

Seventh International Olympiad in Theoretical, Mathematical and Applied Linguistics

Wrocław (Poland), 26–31 July 2009

Individual Contest Problems

Rules for writing out the solutions

1. Do not copy the statements of the problems. Write down your solution to each problem on a separate sheet or sheets. On each sheet indicate the number of the problem, the number of your seat and your surname. Otherwise your work may be mislaid or misattributed.
2. Your answers must be well-argumented. Even a perfectly correct answer will be given a low score unless accompanied by an explanation.

Problem #1 (20 points). The following are phrases in English and their translations into the Sulka language:

1 betel nut	<i>a vhoi a tgiang</i>
1 yam	<i>a tu a tgiang</i>
2 betel nuts	<i>a lo vhoi a lomin</i>
2 coconuts	<i>a lo ksie a lomin</i>
3 betel nuts	<i>o vuo a korlotge</i>
3 breadfruits	<i>a moulang hori orom a tgiang</i>
4 yams	<i>o sngu a korlolo</i>
6 yams	<i>o sngu a ktiék hori orom a tgiang</i>
7 betel nuts	<i>o vuo a ktiék hori orom a lomin</i>
10 breadfruits	<i>a lo ngaitegaap hori orom a moulang</i>
10 coconuts	<i>a lo ngausmia hori orom a lomin</i>
10 yams	<i>o sngu a lo ktiék</i>
15 coconuts	<i>o ngausmia a korlotge hori orom a korlotge</i>
16 coconuts	<i>o ngausmia a korlolo</i>
18 breadfruits	<i>o ngaitegaap a korlolo hori orom a moulang</i>
18 yams	<i>o sngu a lo ktiék hori orom a ktiék hori orom a korlotge</i>
19 betel nuts	<i>o vuo a lo ktiék hori orom a ktiék hori orom a korlolo</i>
20 yams	<i>o sngu a mhelom</i>

(a) Translate into English:

a ksie a tgiang
o ngaitegaap a korlotge
o ngausmia a ktiék
o vuo a lo ktiék hori orom a tgiang

(b) Translate into Sulka:

2 yams
14 yams
15 breadfruits
20 betel nuts

⚠ Sulka belongs to the East Papuan language family. It is spoken by approx. 3500 people in East New Britain Province in Papua New Guinea.

Betel nuts are actually seeds of a certain kind of palm. Yam is the edible tuber of the tropical plant of the same name.

—Evgenia Korovina, Ivan Derzhanski

Problem #2 (20 points). The following are words of the Maninka and Bamana languages written in the N'Ko and the Roman script and their English translations:

(a)

ԿՎԱՐԴԻՎԻՐ	bàlákàwúli	unexpectedness; sandgrouse (a kind of bird)
սԵՒԽԱԾ	játùrú	hyena
ԿՀՎԳՒԲ	kòlijí	washing water
ՎՐ	wàlá	slate
ԼԵՅՈՒԱՒ	kúmayira	advertising
ԿՒՂԱՅԻԲԻՒՆ	tùbabumóri	Christian priest
ԵՒՄԻՎՎ	?	uncircumcised boy
ՎՐԱՆ	?	match-seller
?	kòrikóri	rust
?	báwò	because

(b)

ይኞትል	márajàba	hail!
ሳንዋሱ	jílasama	hippopotamus
ሸጊትዬቻ	kòrøkarasí	gerontocracy
ካና	kàna	may it be that
ለለቃሽ	bàsitéme	wide-meshed sieve
ኝነትከላሽ	nàmátòrokó	hyena
ዓቅዕሜ	?	rainbow
አላፊ	?	light (of a lamp)
ባፋገ-ባሽ	?	a kind of midges; honey from such midges
?	jàmanaké	the joys, pleasures of youth
?	létére	letter, missive
?	bìlakóro	uncircumcised boy

Fill in the gaps.

⚠ The N’Ko script was invented in 1949 by the Guinean enlightener Soulemayne Kante.

In the Roman script $\mathbf{j} = j$ in *judge*, $\mathbf{y} = y$ in *yay!*, $\mathbf{\epsilon} \approx a$ in *hat*, $\mathbf{\circ} \approx a$ in *hall*. The marks $\mathbf{\acute{e}}$ and $\mathbf{\grave{e}}$ indicate high and low tone (level of voice when pronouncing the syllable), respectively; if neither is present, the syllable has middle tone.

The Bamana and Maninka languages belong to the Manding group of the Mande language family. They are spoken in Mali, Guinea and other countries in West Africa. These languages are very close to one another; the distinction between them is of no consequence to the problem.

—Ivan Derzhanski

Problem #3 (20 points). Here are the names of 24 Burmese children and their dates of birth:

boys		girls	
name	date of birth	name	date of birth
kaun̥ mya?	06/01/2009	paŋ we	06/04/2009
zeiya cɔ	06/09/2009	thouŋ uŋ	06/06/2009
pyesouŋ aŋ	06/18/2009	khiŋ le nwe	06/08/2009
ne liŋ	06/20/2009	wiŋ i muŋ	06/10/2009
lwiŋ koko	06/24/2009	mimi khaiŋ	06/18/2009
phouŋ naiŋ thuŋ	06/25/2009	su mya? so	06/30/2009
myo khiŋ wiŋ	07/02/2009	susu wiŋ	07/07/2009
tiŋ mauŋ la?	07/04/2009	yadana u	07/08/2009
khaiŋ miŋ thuŋ	07/06/2009	tiŋ za mo	07/11/2009
wiŋ cɔ aŋ	07/08/2009	yin̥yin̥ myin̥	07/15/2009
the? aŋ	07/11/2009	kepi thuŋ	07/20/2009
shaŋ thuŋ	07/21/2009	shu man̥ cɔ	07/21/2009

On 06/14/2009, 06/16/2009, 06/24/2009, 07/09/2009, 07/13/2009, and 07/18/2009 six other Burmese children were born. Here are their names:

- boys: ɲwe siŋbu, so mo cɔ, ye aŋ naiŋ
- girls: daliya, e tiŋ, phyuphyu wiŋ

Who was born when?

⚠ The Burmese names are given in a simplified Roman transcription. **c** = *ch* in *church*, **ɛ** ≈ *a* in *hat*, **h** indicates that the preceding consonant is aspirated (pronounced with a puff of air), **ŋ** = *ng* in *hang*, **ɳ** indicates that the preceding vowel is nasal, **ɔ** ≈ *a* in *hall*, **b** ≈ English *th* in *with*, **y** = *y* in *yay!*, **?** is a consonant (the so-called glottal stop).

—Ivan Derzhanski, Maria Cydzik

Problem #4 (20 points). Given are Old Indic word stems which are thought to preserve the most ancient (Indo-European) position of the stress. They are divided into root and suffix by a hyphen. The stressed vowel bears the mark ́.

v̥rk-a-	wolf	vádh-ri-	castrated	púr-va-	first
vadh-á-	deadly weapon	dhū-má-	smoke	bh̥rm-i-	mobile
sād-á-	sitting on horseback	d̥r-ti-	leather bag	k̥rs-í-	tillage
puṣ-tí-	prosperity	gh̥r-ṇi-	heat	stó-ma-	hymn
sik-tí-	effusion	gh̥r-ṇá-	heat	dar-má-	demolisher
pī-tí-	drinking, draught	ká-ma-	desire	nag-ná-	naked
gá-ti-	walk			vák-va-	rolling

(a) Explain why it is not possible to use these data to determine the placement of the stress of the following stems: *bhāg-a-* ‘share’, *pad-a-* ‘step’, *pat-i-* ‘lord’, *us-ri-* ‘morning light’.

(b) Indicate the stress of the word stems given below:

m̥rdh-ra-	foe	tan̥-ti-	cord	svap-na-	sleep	abh-ra-	cloud
phe-na-	foam	bhār-a-	burden	bhū-mi-	earth, soil	ghan-a-	killing
stu-ti-	praise	dū-ta-	messenger	ghar-ma-	heat	gh̥ṛs-vi-	exuberant

⚠ **h** indicates that the preceding consonant is aspirated (pronounced with a puff of air); **ṇ**, **᷑** and **t̥** ≈ *n*, *sh* and *t* in *barn*, *marsh* and *art*, uttered with the tip of the tongue turned back; **r̥** is a vowel similar to the middle sound in American English *bird*. The mark ́ denotes vowel length.

—Alexander Piperski

Problem #5 (20 points). The following are sentences in Nahuatl and their English translations:

1. <i>nimitztlazohtla</i>	I love you
2. <i>tikmaka in āmoxtli</i>	you give the book to him
3. <i>nitlahtoa</i>	I say something
4. <i>kātlītia in kuauhxīnki in pochtekatl</i>	the merchant makes the carpenter drink; the carpenter makes the merchant drink
5. <i>titzāhtzi</i>	you shout
6. <i>niki in ātōlli</i>	I drink the atole
7. <i>tikuīka</i>	you sing
8. <i>tinēchtatlakāhuilia</i>	you leave something for me
9. <i>kochi in tīzītl</i>	the healer sleeps
10. <i>niknekiltia in kuauhxīnki in āmoxtli</i>	I make the carpenter want the book
11. <i>mitztēhuitēkilia</i>	he beats you for somebody; he beats somebody for you
12. <i>kēhua in kikatl</i>	sings the song
13. <i>niktlalhuia in zihuātl</i>	I say something to the woman
14. <i>tiktēkāhualtia in oktli</i>	you make somebody leave the wine
15. <i>ātli</i>	he drinks
16. <i>tlachīhua in pochtekatl</i>	the merchant prepares something
17. <i>tēhuetzītia in zihuātl</i>	the woman makes somebody fall

(a) Translate into English in all possible ways:

18. *tiktlazohatlaltia in zihuātl in kuauhxīnki*
19. *nēchtzāhtzītia*
20. *tikhuiteki*
21. *nikēhuilia in kikatl in tīzītl*
22. *nikneki in ātōlli*
23. *mitztlakāhualtia*

(b) Translate into Nahuatl:

24. he makes me prepare the atole
25. you prepare the wine for somebody
26. the healer makes you sleep
27. I sing something
28. I fall

⚠ Classical Nahuatl was the language of the Aztec Empire in Mexico.

The Nahuatl sentences are given in a simplified orthography. *ch*, *hu*, *ku*, *tl*, *tz*, *uh* are consonants. The mark *ā* denotes vowel length.

Atole is a cornstarch-based hot drink.

—Bozhidar Bozhanov, Todor Tchervenkov

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Good luck!