

## Eighteenth International Linguistics Olympiad

Ventspils (Latvia), July 19–23, 2021

Individual Contest Solutions

### Problem 1.

- ena 1, wija 2, wido 3, wi 4, idibi 5, benomi 6, waroewo 8, ije 9
- rati 10, mepina 20, joka rati 30, mepija 40, rati beo 50, moeto 60
- $\alpha$ -ma  $10\beta = 10\beta + \alpha$  ( $1 \leq \alpha \leq 9$ ,  $1 \leq \beta \leq 5$ )
- ije  $10(\beta + 1) = ijema$   $10\beta$  ( $1 \leq \beta \leq 5$ )
- $\gamma$  daemita moeto =  $60 + \gamma$  ( $1 \leq \gamma \leq 59$ )
- moeto  $\delta$  [ma  $\gamma$  ka  $(\delta + 1)$ ] =  $60\delta$  [+ $\gamma$ ] ( $1 \leq \gamma \leq 59$ ,  $2 \leq \delta \leq 5$ )

(a) moeto waroewo 480  
 ijema joka rati 39  
 moeto wido ma benomi ka wi 186

(b) 1 ena  
 19 ijema rati = ije mepina  
 26 benomima mepina  
 104 wima mepija daemita moeto  
 292 moeto wi ma wijama rati beo ka idibi

### Problem 2.

- -ya collectivity: homa- ‘juniper leaf’ + -ya → homa-ya- ‘juniper branch’
- N:-N (N = noun):  
 ha- ‘leaves’ + k’yawe ‘water’ → ha:-k’yawe ‘tea’
- N:-A (A = adjective):  
 mu- ‘bread’ + chikwa ‘sweet (adj.)’ → mu:-chikwa ‘chocolate bar’

	singular	plural, substance
monosyllabic stem	-’le	-we
polysyllabic stem	-nne	-:we

- (a) 1. mo:chikwa datda:we — I. peach trees  
 2. haya:we — G. lit. piles of leaves (actually planted fields [fields of plants])  
 3. doko:ko mo’le — H. chicken egg  
 4. ma:chikwa — C. sugar  
 5. mu:chikwa — J. chocolate bar  
 6. mulonne, mu’le — D. loaf of bread  
 7. mowe — E. beads  
 8. ha:k’yawe — B. tea  
 9. doko:ko shiwe — A. chicken meat  
 10. mo:chikwa mulo:chikwa — F. peach pie

- (b) 11. **ade muwe** — O. *blood clots*  
 12. **beyanne** — P. *field of grass*  
 13. **homa:we** — M. *juniper leaves*  
 14. **ma:k'yawe** — N. *salt water*  
 15. **ma:k'ose** — S. *salt*  
 16. **ma'le** — K. *granule, grain*  
 17. **homayanne** — R. *juniper branch*  
 18. **mi'le** — L. *ear of corn [corn cob]*  
 19. **ade k'yawe** — Q. *blood*
- (c) 20. **be'le** — *blade of grass*  
 21. **chikwa** — *sweet (adj.)*  
 22. **datdanne** — *tree*  
 23. **ade = ade k'yawe** — *blood*  
 24. **mulo:we** — *bread*  
 25. **hawe** — *leaves*
- (d) 26. *salty* — **k'ose**  
 27. *juniper leaf* — **homanne**  
 28. *piece of meat* — **shi'le**  
 29. *water* — **k'yawe**  
 30. *corn, maize* — **miwe**  
 31. *fields of grass* — **beya:we**
- (e) *salt lake.*

**Problem 3.**

- Word order:
  - V(O)S (V = verb; O = object; S = subject)
  - QVX (Q = interrogative element)
  - (*which* | Qt)N(D)(A) (Qt = quantity, N = noun, D = demonstrative pronouns, A = adjective)
- verb:
  - **le-** past
  - **bi-** future
  - **-si** subject = plural (**-gisi-si** > **-gisesi**)
- noun:
 

	singular	plural
<i>man</i>	<b>tau</b>	<b>tauwau</b>
<i>child</i>	<b>gwadi</b>	<b>gugwadi</b>
<i>chief</i>	<b>guyau</b>	<b>gweguyau</b>
<i>old woman</i>	<b>namwaya</b>	<b>nunumwaya</b>
~	singular = plural	
- class (Cl):
  - men: **te-** (before Qt); **to-**
  - women/animals: **na-**
  - children: **gudi-**
  - canoes: **ke-**
  - things (for example stones): **kwe-**
- demonstrative pronouns: **(a-)ma-Cl(-si)(-we)-na**, **ma-to-** > **mto-**, **ma-na-** > **mina-**
- quantity: Cl-**vila** *how many?*, Cl-**tala** 1, Cl-**yu** 2, Cl-**vasi** 4

- (a) 14. **Navila vivila biyamata tomwaya mtona?**  
*How many women will this old man look after?*
15. **Bikamkwamsi kweyu vivila minasina.**  
*These women will eat two things.*
16. **Amagudina gwadi lekota?**  
*Which child arrived?*
17. **Tevila tauwau bigisesi gugwadi gudigasisi?**  
*How many men will see the wild children?;*  
*How many men will the wild children see?*
18. **Legisesi ketala waga vivila minasiwena.**  
*Those women saw one canoe.*
- (b) 19. *How many canoes did those old women see?*  
**Kevila waga legisesi nunumwaya minasiwena?**
20. *These four white men will look after this clever child.*  
**Biyamatasi gwadi magudina gudikabitam tevasi dimdim mtosina.**
21. *How many children will eat these pigs?*  
**Gudivila gugwadi bikamkwamsi bunukwa minasina?**
22. *Which woman caught those beautiful fish?*  
**Aminana vivila lebani yena minasiwena namanabweta?**
23. *Two wild dogs saw that old man.*  
**Legisesi tomwaya mtowena nayu ka'ukwa nagasisi.**

**Problem 4.** tV- before CV<sub>0</sub>:

	C = y	C ∉ {b, m, w, y}		C ∈ {b, m, w}
		V <sub>0</sub> ∈ {e, ε, i, I}	V <sub>0</sub> ∈ {o, o, u, u, a}	
V <sub>0</sub> ∈ {e, i, o, u}		V = i		V = u
V <sub>0</sub> ∈ {ε, o, I, u, a}		V = I		V = o

•  $\tilde{V} \leftrightarrow \tilde{V}_0$

•  $\overset{\curvearrowright}{\text{CV}_0} > \overset{\curvearrowright}{\text{tV-CV}_0}$  ;  $\overset{\curvearrowright}{\text{CV}_0} > \overset{\curvearrowright}{\text{tV-CV}_0}$  ;  $\overset{\curvearrowright}{\text{CV}_0} > \overset{\curvearrowright}{\text{tV-CV}_0}$

•  $\text{N-CV}_0$  (N ∈ {m, n, j, ŋ}) > n-tV-CV<sub>0</sub>

(a)  $\acute{t}\acute{i}\acute{m}\acute{i}\acute{t}\acute{i}\acute{n}\acute{i}$  (\* $\acute{t}\acute{u}\acute{m}\acute{i}\acute{t}\acute{i}\acute{n}\acute{i}$ )

- (b) 1. rôtô — tórótótò  
2. rèwǒ — tìrètǒwǒ  
3. bíkó — túbitúkó  
4. jýé riyà — nítíyé tiritìyà  
5. békʷǒ — tóbétǒkʷǒ  
6. ríyòrò — tírítíyòtùrò  
7. hʷǒgà — tòhʷǒtógà

**Problem 5.** Verb structure:

subject		tense		(object-)	root	(-subject)			
$\emptyset$ -	1st person sg	<b>my</b> - <sup>C</sup>	} future	<b>ik</b> - 1st person sg		<b>-naha</b> 1st person pl			
	3rd person sg <sub>future</sub>						<b>p</b> - <sup>V</sup>		
<b>tsi</b> - <sup>C</sup>	2nd person sg	<b>ik</b> - <sup>C</sup>	} past						
	1st person pl						$\emptyset$ - <sup>V</sup>		
<b>ts</b> - <sup>V</sup>							<b>aha</b> - 2nd person pl		
		<b>ni</b> - <sup>C</sup>	} 3rd person sg <sub>past</sub>				<b>si</b> - 3rd person pl		
		<b>z</b> - <sup>V</sup>							

$\emptyset$ -**p-ik**- = 3rd person sg<sub>future</sub> : 1st person sg (not \*1st person sg<sub>future</sub> : 1st person sg)  
<sup>C</sup> = before a consonant, <sup>V</sup> = before a vowel

- (a) **aharapyryk**    *I hugged you*  
**mymyboro**    *he will bite us* (not ??*I will bite us*)  
**uru**    *I slept*  
**tsiksiwynaha**    *we cut them up* (past)  
**ikwak**    *I hunted*  
**ziksi**    *he left*

- (b) *we will fall*    **tsimynarahanaha**  
*I bathed*    **ikmoro**  
*you<sub>sg</sub> bit us*    **tsikmyboro**  
*I will wait for them*    **mysipery**  
*he will wait for them*  
*I will hug you<sub>pl</sub>*    **pahaharapyryk**  
*he will hug you<sub>pl</sub>*  
*you<sub>sg</sub> will leave*    **tsipiksi**  
*I killed it*    **ibeze**