

# Twenty-second International Linguistics Olympiad

Taipei (Taiwan), July 20–27, 2025

## Individual Contest Solutions

### Problem 1.

		1	2	3	4	5	6	7	8	9
$\boxed{k}$	$k$	ci	pi	sum	zi	ŋa	ɖu	dyn	ge	gu
	$10(+k)$	cu-	cu-	cu-	cy-	ce-	cu-	cup-	cop-	cy-
$\textcircled{k}$	$k \times 10$	cutām	pi-	sum-	zip-	ŋap-	ɖuk-	dyn-	gep-	(gup-)
$\textcircled{\textcircled{k}}$	$k \times 10(+\dots)$		tsa-	so-	ze-	ŋa-	(re-)	døn-	ja-	(go-)

#### • System A:

- $\beta \times 20 (+\alpha) = \text{ke } \boxed{\beta} (\text{da } \boxed{\alpha})$ 
  - \*  $\beta \times 20 + 10 \rightarrow \text{ke pje-da } \boxed{\beta + 1}$
  - \*  $\beta \times 20 + 15 \rightarrow \text{ke ko-da } \boxed{\beta + 1}$
- $\gamma \times 400 (+\beta \times 20 + \alpha) = \text{piɕu } \boxed{\gamma} (\text{da ke } \boxed{\beta} \text{ da } \boxed{\alpha})$ 
  - \*  $\gamma \times 400 + 200 \rightarrow \text{piɕu pje-da } \boxed{\gamma + 1}$
  - \*  $\gamma \times 400 + 300 \rightarrow \text{piɕu ko-da } \boxed{\gamma + 1}$

#### • System B:

- $\beta \times 10 = \textcircled{\beta}\text{-cu}, \beta > 2;$
- $\beta \times 10 = \textcircled{\beta}\text{-ɕu}, \beta = 2$
- $\beta \times 10 + \alpha = \textcircled{\textcircled{\beta}}\text{-}\boxed{\alpha}$
- $\gamma \times 100 (+\omega) = \textcircled{\gamma}\text{-ja } \omega$

- (a)  $[X] = 60 = \text{ɖukcu}$   
 $[Y] = 62 = \text{ke sum da pi}$   
 $[Z] = 885 = \text{piɕu pi da ke zi da ŋa}$

- (b) (1)  $13 + 70 = 83$   
(2)  $800 = 20 \times 40$   
(3)  $469 = 50 \times 9 + 19$   
(4)  $600 + 110 = 500 + 210$   
(5)  $2 \times \frac{3}{4} + \frac{1}{2} = 2$   
(6)  $1100 \times \frac{1}{2} + 50 = 600$   
(7)  $736 = 84 \times 4 + 400$   
(8)  $2 \times 609 = 60_X \times 20 + 18$   
(9)  $62_Y + 24 = 86$   
(10)  $885_Z + 115 = 700 + 300$

- (c) •  $75 = \text{ke ko-da zi} = \text{dønŋa}$   
•  $570 = \text{piɕu ci da ke pje-da gu} = \text{ŋapja dyncu}$

**Problem 2. Rules:**

- Word order:
  - inalienable possession: possessor + noun
  - alienable possession: noun + possessor
- Possessive pronouns:

	inalienable possession		alienable possession	
	kinship term	body part	singular	plural
singular	$\check{V}^*$	$\bar{V}$	$\check{V}\check{V}n$	$\check{V}n\check{V}g$
plural	$\bar{V}g$		$\bar{V}y\check{V}n$	$\bar{V}y\check{V}g$
person marking	$V: 1/2/3 \rightarrow a/o/\epsilon$		$V: 1/2/3 \rightarrow a/u/i$ 3 $\rightarrow$ add a suffix $-i$	

\* High tone is only applicable for first and second person.

- Noun plural formation:
  - **-(vv)d** for kinship terms, **-(vv)g** otherwise. **VV** is an unpredictable epenthetic vowel.
  - When an epenthetic vowel is added, the tone pattern may spread out or change slightly.
  - When a (plural) body part is possessed by a plural pronoun, the tone pattern of the noun is fully replaced by a  $\grave{e}(\grave{o})\bar{e}$  tone contour.

(a)

1	J	2	A	3	D	4	T	5	E	6	S	7	F	8	B	9	P	10	L
11	H	12	N	13	G	14	M	15	Q	16	K	17	O	18	I	19	C	20	R

(b) *his grandmother, his grandfather* –  $\epsilon$  does not have high tone before kinship terms.

- (c)
21.  $\bar{a}g\ b\grave{o}\grave{o}r\bar{a}\bar{a}g$  – *our shoulders*
  22.  $q\grave{d}\bar{o}r\acute{e}\acute{e}g\ \bar{a}y\grave{a}g$  – *our hammers*
  23.  $\bar{e}\ b\bar{o}\bar{o}r\grave{a}\grave{a}g$  – *his shoulders*
  24.  $\bar{o}\ t\acute{u}nd\acute{u}l\grave{i}g$  – *your<sub>sg</sub> elbows*
  25.  $\acute{o}\ m\acute{a}\grave{a}m$  – *your<sub>sg</sub> aunt*

- (d)
26. *my grindstone* –  $g\grave{u}\grave{u}r\ \acute{o}\grave{e}n$
  27. *their cheeks* –  $\bar{e}g\ f\grave{a}nd\bar{a}g$
  28. *your<sub>pl</sub> anchor* –  $t\acute{e}\acute{e}l\ \bar{u}y\grave{u}n$
  29. *our uncle* –  $\bar{a}g\ \bar{a}b\acute{e}\acute{e}$
  30. *your<sub>sg</sub> dogs* –  $\acute{a}\check{d}\acute{a}g\ \acute{u}n\grave{u}g$

**Problem 3. Rules:**

- Word order: verb (object).
  - Verb:
    - ‘indeed’: **n-**
    - subject: **-n-** 1st person sg, **-to-** 1st person pl, **-a-** 3rd person sg, **-βa-** 3rd person pl
    - tense: **-ra-** ‘about to’, **-V-** past
    - stem
  - **-n-V-** > **-naa-**, else **-V-** = preceding vowel; **nβ** > **mb**; **nr** > **nd**
  - Tone contours:
    - ‘about to’: ̀̀̀̀̀́
    - past: ̀̀̀́
    - past + ‘indeed’, present: ́
  - Tone assignment:
    1. All vowels are initially ̀.
    2. Assign tones to vowels one-to-one starting from first vowel of stem, continuing on to object if it exists.
    3. If final vowel reached and more than one tone remains:
      - ̀́ → assign ́ to final vowel.
      - ...̀̀̀́ → assign ̀ to final vowel.
    4. All vowels following ́ are assigned ́.
    5. Sentence-final ́́ → ́̀.
- (a) 20. **ahéétóka**
- (b) 21. **βaasukurá** — *They have rubbed (something).*  
 22. **toosya itʃíimbéyo** — *We have ground the seeds.*  
 23. **ndóma** — *I bite (something).*  
 24. **naaβína** — *Indeed, he has sung (something).*
- (c) 25. *We are about to eat the seeds.* — **torarya itʃíimbéyo**  
 26. *I sing (something).* — **mbína**  
 27. *Indeed, we have measured the secretary bird.* — **ntooβíímá írítáárákímúra**  
 28. *We are about to burn (something).* — **torasaambă**  
 29. *He has remembered (something).* — **aaheetóka**

Problem 4.

(a)

15	D.	16	N.	17	T.	18	L.	19	W.
20	O.	21	Y.	22	H.	23	I.	24	G.
25	A.	26	Q.	27	C.	28	V.	29	P.
30	K.	31	U.	32	F.	33	M.	34	E.
35	J.	36	X.	37	S.	38	R.	39	B.

(b)

- 40. **repena** — *tree; fire*
- 41. **agaa** — *mouth; speech*
- 42. **iri** — *hair; grass*
- 43. **yagaa** — *jaw*
- 44. **nida dia** — *it is not me*
- 45. **yaa-iri** — *bird feathers*
- 46. **nogo-naaki** — *children*

(c)

- 47. *white man* — **bali**
- 48. *bone* — **uni**
- 49. *seed of a tree* — **repena-ini**
- 50. *hole* — **boke**
- 51. *very big* — **ora adaa**
- 52. *pandanus* — **aga**
- 53. *old woman's eye* — **pamoagaena ini**

**Problem 5. Rules:**

- Word order: VXY, XVY ( $\{X, Y\} = \{S, O\}$ ; V = verb, S = subject, O = object)

- Noun: ri (pl: taq) N

- Verb: x-

	O	S
sg	—	ru
pl	e	ki

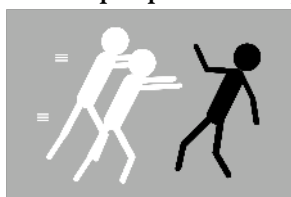
-stem; before a vowel ru- > r-, ki- > k-

- |                           |        |    |                            |       |
|---------------------------|--------|----|----------------------------|-------|
|                           |        |    | Auditory Cortex (activity) |       |
|                           |        |    | higher                     | lower |
|                           |        |    | VXY                        | XVY   |
| Frontal Cortex (activity) | higher | VS | VSO                        | OVS   |
|                           | lower  | VO | VOS                        | SVO   |

**Answers:**

- (a)
1. Xerunim ri taq saq ri xar
  2. Ri taq [q'eq]<sub>A</sub> xkich'ay [ri]<sub>B</sub> kaq
  3. [Xeroyo]<sub>C</sub> ri q'eq ri taq kaq
  4. Ri q'eq xkoyo [ri taq xar]<sub>D</sub>
  5. [Xkinim ri taq kaq]<sub>E</sub> ri saq
  6. Xkich'ay [ri xar ri taq saq]<sub>F</sub>
  7. [Ri taq xar]<sub>G</sub> xeroyo [ri kaq]<sub>H</sub>
  8. [Ri saq xeruch'ay ri taq q'eq]<sub>I</sub>

- (b) 9. Ri taq saq xkinim ri q'eq    10. Xekich'ay ri taq xar ri taq kaq



- (c)
- Xroyoj ri saq ri xar
  - Xroyoj ri xar ri saq
  - Ri xar xroyoj ri saq
  - Ri saq xroyoj ri xar

- (d)

		Frontal Cortex (activity)	Auditory Cortex (activity)
11	Xeruq'etey ri kaq ri taq q'eq	higher	higher
12	Xerachik'aj ri taq saq ri xar	lower	higher
13	Ri taq q'eq xekitz'et ri taq saq	?	lower