible. (0.92857.....)

**Q4.3. (1 point)**

4

**Q4.4. (1 point)**

5
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**Task II. (18 points)**

**Part II-1. (8 points)**

**Q5. (8 points)**

Data Matrix 1

Character Taxa	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
T1	0	0	0	0	0	0	0	0	0	0	0
T2	1	0	0	0	0	1	0	0	1	1	0
T3	1	0	0	1	0	1	1	0	1	1	1
T4	1	1	0	0	0	1	1	0	1	1	1
T5	1	0	1	0	1	0	0	1	1	1	1
T6	1	0	0	0	0	0	0	1	1	1	1

1. 1 point per each character. (Deduct 0.15 point per box with wrong number.)

**Part II-2. (3 points)**

**Q6.** (3 points =  $0.25 \times 12$ )

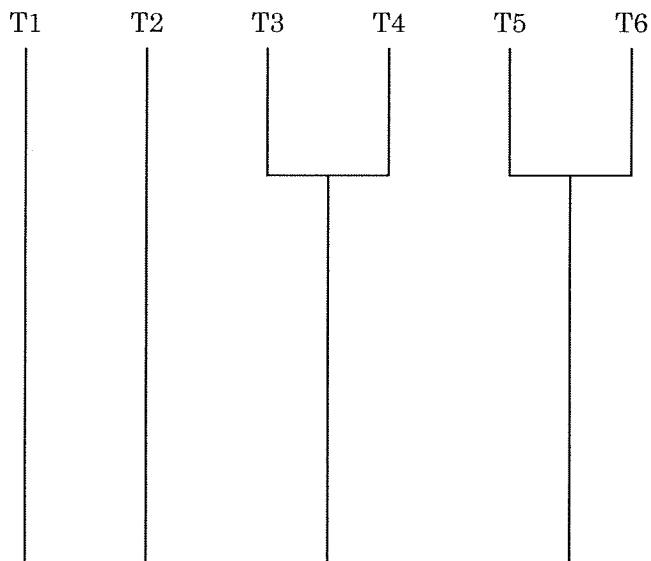
Difference Matrix 1

Dij	T1	T2	T3	T4	T5	T6
T1	-	-	-	-	-	-
T2	<b>4</b>	-	-	-	-	-
T3	7	3	-	-	-	-
T4	7	3	<b>2</b>	-	-	-
T5	7	5	6	6	-	-
T6	5	3	4	4	<b>2</b>	-

**Part II.3 (7 points)**

**Q7.1.** (1 point) (No partial score)

Tree 1: Combine and draw the two alternative trees as a single tree.

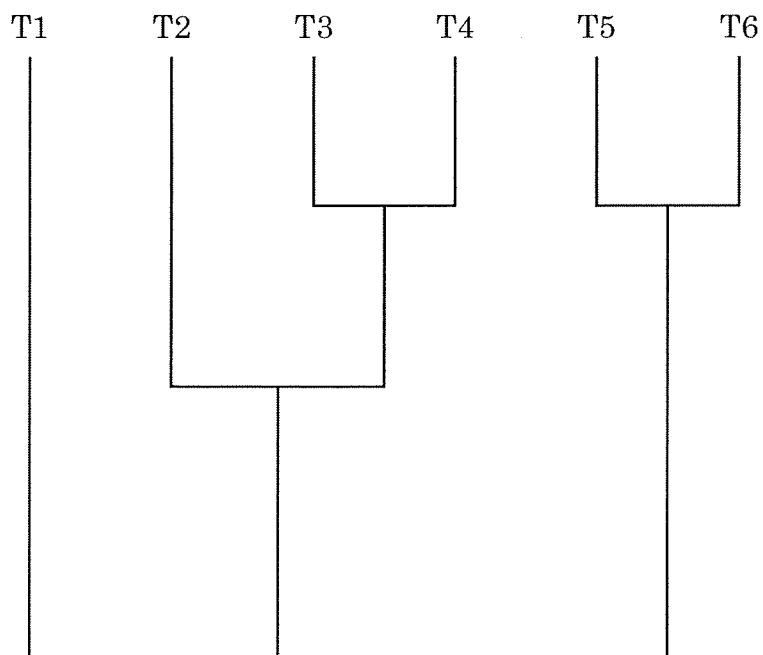


Q7.2. (2 points)

Difference Matrix 2 (1 point =  $0.2 \times 5$ )

<i>Dij</i> or <i>Dk(ij)</i>	T1	T2	T(3,4)	T(5,6)
T1	-	-	-	-
T2	4	-	-	-
T(3,4)	7	3	-	-
T(5,6)	6	4	5	-

Tree 2 (1 point) (No partial score)

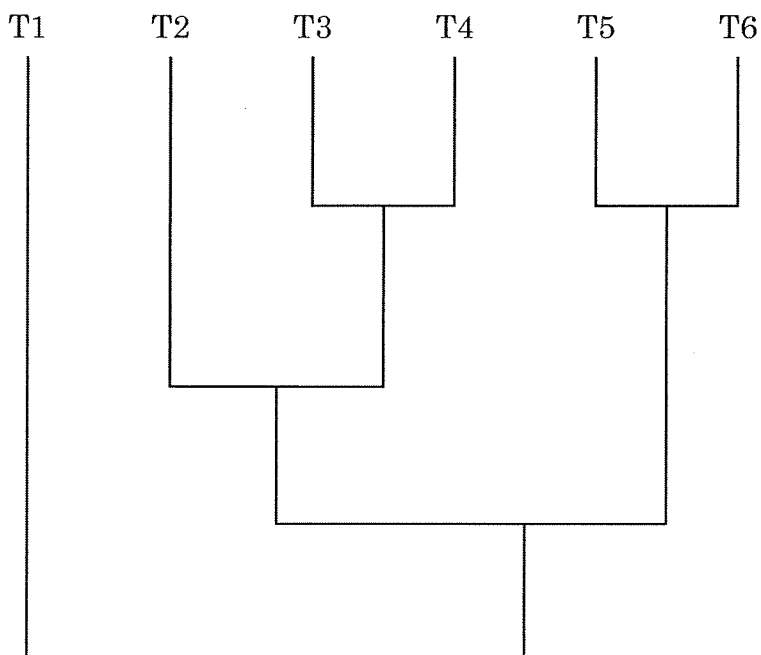


Q7.3. (2 points)

Difference Matrix 3 (1 point) (Deduct 0.1 point per box with wrong answer.)

$D_{ij}$ or $D_k(i,j)$	T1	T(2(3,4))	T(5,6)
T1	-	-	-
T(2(3,4))	5.5	-	-
T(5,6)	6	4.5	-

Tree 3 (1 point) (No partial score)



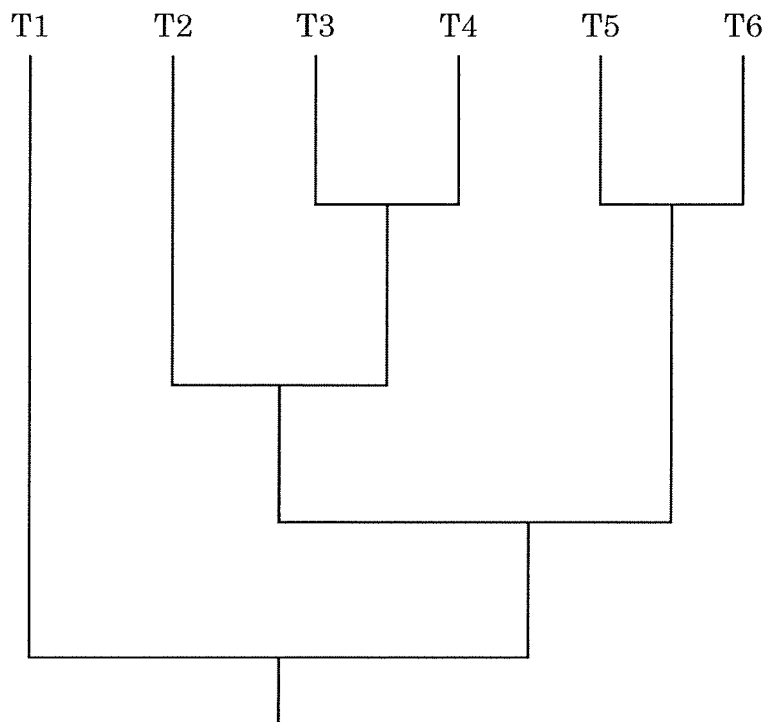


Q7.4. (2 points)

Difference Matrix 4 (1 point =  $0.2 \times 5$ )

$D_{ij}$ or $D_k(ij)$	T1	T(2(3,4),(5,6))
T1	-	-
T(2(3,4),(5,6))	5.75	-

Tree 4 (1 point) (No partial score)



**Task III. (7 points)**

**Q8.** (3 points = 1 × 3)

Insect Species	Plant Species
T1	F
T2	<b>E</b>
T3	<b>D</b>
T4	C
T5	<b>A</b>
T6	B

**Q9.** (2 points = 1 × 2)

Insect species	Plant species
T2	E

**Q10.** (2 points) (No partial score)

A	B	C	D	E
√			√	