

25th INTERNATIONAL BIOLOGY OLYMPIAD

5th – 13th July, 2014

INDONESIA



PRACTICAL TEST 3

ANIMAL ANATOMY, PHYSIOLOGY AND SYSTEMATICS

ANSWER SHEET

Total points: **93.5**

Duration: 90 minutes

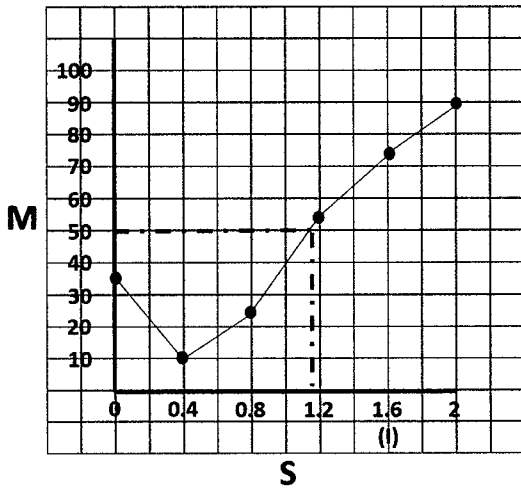
COUNTRY:
STUDENT:

Task (93.5 points)

Acute Response of Fish Larvae to Rapid Changes in Salinity to Salt Concentration, Calculation of LC₅₀, and Classification of Prawns

Part A. Acute Response of Fish Larvae to Rapid Changes in Salinity (12 points)

Q 1.1 and Q.1.2 (6 + 2 points)



Grading:

1. Six points for each perfect location of dot in the graphic
2. Additional 3 points for concentration of LC₅₀
3. Minus 2 point for mistake in any axis

Q 1.3. (2 points)

Mark the appropriate answer with a tick "✓"

A	B	C	D
			✓

Q 1.4. (2 points)

Mark the appropriate answer with a tick "✓"

A	B	C	D
			✓

Part B. Calculation of LC₅₀ (19.5 points)

Q 2.1 (4.5 points; @0.5) and Q2.2 (3 points; @0.5) (Note: student still get full point even if they add 2 decimal after mortality rate)

No	Concentration (µM)	Test Animals	Death	Mortality Rate (%)	Log ₁₀ Concentration (x)	Probit (y)	x ²	xy
1	10.2	50	44	88	1.01	1.18	1.02	1.19
2	7.7	50	42	84	0.89	0.99	0.79	0.88
3	6.5	50	35	70	0.81	0.52	0.66	0.42
4	5.1	46	24	52	0.71	0.05	0.5	0.04
5	4.4	50	22	44	0.64	-0.15	0.41	-0.1
6	3.8	50	16	32	0.58	-0.47	0.34	-0.27
7	3.2	50	11	22	0.51	-0.77	0.26	-0.39
8	2.6	50	6	12	0.41	-1.18	0.17	-0.48

Q 2.3 (4 points; @1)

ΣX	ΣY	ΣX ²	ΣXY
5.56	0.17	4.15	1.29

Q 2.4 (4 points)

a	b
-2.78	4.03

$-2,83 \pm 0.5$ $4,10 \pm 0.5$

Q 2.5 (4 points)

LC ₅₀ Concentration [μ M]
4.90 \pm 0.01

Part C. Classification of Prawns (62 points)

Q 3.1. (15 points @ 2.5 points)

Mark the appropriate answers with a tick "✓"

Species	SpA	SpB	SpC	SpD	SpE	SpF
<i>Funchalia villosa</i>						
<i>Funchalia woodwardi</i>						
<i>Litopenaeus vannamei</i>	✓					
<i>Macrobrachium australiense</i>						
<i>Macrobrachium koomboolomba</i>						
<i>Macrobrachium rosenbergii</i>				✓		
<i>Metapenaeopsis barbata</i>						
<i>Metapenaeus monoceros</i>		✓				
<i>Parapenaeus australiensis</i>						
<i>Parapenaeus sextuberculatus</i>						
<i>Penaeopsis eduardoi</i>						
<i>Penaeus merguensis</i>			✓			✓
<i>Penaeus monodon</i>					✓	
<i>Trachypenaeus curvirostris</i>						

Q 3.2 (22.5 points @0.25)

Mark presences with "1" and absences with "-"

Charact er	SpA	SpB	SpC	SpD	SpE	SpF
1	-	-	-	1	-	-
2	-	-	-	1	-	-
3	1	1	1	-	1	1
4	-	-	-	1	-	-
5	-	-	1	-	-	1
6	1	-	1	1	1	1
7	1	-	1	-	1	1
8	-	1	-	-	-	-
9	-	-	-	-	1	-
10	1	-	1	-	-	1
11	-	1	-	-	-	-
12	-	-	1	-	-	1
13	1	-	-	-	1	-
14	-	-	-	1	-	-
15	-	1	-	-	1	-

Iteration 2 (1 + 1 + 1.5 = 3.5 points)

1 point for correct label of table

1 point for correct calculation of age of newly formed cluster

0.25 point for each correct calculation of distance

	I-V			
I-V	0.00	II		
II	10.5	0.00	III-VI	
III-VI	6.5	10	0.00	IV
IV	12.5	11	11	0.00

Age of newly formed cluster
1.5

Iteration 3 (1 + 1 + 0.75 = 2.75 points)

1 point for correct label of table

1 point for correct calculation of age of newly formed cluster

0.25 point for each correct calculation of distance

	I-V-III-VI		
I-V-III-VI	0.00	II	
II	10.25	0.00	IV
IV	11.75	11	0.00

Age of newly formed cluster
3.25

Iteration 4 (1.25 points)

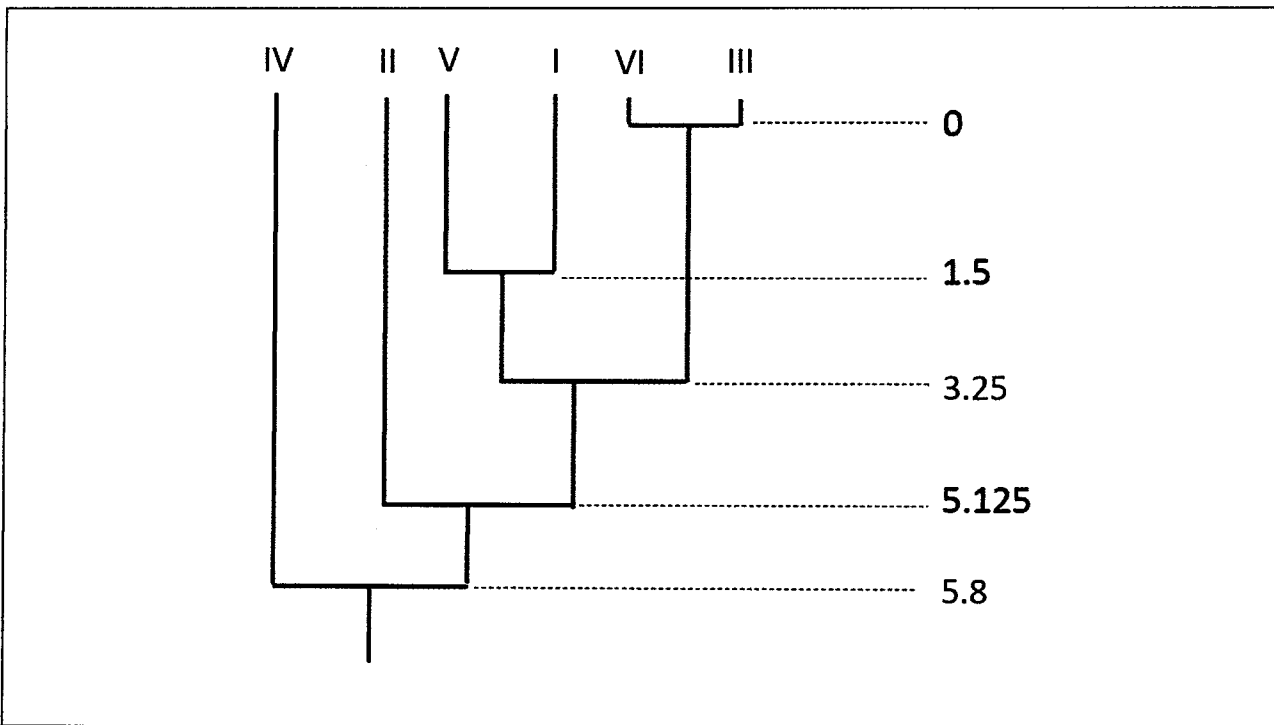
1 point for correct calculation of age of newly formed cluster

0.25 point for each correct calculation of distance

	I-V-III-VI-II	
I-V-III-VI-II	0.00	IV
IV	11.6	0.00

Age of newly formed cluster
5.125

Q 3.5 (5 points)



1 point for each correct position of specimen on the tree

0.2 point for each correct labelling of age on the tree

