

<1> Malteaser<sup>1</sup> (1/2) 15 points

Maltese is the name of the language spoken on the Mediterranean islands of Malta, Gozo and Comino. It is the national language of Malta, where it is spoken by about 560,000 people. Along with English it is an official language in Malta, and is also one of the European Union's official languages. Maltese is a Semitic language quite closely related to Arabic.

Study the following Maltese nouns, which are given together with the definite article (equivalent to English 'the'). The English translations are given for your information, but are not relevant to the problem.

il bar	(the bar)	id dar	(the house)	li bdiewa	(the peasants)
il ktieb (*)	(the book)	iz żir	(the jug)	li mħadda	(the pillow)
il ġobon (*)	(the cheese)	ir raġel	(the man)	il qassis	(the priest)
li ksieħ	(the cold)	iċ ċpar	(the mist)	is silġ	(the snow)
l jum	(the day)	l għonq	(the neck)	il vjola	(the violet)
il ħmar	(the donkey)	l ufficċju	(the office)	il mara	(the woman)
l art	(the earth)	iġ ġebła	(the stone)	in nar	(the fire)
il lvant	(the east)	il langas	(the pear)		
l hemm	(the grief)				
is sħana	(the heat)				

**Pronunciation guide:**<sup>2</sup>

ċ = 'ch' as in 'church' (IPA [tʃ])

ġ is like English 'j' in 'judge' (IPA [dʒ])

h is like in English except at the beginning of a word, when it is silent

ħ is a sound made at the back of the throat, like the 'ch' in German, but much further back, technically, a voiceless pharyngeal fricative (IPA [ħ]). But the sequence 'għ' is silent

j is like 'y' in 'yes' (IPA [j])

q is a glottal stop, the sound in the middle of 'uh-oh' (IPA [ʔ])

x = 'sh' as in 'shoe' (IPA [ʃ])

z = 'ts' as in 'bits'

ż = z as in 'zoo'

All other letters have their expected values

<sup>1</sup> Created by Harold Somers (AILO).

<sup>2</sup> IPA = International Phonetic Alphabet.

## &lt;1&gt; Malteaser (2/2)

**Task 1.** The two words marked (\*) don't seem to fit the rules (or patterns) that determine the form of the definite article. Write the form of the definite article that you would expect before each of these words. **1 point (0.5 x 2)**

**li** ktieb 'the book'

**ig** gobon 'the cheese'

**Task 2.**

a) List the consonant sounds that trigger the assimilation of the consonant in the definite article so that it is the same as the first consonant sound in the following word: **2 points**

d, l, n, r, t, ċ, ġ, s, x, z, ż

2pts if all correct. Remove 0.5 if 1-2 incorrectly listed. No mark if list includes sound(s) that don't trigger assimilation.

b) What does the pronunciation of these consonants have in common which distinguishes them from the others? **2 points**

They are made by blocking air with front of tongue [against upper teeth or upper gums]

**Task 3.** Write the appropriate form of the definite article before each of the following Maltese words: **7 points (0.5 x 14)**

<b>il</b>	lura	(back)	<b>in</b>	nifs	(breath)	<b>ix</b>	xkora	(sack)
<b>l</b>	ors	(bear)	<b>l</b>	għajn	(eye)	<b>l</b>	ilma	(water)
<b>il</b>	kafè	(coffee)	<b>l</b>	hena	(happiness)	<b>li</b>	mniher	(nose)
<b>id</b>	diam	(darkness)	<b>it</b>	tama	(hope)	<b>ix</b>	xemx	(sun)
<b>il</b>	beraq	(lightning)	<b>il</b>	missier	(father)			

**Task 4.** Does Maltese treat the sound written as 'j' as a consonant or a vowel? Give two pieces of evidence to support your answer. **3 points: if correct answer (i.e. 'vowel') and if both pieces of evidence given. 2pts if only one. No points if no evidence given even if 'vowel' is given.**

'j' is treated as a **vowel (1pt)**

because

(1) a word starting with 'j', e.g. 'l jum', has the definite article form 'l' which is also used with other vowel initial words, and

(2) words starting with a consonant followed by 'j' has the same definite article form as words starting with a single consonant, e.g., il vjola 'the violet'.

(Give marks if explanations are along these lines)

## &lt;2&gt; Venturing into the Unknown (1/2) 12 points

Computers, like humans, often encounter words they have never seen before, which can pose a challenge for the computer's understanding of language. One approach for handling novel words is to use a *character-level* model of language: Whereas word-level models treat words as non-decomposable units, character-level models can learn how individual letters (or chunks of letters) work together to create word meaning. For example, if a character-level model encounters the novel word *non-walruslike*, it could figure out its meaning based on the meanings of smaller chunks (*non-*, *walrus*, and *like*).

However, such a model might make mistakes if it breaks the word down incorrectly. The table on the left shows a list of words that a hypothetical character-level model might interpret incorrectly, while the table on the right shows (in random order) the definitions it might generate.

1.	battery
2.	biking
3.	bowling
4.	conundrum
5.	decent
6.	divergent
7.	extent
8.	idealist
9.	incoming
10.	message
11.	missing
12.	mistrust
13.	preached
14.	pronouncement
15.	properties
16.	protractor
17.	puffiness
18.	resting
19.	trivial
20.	unison
21.	weeknight

A.	ordered group of notions
B.	small arrow-shooting device
C.	having two male monarchs
D.	item sharing the role of being a beaten instrument used by female religious figures
E.	did hurt beforehand
F.	in favour of a large farm vehicle
G.	not attending
H.	sharply wound once more
I.	era of disorder
J.	like pancake-making material
K.	remove pennies from
L.	courteous man who descends below water
M.	having three small glass containers
N.	flaky reddish material created by water droplets
O.	small horseman
P.	material bind together <i>I, you, she, he, etc.</i>
Q.	improperly produce a tune
R.	former cloth dwelling
S.	appropriate pieces of neckware
T.	female northern bird
U.	having one male child

## &lt;2&gt; Venturing into the Unknown (2/2)

**Task 1.** Match computer-generated meanings to the input words by placing the letter associated with the 'meaning' under the number associated with the word.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
J	C	B	D	K	L	R	A	G	I	Q	N	E	P	S	F	T	H	M	U	O

10 pts (0.5 for each correct - up to 20 (21st must be correct if 20 correct))

**Task 2.** What English words might this model define as:

A. having two male children      **BISON**

B: did hurt once more      **REACHED**

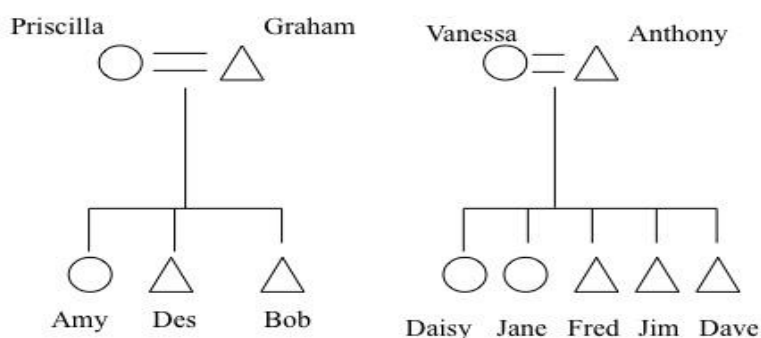
2 points (1pt x 2)

<3> Australian Kin-tax<sup>3</sup> (1/3) 15 points**PART I: Murrinhpatha**

Murrinhpatha is a language spoken as a *lingua franca* by 2500-3000 people in the Daly River area of Australia's Northern Territory, especially in towns such as Wadeye (formerly called Port Keats) and surrounding communities.

In the Murrinhpatha language, verbs have different forms reflecting the family relations among the people involved.

Here are the names of parents and children in two Murrinhpatha families:

**Murrinhpatha families**

Each of the following sentences means that the people involved 'are teaching each other'.

- a. Fred, Jim i Dave puddenyithnu.  
'Fred, Jim and Dave are teaching each other.'
- b. Des i Bob puddenyithnu.
- c. Daisy i Jane puddenyithnu.
- d. Des, Bob i Fred puddenyithnuneme.
- e. Amy, Daisy i Jane puddenyithnungime.
- f. Amy, Des i Daisy puddenyithnungime.
- g. Des i Fred puddenyithnunintha
- h. Amy i Daisy puddenyithnungintha.
- i. Amy i Fred puddenyithnungintha.
- j. Amy i Des puddenyithnungintha.

<sup>3</sup> Created by John Mansfield (OzCLO).

<3> Australian Kin-tax (2/3)

**Task 1.** Write the correct form of the **verb ending** if required for these combinations of people.

			<i>missing verb ending</i>
a)	Bob i Jim .	puddeniyithnu	nintha
b)	Des i Daisy	puddeniyithnu	ngintha
c)	Bob, Jim i Dave	puddeniyithnu	neme
d)	Fred i Dave	puddeniyithnu	
e)	Jane i Dave	puddeniyithnu	ngintha
f)	Des, Jane i Fred	puddeniyithnu	ngime
g)	Daisy, Jane i Sue	puddeniyithnu	ngime

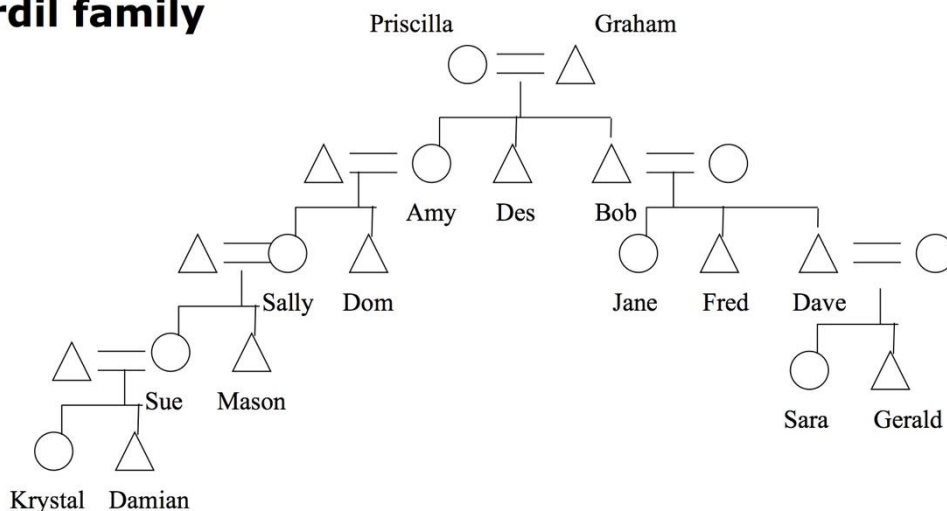
**7 points (1pt x 7)**

**PART B: Lardil**

The Lardil language is one of the Tangkic languages spoken mainly on Mornington Island in the Gulf of Carpentaria area of Queensland, Australia.

Here is one extended family of Lardil people.

**Lardil family**



Here are the ways of saying 'them' for different combinations of family members:

<i>piri</i>	<i>ninki</i>	<i>pili</i>	<i>pilmu</i>
Priscilla+ Dom	Priscilla+ Amy	Amy+ Bob+ Sue+ Mason	Priscilla+ Amy+ Des
Amy+ Des	Amy+ Damian	Sally+ Jane+ Fred+ Krystal	Sally+ Sue+ Mason+ Damian
Sally+ Fred	Dave+ Gerald		Sally+ Dom+ Jane+ Dave+ Sara

## &lt;3&gt; Australian Kin-tax (3/3)

**Task 2:** Give the correct form of 'them' for the following combinations of relatives:

	<i>them</i>	
h)	pilmu	= Bob, Sally, Dom, Jane, Fred
i)	piri	= Mason, Sarah
j)	ninki	= Des, Damian
k)	pili	= Amy, Des, Gerald
l)	piri	= Graham, Krystal
m)	ninki	= Bob, Jane
n)	piri	= Sarah, Gerald
o)	pili	= Priscilla, Graham, Jane, Dave

**8 points (1pt x 8)**

## &lt;4&gt; Mayangna (1/2) 24 points

Mayangna is a Misumalpan language spoken in the central American countries of Nicaragua and Honduras by around 8700 speakers.

A **pipante** is a small wooden boat rowed with shovels and a **guapote** is a type of edible freshwater fish, sometimes called a wolf cichlid.

Read the English sentences below with their translations in Mayangna, then answer the questions below.

Mayangna	English
1. kuring man yaihmat yak yamtasyang.	<i>I do not make a pipante next to you.</i>
2. yang dakiwan ulamak balna kaswi yang mikit yak.	<i>My master eats clams above me.</i>
3. kubamhni balna mukus balna yayamwaski witingna yaninamak taanit yak.	<i>The owls do not make clouds in front of their farm.</i>
4. yangna dikitna yak witing palani da-kaasman.	<i>You do not hear his raft under us.</i>
5. man kammapani wainiku man mamat yak buiwi.	<i>Your company shakes the moon above you.</i>
6. yang kuringki yaihnit yak wakurusni balna bukna kurahtayang.	<i>I open the scorpions' book next to my pipante.</i>
7. man walamabis yang pinkisil talwaski witing daniwan balna yaihnitna yak.	<i>Your son does not see my pencil next to his masters.</i>
8. mukusni balna witing sunipai balna dakakaawi palani kinit yak.	<i>The clouds hear her spiders under the raft.</i>
9. man sumalu balna kisauri kakaswi yang dangkit yak.	<i>Your dogs eat coriander behind me.</i>
10. man mumalalah yang yaihkit yak kastasman.	<i>You do not eat your guapote next to me.</i>
11. was supai balna taanitna yak da-kaaman.	<i>You hear water in front of spiders.</i>
12. yamak yak yang titinghki wakisa talwi.	<i>My grandmother sees a banana at a farm.</i>



## &lt;4&gt; Mayangna (2/2)

**Task 1.** Translate these sentences into English: **9 points (3pts x 3) Remove 0.5pt for each error (up to 3)**

a) waiku daka-yang man da-ma-t yak.

*I hear a moon below you.*

---

b) ulamakni man kubamh-ma yaih-ni-t yak bui-ta-man.

*You shake the clam next to your owl.*

---

c) man waki-ma-sa tala-s-yang-na yang wala-ki-bis balna taa-ni-t-na yak.

*We do not see your banana in front of my sons.*

---

**Task 2.** Translate these sentences into Mayangna: **15 points (5pts x 3) remove 0.5 for each error up to 5 pts**

d) Our masters do not open the clouds in front of us.

*[yang-na da-ki-na-wan balna] [mukus-ni balna] [ku-ra-rah-wa-s-ki] [yang-na taa-ki-t-na yak].*

---

e) You make the dog's raft next to the water.

*[was-ni yaih-ni-t yak] [su-ni-lu palani] [yam-ta-man].*

f) I shake pencils above your (pl) grandmother.

*[pinsil balna] [bui-ta-yang] [man-na titingh-ma-na mi-ni-t yak].*

---

Further explanations:Syntax

(PP) S O (PP) V (PP) word order

PP can appear in all positions except between S and O (PP is marked by locative marker *yak*).

**NOTE:** allow any of the possible word orders in d) to f).

Nouns

Definite + possessive markers for nouns are infixes with the nouns. There is no phonological rule for the location of the infixing, but instead each word has a specific location where all infixes go. For example, the word *su-lu* (dog) has all infixes placed in between the two syllables (e.g. *sunilu* = the dog, *sukilu* = my dog, etc).

Plural is expressed with the word *balna* which follows the word.

	1st person	2nd person	3rd person
Singular	-ki-	-ma-	-ni- (also the definite article)
Plural	-kina-	-mana-	-nina-

In the case of the location words, the plural affix *-na-* is suffixed (e.g. *mi-ki-t-na*).

Possession: Possessor + Possessee (marked as above)

Two location words also undergo vowel harmonising in the 2nd person (*mi-ma-t* > *mamat*, *di-ma-t* > *damat*).

Verbs

positive negative	1st	2nd	3rd
Singular	-(ta)yang -(ta)syang	-(ta)man -(ta)sman	-wi -waski
Plural	-(ta)yangna -(ta)syangna	-(ta)manna -(ta)smanna	as 3s but with stem reduplication

In the 3rd person plural, the final syllable (CV only) of the stem is reduplicated:

*tal* > *tatal*

*yam* > *yayam*

(*bui* > *bubui*)

*kurah* > *kurarah*

*kas* > *kakas*

*dakaa* > *dakakaa*

The syllable coda/vowel length is deleted in the reduplication. The *-ta-* suffix is not present in the verbs *hear* or *see* (the fact they are both verbs of perception is actually a coincidence).

<5> The Afrihili Word Machine<sup>4</sup> (1/2) 19 points

In 1970, a Ghanaian historian named Kumi Attobrah designed a Pan-African auxiliary language which he named Afrihili. As was the case with Esperanto (the most widely spoken constructed international auxiliary language devised in 1887 by L. L. Zamenhof), Attobrah decided to solve the problem of having to create a large number of unique words by developing an elaborate system of inflections and derivations for making new words.

Below are some words in Afrihili with their English translations:

adu	<i>tooth</i>	ikalini	<i>pens</i>
ajamuri	<i>republic</i>	ijamura	<i>president</i>
akalini	<i>pen</i>	ilengi	<i>horses</i>
amadu	<i>dentist</i>	imukazi	<i>girls</i>
amkate	<i>bread</i>	isabamatu	<i>shoemaker</i>
amola	<i>children</i>	ishule	<i>school</i>
amukamo	<i>kingdom</i>	uruzi	<i>river</i>
aturesine	<i>bouquet</i>	olengi	<i>horse</i>
afidi	<i>machine</i>	uruzindi	<i>stream</i>
emeli	<i>ship</i>	oluganda	<i>dialect</i>
emelisini	<i>fleet</i>	omola	<i>child</i>
eshuli	<i>principal</i>	omukazi	<i>girl</i>
eture	<i>flowers</i>	ukulimama	<i>farmer</i>
enti	<i>date tree</i>	omuntu	<i>man</i>

**Task 1.** Fill in the gaps in the table below: 10 points (1pt x 10)

English	Afrihili
machinist	afimadi
ships	imeli
presidents	ajamura
flower	ature
baker	amkamate
group of girls	omukazisini
date fruit	entindi
language	oluga
shoe	isabatu
king	omukama

<sup>4</sup> Created by Michael Salter (NACLO).

## &lt;5&gt; The Afrihili Word Machine (2/2)

**Task 2.** Below are three more Afrihili words and three options for a likely translation of the word. Pick the most likely translation to be correct, and explain your choice. (Write appropriate letter in box on right and explanation on lines below). **6 points: 1 pt for each correct choice (1pt x 3) and 1 pt for each correct explanation/justification. (1pt x 3)**

1. imulenzi

(a) fruit (b) boys (c) bridge **B**

Identical initial and final vowel => plural form.

2. aposino

(a) baggage (b) classroom (c) parent **A**

The suffix *-sin-* is used to derive collective nouns.

3. iwelemase

(a) book (b) library (c) librarian **C**

The *-ma-* infix is used to derive nouns of profession.

**Task 3.** Briefly describe *three* things you have learned about the structure of Afrihili words.

**A. Inflectional morphology:**

a. Plural formation: Final vowel replaces initial vowel of singular form.

**B. Derivational morphology:**

a. Head of an organization: Final and initial vowel of root noun are reversed.

b. Nouns of profession: Infix *-ma-* is inserted in penultimate position.

c. Collective noun: Suffix *-sin-*+final vowel of root noun.

Diminutive noun: Suffix *-und-*+final vowel of root noun.

**ANY 3 OF THESE: 3 points (1 pt for each)**

<6> Can you know Hanunó'o?<sup>5</sup> (1/1) **15 points**

The Hanunó'o script is an indigenous Filipino script used to write the Hanunó'o language. Traditionally, Hanunó'o was written by carving characters into strips of bamboo. Consequently, Hanunó'o is written vertically, as opposed to horizontally like the English alphabet.

Below on the left is a list of Filipino cities written in Hanunó'o in random order. On the right is the same list in Latin script in a different order. Note that there are two extra cities in the Latin list!

1	2	3	4	5	6	7	8	9
Ⓜ	Ⓜ	Ⓜ	Ⓜ			Ⓜ		Ⓜ
Ⓟ	Ⓟ	7	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓜ	Ⓜ
Ⓟ	Ⓟ		Ⓟ	7	Ⓜ	Ⓟ	Ⓟ	Ⓜ
Ⓜ	Ⓜ	Ⓜ	Ⓟ	Ⓜ	Ⓜ	-	Ⓟ	Ⓟ
Ⓜ	Ⓟ	-	Ⓟ	Ⓜ	Ⓜ	Ⓜ	Ⓟ	Ⓟ

- A. Manila
- B. Lubang
- C. Rumbang
- D. Paluan
- E. Kaingal
- F. Marikit
- G. Pasig
- H. Magsikap
- I. Tubili
- J. Mimaropa
- K. Sablayan

**Task 1.** Indicate the correspondences by matching the letters with the numbers.

1	2	3	4	5	6	7	8	9
<b>H</b>	<b>K</b>	<b>C</b>	<b>D</b>	<b>I</b>	<b>A</b>	<b>F</b>	<b>G</b>	<b>E</b>

**8 points (1pt x 8) 8 points if all correct; give 1 point for each correct up to 8**

**Task 2.** Write the following Hanunó'o words in the Latin Script.

10	11	12	13
	Ⓟ	Ⓜ	Ⓜ
Ⓜ	Ⓜ	Ⓟ	Ⓟ
Ⓟ	Ⓜ	Ⓜ	7
	Ⓜ	Ⓜ	Ⓟ

10.	<b>kang</b>
11.	<b>manimisu</b>
12.	<b>mangyan</b>
13.	<b>sibuyan</b>

**7 points (1 pt for 10 and 2 pts for 11, 12, 13)**

<sup>5</sup> Created by Ethan Chi (NACLO).