

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-argued. 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 ktiëk hori orom a tgiang</i>
7 betel nuts	<i>o vuo a ktiëk 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 ktiëk</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 ktiëk hori orom a ktiëk hori orom a korlotge</i>
19 betel nuts	<i>o vuo a lo ktiëk hori orom a ktiëk 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 ktiëk
o vuo a lo ktiëk 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.

—Eugenia 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)

Yɔ́ɔ́ɔ́ɔ́ɔ́ɔ́ɔ́	bàlákàwúli	unexpectedness; sandgrouse (a kind of bird)
ɔ́ɔ́ɔ́ɔ́ɔ́	játùrú	hyena
Yɔ́Yɔ́ɔ́ɔ́	kòlìjì	washing water
ɔ́ɔ́	wàlá	slate
ɔ́ɔ́ɔ́ɔ́ɔ́	kúmayira	advertising
Yɔ́ɔ́ɔ́ɔ́ɔ́ɔ́	tùbabumóri	Christian priest
ɔ́ɔ́ɔ́ɔ́ɔ́	?	uncircumcised boy
ɔ́ɔ́ɔ́	?	match-seller
?	kòrikóri	rust
?	báwò	because

(b)

ɔ́ɔ́ɔ́ɔ́	márajàba	hail!
ɔ́ɔ́ɔ́ɔ́	jílasama	hippopotamus
Yɔ́ɔ́ɔ́ɔ́ɔ́	kòròkarasí	gerontocracy
ɔ́ɔ́	kàna	may it be that
ɔ́ɔ́ɔ́ɔ́ɔ́	bàsitéme	wide-meshed sieve
ɔ́ɔ́ɔ́ɔ́ɔ́	nàmátòrokó	hyena
ɔ́ɔ́ɔ́	?	rainbow
ɔ́ɔ́ɔ́	?	light (of a lamp)
ɔ́ɔ́ɔ́ɔ́	?	a kind of midges; honey from such midges
?	jàmanaké	the joys, pleasures of youth
?	létère	letter, missive
?	bìlakóro	uncircumcised boy

Fill in the gaps.

△ The N'Ko script was invented in 1949 by the Guinean enlightener Souleymane Kanté.

In the Roman script **j** = *j* in *judge*, **y** = *y* in *yay!*, **ɛ** ≈ *a* in *hat*, **ɔ** ≈ *a* in *hall*. The marks **ˊ** and **ˋ** 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
kaun mya?	06/01/2009	pañ we	06/04/2009
zeiya cə	06/09/2009	thouñ uñ	06/06/2009
pyesouñ auñ	06/18/2009	khiñ le nwɛ	06/08/2009
ne liñ	06/20/2009	wiñ i muñ	06/10/2009
lwiñ koko	06/24/2009	mimi khaiñ	06/18/2009
phouñ naiñ thuñ	06/25/2009	su mya? so	06/30/2009
myo khiñ wiñ	07/02/2009	susu wiñ	07/07/2009
tiñ mauñ la?	07/04/2009	yadana u	07/08/2009
khaiñ miñ thuñ	07/06/2009	tiñ za mə	07/11/2009
wiñ cə auñ	07/08/2009	yinyiñ myiñ	07/15/2009
the? auñ	07/11/2009	kepi thuñ	07/20/2009
shañ thuñ	07/21/2009	shu mañ cə	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 siñpu, so mo cə, ye auñ naiñ
- girls: daliya, e tiñ, phyuphyu wiñ

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), **ɲ** = *ng* in *hang*, **ɳ** indicates that the preceding vowel is nasal, **ɔ** ≈ *a* in *hall*, **p** ≈ English *th* in *with*, **y** = *y* in *yay!*, **ʔ** 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 ́.

<i>vṛ́k-a-</i>	wolf	<i>vádh-ri-</i>	castrated	<i>púr-va-</i>	first
<i>vadh-á-</i>	deadly weapon	<i>dhū-má-</i>	smoke	<i>bhr̥m-i-</i>	mobile
<i>sād-á-</i>	sitting on horseback	<i>dr̥-ti-</i>	leather bag	<i>kr̥ṣ-i-</i>	tillage
<i>puṣ-ti-</i>	prosperity	<i>ghṛ-ṇi-</i>	heat	<i>stó-ma-</i>	hymn
<i>sik-ti-</i>	effusion	<i>ghṛ-ṇá-</i>	heat	<i>dar-má-</i>	demolisher
<i>pī-ti-</i>	drinking, draught	<i>kā-ma-</i>	desire	<i>nag-ná-</i>	naked
<i>gá-ti-</i>	walk			<i>vák-va-</i>	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:

<i>mṛdh-ra-</i>	foe	<i>tan-ti-</i>	cord	<i>svap-na-</i>	sleep	<i>abh-ra-</i>	cloud
<i>phe-na-</i>	foam	<i>bhār-a-</i>	burden	<i>bhū-mi-</i>	earth, soil	<i>ghan-a-</i>	killing
<i>stu-ti-</i>	praise	<i>dū-ta-</i>	messenger	<i>ghar-ma-</i>	heat	<i>ghṛṣ-vi-</i>	exuberant

△ **h** indicates that the preceding consonant is aspirated (pronounced with a puff of air); **ṇ**, **ṣ** and **ṭ** ≈ *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>nimitztlazohltla</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>kātlitia 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>tikuika</i> | you sing |
| 8. <i>tinēchtlakāhuilia</i> | you leave something for me |
| 9. <i>kochi in tiztli</i> | the healer sleeps |
| 10. <i>niknekiltia in kuauhxīnki in āmoxtli</i> | I make the carpenter want the book |
| 11. <i>mitztēhuitekilia</i> | he beats you for somebody;
he beats somebody for you |
| 12. <i>kēhua in kikatl</i> | sings the song |
| 13. <i>niktlalhua 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>tlachihua in pochtekatl</i> | the merchant prepares something |
| 17. <i>tēhuetzitia in zihuātl</i> | the woman makes somebody fall |

(a) Translate into English in all possible ways:

18. *tiktlazohltaltia in zihuātl in kuauhxīnki*
19. *nēchtzāhtzitia*
20. *tikhuiteki*
21. *nikēhuilia in kikatl in tiztli*
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 *ː* denotes vowel length.

Atole is a cornstarch-based hot drink.

—Bozhidar Bozhanov, Todor Tchervenkov

Editors: Alexander Berdichevsky, Bozhidar Bozhanov, Ivan Derzhanski, Ludmilla Fedorova, Dmitry Gerasimov, Ksenia Gilyarova, Stanislav Gurevich, Adam Hesterberg, Renate Pajusalu, Alexander Piperski, Todor Tchervenkov (editor-in-chief).

English text: Bozhidar Bozhanov, Ivan Derzhanski, Adam Hesterberg, Alexander Piperski, Todor Tchervenkov.

Good luck!