Thirteenth International Olympiad in Linguistics

Blagoevgrad (Bulgaria), 20–24 July 2015

Individual Contest Solutions

Problem 1. Nahuatl:

- 1: *cë*, 2: *öme*, 3: *ëyi*, 4: *nähui*;

- 5: *mäcuïlli*, 10: *mahtlactli*, 15: *caxtölli*;

- $\alpha \times 20^{\beta}, 1 \le \alpha \le 5, 1 \le \beta \le 3$:

α	
1:	*ceM*
2:	*öm*
3:	*yë*
4:	*näuh*
5:	*mäcuïl*

-

20^{β}	
20:	*pöhualli*
400:	*tzontli*
8000:	*xiquipilli*

;

- 7: *chicöme*;

- $\gamma + \delta, \left\{ \begin{array}{l} \gamma \in \{10, 15\}, 1 \le \delta \le 4 \\ \gamma = \alpha \times 20^{\beta}, 1 \le \delta < 20^{\beta} \end{array} \right\}$: $\boxed{\gamma}$-oM-$\boxed{\delta}$,

  $M = \left\{ \begin{array}{ll} m & \text{before } m, p, \text{ or a vowel}; \\ n & \text{otherwise}. \end{array} \right.$

Arammba:

- 1: ngámbi, 2: yànparo, 3: yenówe, 4: asàr, 5: tambaroy, 6: nimbo;

- $\alpha \times 6, 2 \le \alpha \le 5$: $\boxed{\alpha}$ tàxwo;

- $6^2 = 36$: fete, $6^3 = 216$: tarumba, $6^4 = 1296$: ndamno, $6^5 = 7776$: weremeke;

- $\alpha \times 6^{\beta}, 2 \le \beta$: $\boxed{\alpha}\ \boxed{6^{\beta}}$;

- $\alpha \times 6^{\beta} + \delta, 0 < \delta < 6^{\beta}$: $\boxed{\alpha \times 6^{\beta}}\ \boxed{\delta}$.

(a)

$$\overset{10+1}{11} \times 10 = \overset{5 \times 20 + 10}{110} \quad (1)$$

$$\overset{1 \times 20}{20} \times 2 = \overset{2 \times 20}{40} \quad (2)$$

$$\overset{3 \times 20 + (5+2)}{67} + \overset{10+4}{14} = \overset{4 \times 20 + 1}{81} \quad (3)$$

$$5 + 2 = 7 \quad (4)$$

$$\overset{10+3}{13} \times 3 = \overset{1 \times 20 + (15+4)}{39} \quad (5)$$

$$5 \times 3 = 15 \quad (6)$$

$$1 + 1 = 1 \times 2 \quad (7)$$

$$1 + 4 = 5 \quad (8)$$

$$\overset{2 \times 6}{12} + \overset{36 + 4 \times 6}{60} = \overset{2 \times 36}{72} \quad (9)$$

$$3 \times \overset{3 \times 6}{18} = \overset{36 + 3 \times 6}{54} \quad (10)$$

$$6 \times 36 = 216 \quad (11)$$

$$6 + \overset{2 \times 6}{12} = \overset{3 \times 6}{18} \quad (12)$$

$$\underset{3 \times 400 + 4 \times 20 + (15+1)}{1296} = 1296 \tag{13}$$

$$\underset{1 \times 400 + 1 \times 20 + (10+2)}{432} = \underset{2 \times 216}{432} \tag{14}$$

$$\underset{1 \times 400}{400} = \underset{216 + 5 \times 36 + 4}{400} \tag{15}$$

$$\underset{1 \times 8000}{8000} = \underset{7776 + 216 + 6 + 2}{8000} \tag{16}$$

(b)
- $42 = 2 \times 20 + 2$: *öm-pöhualli-om-öme*;
- $494 = 1 \times 400 + 4 \times 20 + 10 + 4$: *cen-tzontli-on-näuh-pöhualli-om-mahtlactli-on-nähui*.

(c)
- $43 = 36 + 6 + 1$: fete nimbo ngámbi;
- $569 = 2 \times 216 + 3 \times 36 + 4 \times 6 + 5$: yànparo tarumba yenówe fete asàr tàxwo tambaroy.

Problem 2. Structure of the verb form:

I.
> - **me-**: affirmative form, present, indicative mood,
>
> - ROOT,
>
> - **-pe** 'really', **-fe** 'pretend to', **-f** 'be able to', **-n** — infinitive.
>
> In this part of the word:
>
> 1. C + -C > CəC (**de + -f + -n > de-f-ə-n**, **me- + bəb + -pe > me-bəb-ə-pe**).
>
> 2. The last syllable receives the stress if it is closed, otherwise the penultimate is stressed (**defən > defə́n**, **mešxepe > mešxépe**).
>
> 3. CéC(C)e > CáC(C)e (**méšxe > mášxe**, **mešxépe > mešxápe**).

II.   **-xe** — plural, **-t** — past, **-me** — conditional mood, **-q̇əm** — negative form.

Answers:

(a)
ʒeq̇én	*to bite*
medéf	*(he/she) is able to sew*
medáfe	*(he/she) is pretending to sew*
səfə́n	*to be able to burn*
megʷəš'ə́ʔe	*(he/she) is speaking*
mebə́b	*(he/she) is flying*

(b)
çentχʷéfme	*if (he/she) is able to slide*
šxáfexeq̇əm	*(they) aren't pretending to eat*
bəbə́ft	*(he/she) was able to fly*
šxet	*(he/she) was eating*
ṭəgʷərəgʷə́peme	*if (he/she) really is trembling*

(c)   **mádexe**   *(they) are sewing*
       mebəbə́fexe   *(they) are pretending to fly*
       sə́pet   *(he/she) really was burning*
       šxéfq̇əm   *(he/she) isn't able to eat*
       gʷəš'ə́ʔexeme   *if (they) are speaking*
       meӡáq̇exe   *(they) are biting*

Problem 3.

(a)   1. Leave the first letter in place.

     2. Delete *h* and *w*.

     3. Replace all consonant letters with digits (letters whose most common sounds are similar are grouped together):

bpv (f)	cgjkqs (xz)	dt	l	mn	r
1	2	3	4	5	6

     4. Reduce any sequence of two or more identical digits to a single digit.

     5. Delete all vowels (*a, e, i, o, u, y*).

     6. Leave only the first three digits or add zeroes on the right to make the code one letter and three digits long.

(b) *Allaway*: A400, *Anderson*: A536, *Ashcombe*: A251, *Buckingham*: B̲252,
     Chapman: C155, *Colquhoun*: C425, *Evans*: E152, *Fairwright*: F̲623,
     Kingscott: K̲52̲3, *Lewis*: L20̲0, *Littlejohns*: L̲342, *Stanmore*: S356,
     Stubbs: S312, *Tocher*: T2̲60̲, *Tonks*: T520, *Whytehead*: W̲330.

(c) *Ferguson*: F622, *Fitzgerald*: F326, *Hamnett*: H530, *Keefe*: K100,
     Maxwell: M240, *Razey*: R200, *Shaw*: S000, *Upfield*: U143.

Problem 4.   Rules:

- Word order: V P (S/O); S/O P V Poss, V P Poss; S Poss.

- V = verb (past → future: **-bi** → **-ba**, ∅ → **-jba**).

- S = subject (noun). The subject of a transitive verb gets the ending **-ni**.

- O = object (noun).

- P = pronouns (subject + object) + tense:

     – subject:

       * 1st **ngV-**,
       * 2nd **nyV-**,

       * 3rd $\begin{cases} \text{intransitive verb:} & \textbf{\textit{gV-}} \\ \text{transitive verb:} & \begin{cases} \text{masculine} & \textbf{\textit{gVnV-}} \\ \text{feminine} & \textbf{\textit{ngVyV-;}} \end{cases} \end{cases}$

     – object: 1st **-ngV**, 2nd **-nyV**, 3rd -∅;

    – ***V*** are vowels (past: ***i, ..., i, a***; future: ***u, ..., u***).

- Poss = possessed: $\left\{\begin{array}{l} \text{`+':} \quad \textbf{\textit{-ngu}} \\ \text{`-':} \quad \textbf{\textit{-wa}} \end{array}\right\}$ $\left\{\begin{array}{ll} \multicolumn{2}{l}{\text{possessor}} \\ \hline \text{masculine:} & \textbf{\textit{-ji}} \\ \text{feminine:} & \textbf{\textit{-nya}} \end{array}\right\}$

(a)

1.	***Alayulujba nguyunyu bungmanyani.***	The old woman will find you (sg.).
2.	***Yagu gininya.***	He left you (sg.).
3.	***Janji darrangguwaji.***	The dog doesn't have a stick.
4.	***Ngirra nya alanga.***	You (sg.) stole the girl.
5.	***Daguma nyinga.***	You (sg.) struck me.
6.	***Dirragbi ga balamurrungunya.***	She jumped with the spear.

(b)

7.	You (sg.) will leave me.	***Yagujba nyungu.***
8.	The doctor slept.	***Gulugbi ga ngunybulugi.***
9.	The man will run (away) with the money.	***Juwa gu bardba gijilulunguji.***
10.	He will steal the dog.	***Ngirrajba gunu janji.***
11.	The girl saw you (sg.).	***Ngajbi ngiyinya alangani.***

Problem 5.

(a) $(\circ)\dfrac{\overset{\text{oo oo}}{\quad\quad}}{\underset{\text{oo}}{\quad}\ \underset{\text{oo}}{\quad}} \circ \dfrac{\overset{\text{oo oo}}{\quad\quad}}{\underset{\text{oo}}{\quad}\ \underset{\text{oo}}{\quad}},$ $\begin{array}{l} \circ = \text{V (a, e, i, o, u)} \\ \text{oo} = \text{VV (aa, ee, ii, oo, uu)} \end{array}$

(b)

36.	war	is—maa—ciil				daa-	rood	×
37.		dir mi-	yaad	wa-		daag-	taan	√
38.		laba-	daad	ka		duu-	diye	√
39.		ka jan-	na-daad			daa-	hiye	×
40.		adi-	ga i-	yo		deris-	kaa	√
41.		diga-	xaar-	ka		mari-	yoo	√
42.		ciid i-		yo doo-		lo di-	raac	×
43.		noo-		ma kee-		neen	darka	×
44.	ka-	la de-	yaa-		yaa mi-		yaan	×
45.	wu-	xuun	kaa	dan-		qaa-	baan	√