

# Sixth International Olympiad in Theoretical, Mathematical and Applied Linguistics

Bulgaria, Sunny Beach, 4–9 August 2008

Problems for the Individual Contest

## 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 words of the Micmac language written in the so-called Listuguj orthography, their phonetic transcriptions and English translations:

1	<i>tmi'gn</i>	[dəmīgən]	axe
2	<i>an'stawteg</i>	[anəstawtek]	unsafe
3	<i>gjiansale'wit</i>	[əkciānsalēwit]	archangel
4	<i>mgumie'jo'tlatl</i>	[əmkumiējōdēladəl]	to shoe ( <i>a horse</i> )
5	<i>amqwanji'j</i>	[amx <sup>w</sup> ancīc]	spoon
6	<i>e'jnt</i>	[ējənt]	Indian agent
7	<i>tplutaqan</i>	[ətpədudayan]	law
8	<i>ge'gwisink</i>	[gēg <sup>w</sup> isink]	to lie on the top
9	<i>lnu'sgw</i>	[lənūs <sup>w</sup> k]	Indian woman
10	<i>g'p'ta'q</i>	[gəbədəx]	above, overhead
11	<i>epsaqtejg</i>	[epsaxteck]	stove

(a) Transcribe the following words:

12	<i>gsnqo'qon</i>	foolishness
13	<i>tg'poq</i>	spring water
14	<i>gmū'jmin</i>	raspberry
15	<i>emtoqwatg</i>	to worship
16	<i>te'plj</i>	goat

(b) Write in the Listuguj orthography:

17	[ətpədēsən]	south
18	[əmteskəm]	snake
19	[alaptək]	to look around
20	[gəlamen]	so, therefore

**NB:** Micmac is an Algonquian language. It is spoken by approx. 8000 people in Canada.

In the transcription [ə]  $\approx$  *o* in *abbot*, [c] = *ch* in *church*, [j] = *j* in *judge*, [x] = *ch* in Scottish *loch*, [ɣ] is the same sound but voiced; [w] shows that the preceding consonant is pronounced with rounded lips. The mark  $\bar{\phantom{x}}$  denotes vowel length.

—Bozhidar Bozhanov

**Problem #2 (20 points).** The following are four excerpts from Old Norse poems composed around 900 C.E. All of them are written using the meter named *dróttkvætt* (lit. ‘court meter’):

- |  |   |
|--|---|
| <p><b>I</b></p> <p>1 ók at ísarnleiki</p> <p>2 Jarðar sunr, en dunði ...</p> <p><b>II</b></p> <p>1 þekkiligr með þegnum</p> <p>2 þrymseilar hval deila.</p> <p>3 en af breiðu bjóði</p> <p>4 bragðvís at þat lagði</p> <p>5 ósvífrandi ása</p> <p>6 upp þjórhloti fjóra.</p> | <p><b>III</b></p> <p>1 áðr gnapsólar Gripnis</p> <p>2 gnýstærandi fœri</p> <p>3 rausnarsamr til rimmu</p> <p>4 ríðviggs lagar skíðum.</p> <p><b>IV</b></p> <p>1 háði gramr, þars gnúðu,</p> <p>2 geira hregg við seggi,</p> <p>3 (rauð fnýsti ben blóði)</p> <p>4 bryngogl í dyn Skoglar,</p> <p>5 þás á rausn fyr ræsi</p> <p>6 (réð egglituðr) seggir ...</p> |
|--|---|

One of the main principles of *dróttkvætt* is alliteration. The first line of each distich (pair of lines) contains two words beginning with the same sound, and the first word of the second line begins with this sound, too: e. g., **rausnarsamr**, **rimmu** and **ríðviggs** (III:3–4). All vowels are considered to alliterate with one another and with **j**: e. g., **ók**, **ísarnleiki** and **Jarðar** (I:1–2). But this is not the only rule.

The texts given above have been handed down in more than one manuscript. Sometimes different words are found in corresponding parts of the text, and the scholars have to decide which of the variants is original. Different considerations may motivate the conclusion. Sometimes the rules of versification help to recognize some of the variants as false. For example, in line I:2 we find not only **dunði**, but also **dulði** and **djarfi**. **dulði** can be rejected because of the structure of the verse, but both **dunði** and **djarfi** fit into the line, and one needs other reasons to choose between these words. In line III:1 **Gripnis** and **Grímnis** occur in the manuscripts, but **Grímnis** doesn’t fulfill the requirements of the verse.

- (a) Describe the rules which are observed in a distich of *dróttkvætt*.

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- (b) Given is a stanza in which 13 words are omitted:

- V**
- |   |          |                      |
|---|----------|----------------------|
| 1 | a        | (þreifsk reiddra øxa |
| 2 | b        | ; knóttu spjór c )   |
| 3 | d        | bitu seggi           |
| 4 | e        | þjóðkonungs ferðar,  |
| 5 | þás (    | f hǫlða)             |
| 6 | g        | h i                  |
| 7 | (hór vas | j of k )             |
| 8 | l        | (flugbeiddra m ).    |

The following list contains (in alphabetical order) all 13 omitted words and two words which do not belong in stanza V:

andskoti, Gauta, glymja, hlaut,  
hugfyldra, hœgra, ríks, rymr,  
sigr, smíði, svartskyggð, sverð,  
svírum, sǫngr, vigra

Fill in the gaps in stanza V.

**NB:** Old Norse is a North Germanic language which was in use approximately between 700 and 1100 C.E.

æ ≈ English *a* in *cat*, œ = French *eu* or German *ö* (these letters stand for long vowels). ø is read as a short œ; y = French *u* or German *ü*, ø is an open *o*. **au** and **ei** are pronounced as a single syllable. ð and þ = English *th* in *this* and *thin* respectively. **x** = **k**+**s**. The mark ´ denotes vowel length. All samples of poetry in the problem are given in a normalized orthography and conform to the rules of the genre.

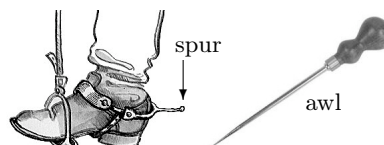
—Alexander Piperski

**Problem #3 (20 points).** The following are words and compounds in two languages of New Caledonia – Drehu and Cemuhî – and their English translations given out of order:

Drehu	English
<i>drai-hmitrötr, gaa-hmitrötr, i-drai, i-jun, i-wahnawa, jun, ngöne-gejē, ngöne-uma, nyine-thin, uma-hmitrötr</i>	sanctuary, bunch of bananas, calendar, bone, church, coast, awl, Sunday, skeleton, wall
Cemuhî	English
<i>a-pulut, ba-bwén, ba-jié, bé-ödu, bé-tii, bé-wöli, bé-wöli-wöta, tii, wöta</i>	bed, animal, fork, cup, pencil, coast, to write, twilight, spur

And here are several words translated from Drehu into Cemuhî:

Drehu	<i>gaa</i>	<i>ngöne-gejē</i>	<i>nyine</i>	<i>thin</i>
Cemuhî	<i>a</i>	<i>ba-jié</i>	<i>bé</i>	<i>wöli</i>



- (a) Determine the correct correspondences.
- (b) What do you think the words *wahnawa* and *drai* mean in Drehu, and *wöli* and *pulut* in Cemuhî?
- (c) In Drehu *tusi* is ‘book’ and *bii* is ‘bee’. Translate from Drehu: *i-bii, tusi-hmitrötr*.

**NB:** Drehu is spoken by over 10 000 people on Lifu Island to the east of New Caledonia. Cemuhî is spoken by approx. 2000 people on the east coast of New Caledonia. Both languages belong to the Austronesian family.

In Drehu *ē* ≈ *a* in *aspen*, *ö* = French *eu* or German *ö*, *hm* and *hn* are specific unvoiced consonants; *dr* and *tr* ≈ *d* and *t* in *word* and *art*, uttered with the tip of the tongue turned back; *j* and *th* = English *th* in *this* and *thin* respectively; *ng* = *ng* in *hang*; *ny* ≈ *ni* in *onion*.

A sanctuary is the principal, most sacred part of a church.

—Ksenia Gilyarova

**Problem #4 (20 points).** The following are words in Copainalá Zoque and their English translations:

<b>mis nakpatpit</b>	with your cactus	<b>kamajdaʔm</b>	shadows
<b>nakpat</b>	a cactus	<b>ʔas ncapkasmāšeh</b>	as if above my sky
<b>mokpittih</b>	only with the corn	<b>capšeh</b>	like a sky
<b>pokskukyasmataʔm</b>	above the chairs	<b>pahsungotoya</b>	for the squash
<b>pokskuy</b>	a chair	<b>pahsunšehtaʔmdih</b>	just like squashes
<b>peroltih</b>	only a kettle	<b>tackotoyatih</b>	only for the tooth
<b>kocaktaʔm</b>	mountains	<b>kumgukyasma</b>	above the town
<b>komgasmatih</b>	right above the post	<b>kumgukyotoyataʔm</b>	for the towns
<b>ʔas ngom</b>	my post	<b>cakyotoya</b>	for the vine
<b>kamajbitšeh</b>	as if with the shadow	<b>mis ncay</b>	your vine

(a) Translate into English:

**cakyasmatih**  
**kamajšeh**  
**ʔas mok**  
**mis ndactaʔm**  
**pahsunbit**  
**perolkotoyašehtaʔm**

(b) Translate into Copainalá Zoque:

for the chair  
with my kettle  
just like a mountain  
posts  
above the shadows  
your town

**NB:** The Copainalá Zoque language is of the Mixe-Zoque linguistic family. It is spoken by approx. 10 000 people in the province Chiapas in southern Mexico.

*ʌ* ≈ *u* in *but*; *c* ≈ *ts* in *hats* (pronounced as a single consonant), *nc* ≈ *nds* in *hands*, *š* = *sh*, *ŋ* = *ng* in *hang*, *y* = *y* in *yay!*; **ʔ** is a specific consonant (the so-called glottal stop).

—Ivan Derzhanski

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

- |  |                               |
|--|-------------------------------|
| 1. <i>Qingmivit takujaatit.</i>                    | Your dog saw you.             |
| 2. <i>Inuuhuktuup iluaqhaiji qukiqtanga.</i>       | The boy shot the doctor.      |
| 3. <i>Aanniqtutit.</i>                             | You hurt yourself.            |
| 4. <i>Iluaqhaijiup aarqijaatit.</i>                | The doctor cured you.         |
| 5. <i>Qingmiq iputujait.</i>                       | You speared the dog.          |
| 6. <i>Angatkuq iluaqhaijimik aarqisijuq.</i>       | The shaman cured a doctor.    |
| 7. <i>Nanuq qaijuq.</i>                            | The polar bear came.          |
| 8. <i>Iluaqhaijivit inuuhuktuit aarqijanga.</i>    | Your doctor cured your boy.   |
| 9. <i>Angunahuktiup amaruq iputujanga.</i>         | The hunter speared the wolf.  |
| 10. <i>Qingmiup ilinniaqtitsijiit aanniqtanga.</i> | The dog hurt your teacher.    |
| 11. <i>Ukiakhaqtutit.</i>                          | You fell.                     |
| 12. <i>Angunahukti nanurmik qukiqsijuq.</i>        | The hunter shot a polar bear. |

(a) Translate into English:

13. *Amaruup angatkuik takujanga.*
14. *Nanuit inuuhukturmik aanniqsijuq.*
15. *Angunahuktiit aarqijuq.*
16. *Ilinniaqtitsiji qukiqtait.*
17. *Qaijutit.*
18. *Angunahuktimik aarqisijutit.*

(b) Translate into Inuktitut:

19. The shaman hurt you.
20. The teacher saw the boy.
21. Your wolf fell.
22. You shot a dog.
23. Your dog hurt a teacher.

**NB:** Inuktitut (Canadian Inuit) belongs to the Eskimo-Aleut family of languages. It is spoken by approx. 35 000 people in the northern part of Canada.

The letter *r* denotes a ‘Parisian’ *r* (pronounced far back in the mouth), and *q* stands for a *k*-like sound made in the same place.

A shaman is a priest, sorcerer and healer in some cultures.

—Bozhidar Bozhanov

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Good luck!