



PROBLEM 1: *Nen* (14 points)

Nen is a highly endangered language spoken by only about 250 people in the village of Bimadeben in the Morehead District of the Western Province in Papua New Guinea.

NOTE: *a* and *á* are different sounds: *a* is a long *ah* sound as in *ta* for ‘thankyou’, *á* is a short version of it, like the *a* in *pizza*. *e* and *è* also represent distinct sounds: *è* is pronounced more like the *a* sound in *bat* while *e* is like *e* in *egg*. How these sounds are pronounced, however, is not relevant to the questions asked about *Nen*.

Study the examples from *Nen* and their English translations, then answer the following questions:

1	I work	<i>yánd nogiabtan</i>
2	you (one person) work	<i>bám nogiabte</i>
3	he or she works	<i>bè nogiabte</i>
4	I talk	<i>yánd nowabtan</i>
5	I return	<i>yánd nánangwtan</i>
6	you (one person) return	<i>bám nánangwte</i>
7	he or she talks	<i>bè nowabte</i>
8	we (three or more) work	<i>yánd nogiabtam</i>
9	we (three or more) return	<i>yánd nánangwtam</i>
10	you (three or more) work	<i>bám nogiabtat</i>
11	you (three or more) return	<i>bám nánangwtat</i>
12	they (three or more) talk	<i>bè nowabtat</i>
13	they (three or more) work	<i>bè nogiabtat</i>
14	we two work	<i>yánd nogiabám</i>
15	you two return	<i>bám nánangwát</i>
16	they two talk	<i>bè nowabát</i>
17	they two return	<i>bè nánangwát</i>
18	we two talk	<i>yánd nowabám</i>



Question 1. How would you say the following: (0.5 for pronoun & 0.5 for verb) /5

1a. you (one person) talk	bám nowabte
1b. he (or she) returns	bè nánangwte
1c. they (three or more) return	bè nánangwtat
1d. we (three or more) talk	yánd nowabtam
1e. you two work	bám nogiabát

Question 2. What words and/or parts of words do you need in order to express these English words? (give 0.5 for each correct piece of information in each answer) /3

2a 'I' = *yánd*, plus the suffix/ending *t* on the root, plus the suffix *-an*. (1.5)

[NE: alternative answers that would be OK:

(a) *yánd* plus *tan*. However an answer identifying three sites is more insightful – see 4 below (1)

(b) at this stage some students might use the term 'infix' for *-t-* and though it is technically wrong they shouldn't be penalised for this since they haven't studied linguistics yet]

2b 'they (more than two)' = *bè*, plus the suffix *t* on the root, plus the suffix *-at*. (1.5)

[NE: alternative answers that would be OK:

(a) *bè* plus *tat*. However an answer identifying three sites is more insightful – see 4 below (1)

(b) at this stage some students might use the term 'infix' for *-t-* and though it is technically wrong they shouldn't be penalised for this since they haven't studied linguistics yet]

Question 3. How would you translate: /4

3a *yánd* = 'Any set containing speaker // first person' [equally good answers] 'I or we' [still OK, but not quite as good since it's disjunctive]

[NE: Of course they may add something like 'regardless of number', which is insightful though not necessary if the characterisation is right]

[ML: I think that the use of the term *translate* in Question 3 lends towards the 'I' and/ or 'we' answer, so it should get full 2 marks. The question does not ask for a definition of meaning.]

3b *bè* = 'Any set not containing speaker or hearer // third person' [equally good answers] 'he, she or they' [NE: still OK, but not quite as good since it's disjunctive] [ML: the same applies here: 'he', 'she' or 'they' should get full 2 marks]

[NE: Of course they may add something like 'regardless of number', which is insightful though not necessary if the characterisation is right]



Question 4. How would you best define the meaning of the *t* found in *nogiabtan* in 1 and the corresponding *t* in 2-13? /2

One, or three or more – i.e. any number but two/ any number less or greater than 2. 'Non-dual' would be the most elegant term. [ML any of these answers for full 2 points]

Question 5. How do you express the idea that two people are carrying out the action? /1

By omitting the *-t-* [after the stem/before the subject suffix etc.] // by using the bare stem [equally good answers]

Question 6. You hear a new phrase *yánd neretan* 'I listen'. Hearing that, how do you think you would say 'they (three or more) listen'? = *bè neretat* /1

TOTAL = /14



PROBLEM 2: Enga verbal pronouns (14 points)

Enga is a language spoken by over 150,000 people in the Enga area in the highlands of Papua New Guinea.

Enga verbs always incorporate a sound or sequence of sounds indicating whether it is the speaker or addressee, or another person (or some combination of these) who is being referred to by the *subject* word or phrase in the sentence (typically referring to the person doing the action, or who is in the state denoted by the verb). A small number of 'give' verbs also incorporate information about who something is being given to.

Consider these sentences which are about the gift of a pig. These sentences contain information about both the 'pig-giver' and the 'pig-receiver'. Pigs play a very important role in the economic and social life of Enga people.

- | | | | | | |
|----|----------------------|-----------------|---------------------|----------------------|----------------------------------|
| 1. | Namba-mé
I-agent | émba
you | mená méndé
pig a | dílio.
give | <i>I am giving you a pig.</i> |
| 2. | Émba-me
you-agent | nambá
me | mená méndé
pig a | dilíno.
give | <i>You are giving me a pig.</i> |
| 3. | Baa-mé
he-agent | nambá
me/you | mená méndé
pig a | diliámo.
give | <i>He is giving me a pig.</i> |
| 4. | Baa-mé
he-agent | émba
you | mená méndé
pig a | diliámo.
give | <i>He is giving you a pig.</i> |
| 5. | Namba-mé
I-agent | baá
him | mená méndé
pig a | maílio.
give | <i>I am giving him a pig.</i> |
| 6. | Émba-me
you-agent | baá
him | mená méndé
pig a | mailíno.
give | <i>You are giving him a pig.</i> |
| 7. | Baa-mé
he-agent | baá
him | mená méndé
pig a | mailiámo.
give | <i>He is giving him a pig.</i> |
| 8. | Baa-mé
he-agent | baá
him | mená méndé
pig a | maipiámo.
gave | <i>He gave him a pig.</i> |
| 9. | Baa-mé
he-agent | baá
him | mená méndé
pig a | maitámo
will_give | <i>He will give him a pig.</i> |

**PART 1. (8 points)**

Focusing on the forms of the verb (= last word in each sentence):

Question 1. Which part of the verb indicates the *giver*? Write the Enga forms which correspond to the English word in the indicated sentences. (0.5 each) /1.5

Sentence	English	Enga
1. & 5.	I	-o
2. & 6.	you	-no
3,4, 7, 8, 9	he	-ámo

Question 2. Which part of the verb indicates the *receiver*? Write the Enga forms which correspond to the English word in the indicated sentences. (0.5 each) /1.5

Sentence	English	Enga
1. & 4.	you	d-
2. & 3.	me	d-
5-9	him	ma-

Question 3. (a) Circle the part of the following three verbs that expresses the **time** of the 'giving' event relative to the time at which the sentence is uttered, and (b) indicate whether it marks *present*, *past* or *future* by writing this under the matching verb. (The number indicates the sentence the verb is taken from.) (1.5 for correct morpheme (underlined here) + 1.5 for correct meaning) /3

7. *mailíámo* 8. *maipiámo* 9. *maitámo*
present *past* *future*

Question 4. Circle the part of the verb that expresses the idea of *giving* in the following verbs taken from the sentences indicated by the number: /2

1. *dilio* 2. *dilino* 5. *mailíno* 9. *maitámo*

[First 'i' should be circled]

**PART 2. (6 points)**

Although *li* is written in the verbs in 1-7 whether followed by a consonant or a vowel, when it is followed by a vowel (a, e, i, o, u) the 'i' is not pronounced as a full 'i' sound as in English *lit* (or *lee*), so that *dilio* in sentence 1 is not pronounced as *di-li-o* (or *dee-lee-o*) but as *di-lyo* (*ly* is like in English *million* which is pronounced as two syllables *mil-yon* and not as three syllables: *mi-li-on* or *mi-lee-on*).

Each Enga verb has one accented syllable marked by an acute accent symbol (´) over the accented vowel.

Question 5. Is it possible to predict which syllable of each verb will receive the accent?

Explain the reasons for your answer, showing how your explanation can account for the accent placement on the verb in sentences 1, 2, 3 and 5. /4

Yes. The accent is always on the second last (penultimate) syllable. (1 mark)

i. given that **dilio** is pronounced as *dilyo* with two syllables, the accent is on the second last syllable which is the first syllable (i.e. on the first -i-. ii. In **dilino** and **diliámo** the accent is on the second last syllable. iii. Given that **mailio** is pronounced as a three syllable word *ma-i-lyo*, the accent falls on first -i- as it is the vowel in the second last syllable. (1 mark for each of these 3 explanations which may be worded differently. Half marks if partly right.)

Question 6. Comparing the placement of the accent on the first word of each sentence and the accent on the pronoun which is the second word, can you account for the variable placement of the accent on the first word: either on the first syllable or the final syllable? /2

When the agent ending *-me* is added to the pronoun, if the pronoun without this ending is accented on the first vowel (as seen when it is the second word of the sentence) then the accent stays on that vowel, otherwise it moves to the final syllable of the augmented word (OR to the ending/suffix =*me*), e.g., *émba + me* > *émba-me*, *baá + me* > *baa-mé*, *nambá + me* > *namba-mé*. [There are other ways of expressing this of course, e.g. if the pronoun is accented on first syllable (or vowel) there is no change, if accented on second/final syllable (or vowel) then it moves to final syllable of augmented word/onto *-me*.]

TOTAL= /14



PROBLEM 3. *Deciphering Linear B* (30 points)

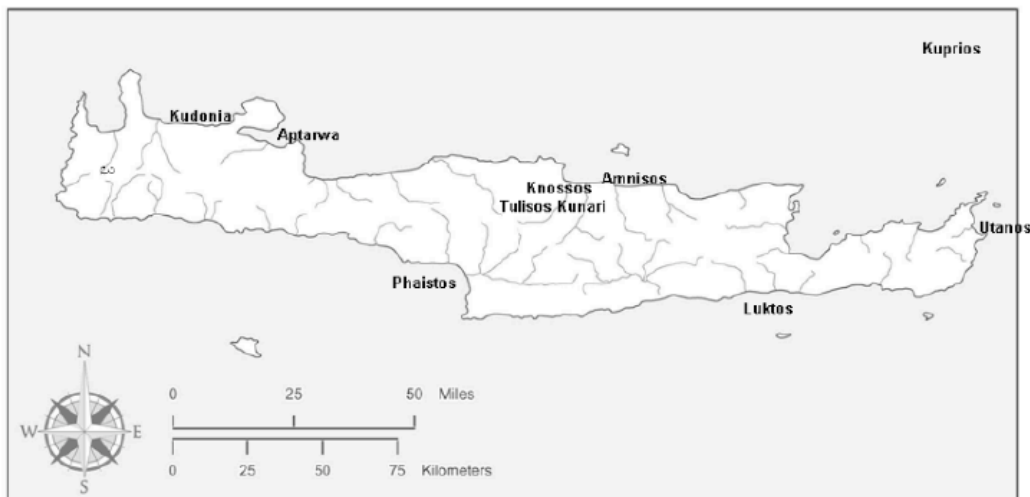
Linear B, deciphered by the architect and amateur epigrapher Michael Ventris in 1953, was used to write Mycenaean Greek around the 15th century BCE. Linear B tablets, all of which were accounting records, have been found both on Crete and at various Mycenaean sites on the Greek mainland.

Linear B isn't perfectly suited for Greek; it is an adaptation of another script (Linear A) that was used to write a language about which very little is known. Linear A/B didn't distinguish *l* and *r*, nor did it distinguish the three sounds written in the Roman alphabet as *ba*, *pa* and *p^ha* (which were distinct sounds in Greek), and apparently it could only write sequences of V or CV syllables so that a syllable in a Greek word like *k^hrusos* 'gold' had to be broken up as something like *ku-ru-so*. (Here V stands for vowel and C stands for consonant.) The famed city of *Knossos* was written as though it was pronounced as *ko-no-so*. Some consonant sounds at the end of syllables were not written, e.g., final *s* in *k^hrusos* and *Knossos*, but others such as *p* and *k* were. The writing is to be read from left to right.

In what follows you will be asked to decipher a portion of the Linear B symbol set.

The map shows the approximate locations of some ancient Cretan towns (a list of these will be found on the next page). The spellings reflect their probable pronunciation in Mycenaean Greek (not their pronunciation in Modern Greek). Note that we do not know the location of *Kuprios*; also, *Tulisos* and *Kunari* are two different places. Most of these names have stayed more or less the same up until the present day. However, one of the names on the map is **not** the name that was used in Mycenaean times.

Map of ancient Crete



Map by Tom Elliott. Copyright 2003, Ancient World Mapping Center

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Below are the spellings of these place names in Linear B. Beside them are the place names in Roman script shown on the map, but the names written in Roman script are **not** in the same order as those written in Linear B. Remember that one of the Linear B words does not correspond to a word written in Roman script.

Question 1. Link each place name written in Linear B with its equivalent written in Roman Script by drawing a line between each pair of words. (One is done for you as an illustration.)

(0.5 per symbol)

/14

	<ul style="list-style-type: none"> Kuprios Kudonia Aptarwa Knossos Amnisos Tulisos Kunari Phaistos Luktos Utanos
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The diagram shows a grid of 18 Linear B symbols on the left and a list of 10 Roman place names on the right. Lines connect the symbols to the names: 1. The top-left symbol (𐀓) is connected to Kuprios. 2. The second symbol in the first row (𐀞) is connected to Kudonia. 3. The third symbol in the first row (𐀛) is connected to Aptarwa. 4. The first symbol in the second row (𐀔) is connected to Knossos. 5. The second symbol in the second row (𐀖) is connected to Amnisos. 6. The third symbol in the second row (𐀙) is connected to Tulisos. 7. The fourth symbol in the second row (𐀛) is connected to Kunari. 8. The first symbol in the third row (𐀑) is connected to Phaistos. 9. The second symbol in the third row (𐀗) is connected to Luktos. 10. The third symbol in the third row (𐀔) is connected to Utanos. 11. The first symbol in the fourth row (𐀓) is connected to Kuprios. 12. The second symbol in the fourth row (𐀛) is connected to Kudonia. 13. The third symbol in the fourth row (𐀛) is connected to Aptarwa. 14. The fourth symbol in the fourth row (𐀛) is connected to Knossos. 15. The first symbol in the fifth row (𐀛) is connected to Amnisos. 16. The second symbol in the fifth row (𐀛) is connected to Tulisos. 17. The third symbol in the fifth row (𐀙) is connected to Kunari. 18. The fourth symbol in the fifth row (𐀔) is connected to Phaistos. 19. The first symbol in the sixth row (𐀔) is connected to Luktos. 20. The second symbol in the sixth row (𐀑) is connected to Utanos. 21. The third symbol in the sixth row (𐀛) is connected to Kuprios. 22. The fourth symbol in the sixth row (𐀛) is connected to Kudonia. 23. The first symbol in the seventh row (𐀑) is connected to Aptarwa. 24. The second symbol in the seventh row (𐀛) is connected to Knossos. 25. The third symbol in the seventh row (𐀛) is connected to Amnisos. 26. The fourth symbol in the seventh row (𐀛) is connected to Tulisos. 27. The first symbol in the eighth row (𐀓) is connected to Kunari. 28. The second symbol in the eighth row (𐀙) is connected to Phaistos. 29. The third symbol in the eighth row (𐀛) is connected to Luktos. 30. The fourth symbol in the eighth row (𐀛) is connected to Utanos.

Question 2. Which placename written in Roman letters on the map does not correspond to a name in the Linear B list?

Kunari

/1.5

Question 3. Identify the word in the Linear B list which is not given in the list written in Roman letters. What was its approximate Mycenaean pronunciation, given what you now know about Linear B spelling?

Since one of the symbols used there only occurs in that name in this list, we will give you a hint: that symbol represents *ja* (pronounced *ya*). Note that if you solve all the others, you will be able to read this name.

Tuniya ~ Tunija

/1

[0.5 for getting tu and ni correct; as it asks about pronunciation I'd also allow answers like Tooniy/ja OR Tooneeya]



Question 4. For each Linear B symbol, what is a likely pronunciation? Recall that it will represent a syllable: either a vowel (V) or a consonant+vowel (CV) combination.

Answer this question by writing the Linear B symbol in the correct cell in the Table on the next page.

NOTE: Some of the syllables represented by Linear B have been omitted from the Table because they are not used in the placenames in our list. Even so, not all syllables represented in this Table are found in this list of placenames so that some cells should remain empty.

The symbols representing the syllables *jo* and *ja* (pronounced *yo* and *ya*) and the symbols representing the vowel *i* and the syllable *ki* have been placed in the Table as a guide.

0.5 for every correct symbol (up to 16) [There are 17 symbols in all]



	a	i	o	u
	𐤀	𐤁		𐤂
d			𐤃	
j	𐤄		𐤅	
k		𐤆	𐤇	𐤈
m		𐤉		
n		𐤊	𐤋	
p	𐤌	𐤍		
r		𐤎		𐤏
s			𐤐	
t	𐤑		𐤒	𐤓
w	𐤔			

/8

Question 5. What are the probable pronunciations of the following words whose meanings are indicated by the English words. (0.5 per syll - allow with or without final 's')

/5.5

𐤇 𐤍	‘girl’
𐤌 𐤑	‘all’
𐤒 𐤐	‘this’
𐤈 𐤉 𐤋	‘cumin’
𐤎 𐤋	‘linen’

kowa

pata

toso(s)

kumino(s)

lino(s) ~ rino(s)

TOTAL= /30



PROBLEM 4: HELP MY CAMERA! (7 points)

In the following dialogues the computer is misunderstanding the human because it is misinterpreting certain words or phrases:

Example 1

Human: There's this restaurant on Bancroft that's supposed to be really good that I heard about from my mother. Can you help me find it?

Computer: Where did you last see your mother?

Example 2

Human: My friend is looking for information about on-line movie databases. What should I tell him?

Computer: You can tell movie databases reviews of movies you've seen.

Example 3

Human: My parents are having a hard time choosing a new digital camera. How can I help them?

Computer: I'm afraid I don't understand your question. People don't help cameras.

A. What are the words (or phrases) that the computer is misinterpreting?

Ex. 1 it Ex. 2 him Ex.3 them /3

B. What rule is the computer using to interpret those words (or phrases)?

Link these words (OR pronouns) to the last phrase in the preceding sentence. /2

[Alternate wordings of course, e.g. assume that pronoun refers to same person/thing as the last (noun) phrase in the preceding sentence.]

C. Give a better rule that would make the computer interpret the words (or phrases) correctly in these examples.

Link the pronoun (~ assume the pronoun has the same referent as) with a phrase in the preceding sentence which has the same features/meaning as the pronoun, i.e., if pronoun is singular (refers to only one person/thing) link to a singular phrase (or phrase which refers to one person/thing), if pronoun is plural (refers to more than one) link to a phrase which refers to more than one, if pronoun refers to non-human link to a phrase referring to a non-human, otherwise link to phrase referring to human. (2 points for answer showing an understanding of how computer should proceed.) /2

TOTAL = /7



PROBLEM 5: *Bamanan-kan* (29 points)

The Bambara language (called Bamanan-kan by its speakers) is spoken in the Republic of Mali in West Africa. Bamako is its capital city. It is one of the Mande languages, closely related to languages spoken in parts of Sierra Leone, Burkina Faso, Côte d'Ivoire, Gambia, Guinea, Mauritania, and Senegal. Bambara is spoken by about 3 million people as a first language, and by many more as a second language. As many Bambara speakers have traditionally engaged in trade throughout West Africa their language has become a convenient language of wider communication (or *lingua franca*) for speakers of other more geographically restricted languages. The variant of this language spoken in Côte d'Ivoire is called Dyula, which means 'trader' or 'merchant'.

Note: Bambara is a tonal language. The grave accent (`) on a vowel (e.g., à) indicates a low tone, so that *ka* and *kà* would be distinct words, each with its own meaning. The tonal system of Bambara is more complex than what is written here since the missing tonal information is not relevant to the problems you need to solve.

Study the conversation on the next page between two men, Bala and Musa, paying attention to the word order in each sentence, and also to the way in which the time of the event relative to the time of the utterance is expressed. You should also focus on the difference between positive (or affirmative) sentences and negative ones and also the different ways in which statements and questions are formulated.



M:	I ni ce. I ka kènè wa?	Greetings. Are you well?
B:	N'ba. Tòorò tè.	OK. No problems.
	I bòra min?	Where have you come from?
M:	N' bòra so.	I've come from home.
	Madu bè yan wa?	Is Madu here?
B:	Ayi, a tè yan. A bòra yan.	No, he's not here. He's gone away from here.
M:	A taara min?	Where has he gone?
B:	A taara dugu kònò.	He's gone to town.
M:	A bè segin kà na dumuni kè wa?	Is he coming back to eat?
B:	Ayi, a tè segin.	He's not coming back.
	A ye dumuni kè kaban.	He has eaten already.
M:	Mobili bè Madu fè wa?	Has Madu got a car?
B:	Ayi, mobili t'a fè.	No, he doesn't have a car.
	Madu tè se kà mobili san.	Madu can't buy a car.
	Wari tè Madu fè dè!	Madu doesn't have any money!
	I taara sugu kònò kunun wa?	Did you go to market yesterday?
M:	Owò. N'taara yen ni n'muso ye.	Yes, I went there with my wife.
B:	Madu taara sugu kònò kunun.	Madu went to market yesterday.
	I y'a ye sugula wa?	Did you see him at the market?
M:	Ayi, n'man Madu ye sugula kunun.	No, I didn't see Madu at the market yesterday.
	N'ye Madu muso dònò ye yen.	I saw only Madu's wife there.
B:	I kòròke taara sugu kònò kunun wa?	Did your brother go to market yesterday?
M:	Ayi, a man taa sugu kònò. A bè Bamako.	No he didn't go to market. He's in Bamako.
B:	A bè mun kè yen?	What's he doing there?
M:	A bè baara kè yen.	He's working there.
B:	I ye mun san sugula kunun?	What did you buy at the market yesterday?
M:	N'ye dólò san yen.	I bought beer there.
B:	A ka di wa?	Is it good?
M:	Ayi, a man di. A ka kumun.	No, it's not good. It's sour.
	I ye tamati san sugula wa?	Did you buy vegetables at the market?
B:	Ayi, n'man tamati san, n'ye jègè dònò san yen.	No, I didn't buy vegetables, I bought only fish there.
M:	Jègè ka di wa?	Is the fish good?
B:	Owò. A ka di kosobe.	Yes. It's really good.
M:	N'bè bò yan sisan.	I'm leaving here now.
B:	I bè taa min sisan?	Where are you going now?
M:	N'bè taa so.	I'm going home.
	N'bè segin yen kà na dumuni kè.	I'm going back there to eat.
B:	Kà tile hère caya!	May the day pass in peace.
M:	Amiina.	Amen (so be it).



A. Write the Bambara translation of these English words:

	English	Bambara
1.	market	<i>sugu</i>
2.	home	<i>so</i>
3.	fish	<i>dyègè</i>
4.	beer	<i>dòlò</i>
5.	money	<i>wari</i>

(0.5 each)

/2.5

B. Write the English translation of these Bambara words:

	Bambara	English
1.	san	<i>buy</i>
2.	taa	<i>go</i>
3.	segin	<i>return/go~come back</i>
4.	di	<i>good</i>
5.	kumun	<i>sour</i>

(0.5 each)

/2.5

C. On the basis of what the speakers say in the preceding conversation, answer these questions in Bambara using a full sentence. Write your answer under each question. The first one is done as an example. /10

1.	Where did Musa come from when he met up with Bala? <i>A bòra so.</i>	
2.	Did Musa see Madu when he arrived at Bala's place or at the market? <i>A/Musa man Madu/a ye (yen). (=he/Musa didn't see Madu/him there)</i>	2
3.	Why can't Madu buy a car? <i>Wari t'a fè. / Wari tè Madu fè. (=He/Madu has no money)</i>	2
4.	When did Musa go to market? <i>Musa/a taara (sugu kònò/yen) kunun. (=Musa /he went to market/there yesterday)</i>	2
5.	Did Musa go to market by himself? <i>Ayi, a/Musa taara (sugu kònò/yen) ni a muso ye. (=No, he/Musa went to market/there with his wife.)</i>	2
6.	What did Musa buy at the market? <i>Musa/a ye dòlò san (yen/ sugula). (=Musa/he bought beer (there/ at the market))</i>	2

0.5 point for correct verb, 0.5 for correct AUX [*man, t', tè*], 0.5 for correct pronoun or noun (+prep/postposition) or adverb, 0.5 for correct word order. Bambara words in parentheses not required.

**D.** Translate these sentences into Bambara. (5 x 2.5)0.5 for correct N & Q word (*mobili, sugu(la), wari, kòròke & mun, min*)0.5 for correct V (*san, ye, fè*)0.5 for correct AUX (*ye/bè*)

0.5 for correct word order,

0.5 for final *wa* on yes-no Question and no final *wa* on *where/what-Q*Only count *sugula* once.

/12

1.	Did Madu buy a car?	Madu ye mobili san wa?
2.	What did Bala buy at the market?	Bala ye mun san sugula?
3.	Did Musa see Madu at the market?	Musa ye Madu ye sugula wa?
4.	Does Madu have any money?	Wari bè Madu fè wa?
5.	Where is Musa's brother?	Musa kòròke bè min?

E. English contrasts the verbs *go* and *come*. Bambara makes a contrast between the verb *taa* and the verb *bò*. On the basis of how *taa* and *bò* are used by Bala and Musa, is the meaning difference between these verbs exactly the same as for *go* and *come*? Explain your reasoning.

go and *come* contrast the direction of movement with respect to the speaker - moving away from the speaker or towards the speaker. *taa* and *bò* contrast in that *taa* focuses on the endpoint of the movement (move towards some place) whereas *bò* expresses movement away from some place (*move away from/out of/leave/ exit*).

/2

[Award marks if some part of the answer is given: e.g. how English 'go' and 'come' differ in meaning. Or how English 'go' and Bambara 'taa' differ, or English 'come' and Bambara 'bò', or Bambara 'taa' and 'bò'. Each of these would get at least 0.5]

TOTAL = /29



PROBLEM 6. *LETTERS FOR CUZCO* (6 points)

Orthography design is the process of developing an alphabet and spelling rules for a language. A good orthography has several features:

Given a spoken word, there's no question of how to spell it.

Given a written word, there's no question of how to pronounce it.

In the modern world, it's increasingly important that it be reasonably easy to type!

Quechua is spoken today by millions of people in Peru, Ecuador, and Bolivia, the descendents of the citizens of the Incan Empire. Quechua speakers are rapidly joining the Information Age, and both Google and Microsoft Windows now come in Quechua!

Like in English, there are more sounds in Quechua than there are letters on a keyboard, but there are ways around that. For example, we can assign one letter to multiple sounds so long as a reader can always predict, from its position in the word or from other letters in the word, which sound is meant. So if the sound [b] only ever occurs right after [m], and [p] never occurs right after [m], we can just write "p" for both, since you'll be able to predict from the previous letter whether "p" means [b] or [p].

This "phonemic principle" is the central principle of most orthographies, not just because it reduces letters but also because our minds categorize sounds in the same way.

On the next page you will see 33 words in Cuzco Quechua written as they are pronounced but not necessarily as they are written in the standard spelling system. *q* and *χ* represent consonant sounds that do not occur in English. See if you can do the tasks that follow.



awtu	car	qasi	free	sikasika	caterpillar
kanka	roasted	qatuy	to barter	sipiy	to kill
karu	far	qatoχ	merchant	sipeχ	murderer
kiru	teeth	qatisaχ	I will follow	soχtaral	sixty cents
kisa	nettle	qelqax	writer	sunka	beard
kisu	cheese	qolqe	silver	toχra	ball of ash
kunka	neck	qosa	husband	uyariy	to listen
kusa	great	qosqo	Cuzco	uywayχ	caretaker
layqa	witch	saqey	to abandon	waleχ	a lot
oqe	spotted	saχsa	striped	weqaw	waist
qasa	frost	seqay	to climb	yawar	blood

A. Show that we don't need separate letters for *q* and *χ*. /2

No two words differ only because of the difference between *q* and *χ* because *q* is found at the beginning of a syllable (or before a vowel) while *χ* is found at the end of a syllable (or before another consonant or the end of a word).

B. Show that we can't represent the vowels *a* and *i* by the same letter. /2

We wouldn't be able to write the contrast between *karu* and *kiru* or between *qasa* and *qasi*.

C. Show why we can't represent the vowels *a* and *e* by the same letter. /2

We would be unable to write the pronunciation contrast between *saqey* and *seqay*

[Any reasonable explanation for A, B & C gets full marks]

TOTAL = /6

Questions	1	2	3	4	5	6	TOTAL
MAX	14	14	30	7	29	6	100
Gained							