

Tiraynta Maansada

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Afeef: Bashirow guntaa laga fantaa, geed haddaad koriye¹ — (Gantaal, 115; Max'd-Daahir Xasan).
Waa sida meeriskaasu yeedhshay hannaanka ay warqaddani u qorantahay. Xogta ay xambaarsantahayna waa ay ka gungaadhaysaa. Sida kale, maansadeennu waa bade, yaan loo qaadan in ay warqaddanu wada kulmisay aqoon kasta oo maansada lagu saafto.

Hordhac

Meeris walba oo maanso ah, hal illaa dhawr erey ayaa laga helayaa. Erey kastana waxa loo falfalliiri karaa alamo (hadduusan hal alan ka koobnayn); alamadana higgsaado tibxo² (xarfo) ah. Tibxuhuna waa kuwa leh shibbanayaal iyo shaqallo. Shaqalladuna shan dhaadheer iyo shan gaaggaaban ayey kala yihiin. Tibxaha waxaa kamid ah laba tibxood oo *labebo*³ ah. Waana "W"-da iyo "Y"-da, oo iyagu marna sida shibbanayaasha u hawlgala, marna sida shaqallada. Labadan tibxood oo ku milan qodobada *ay, aw, ow, i.w.m.*, waxa ay marna u dhaqmaan sida alamo shaqaldheerayaal leh, marna sida alamo shaqallo gaaggaaban leh; waxa ayna kolkaas yihiin dhafanayaal gadaal, dhex iyo horaba kaga dhafan ereyada.⁴

Marka maanso la miisaamayo, xeerarka habdhiska maansadu waxay ka duulaan alamada askuma ereyada.⁵ Alamada waxa loo kala jajabshaa higgsaado ka dhalan kara tibxo saafi ah oo shaqallo ah (oo gaaban iyo dheerba leh) iyo tibxo isku-jir ah oo shaqal iyo shibbaneba leh. Marka erey alamo loo kala jajabinayo, waa lagama-maarmaan in higgsaad kasta goonnideed loo sooco, iyada oo tibxaha labanlaabma mar kasta la kala fujinayo, sida ku cad shaxankan soo socda:

Shaxanka 1^{aad}: Alamaynta Ereyada

Ereyo	Alamo Toosan	Alamo Weecsan	Tirada Alamada
aabbe	aab/be	aabb/e	2
ayeeyo	a/yee/yo	ay/eey/o	3
eebo	ee/bo	eeb/o	2
goobataal noqo e	goo/ba/taal no/qo e	goob/a/taal noq/o e	6
habowga	ha/bow/ga	hab/ow/ga	3
manalagaraadbaa	ma/na/la/ga/raad/baa	man/a/la/gar/aad/baa	6
sandulle	san/dul/le	san/dull/e	3

Sida ku cad shaxankaas kore, alamada toosan iyo kuwa weecsani waa ay is tiro le'egyihiin. Sida ay labadu u kala gedisanyihiinna waa la dhadhansan karaa higgsaadda awaadeed.

Meeris walba oo maanso ah alamada ku jira waxa loo muujisan karaa sida ay alamadaas toosani u sawiranyihiin. Tusaale ahaan,

ga/bow/da/ye too/bad/dow gu/do eey – (10 alan)

hal/kay/gaan ku su/ga/yaa – (7 alan)

la/gu mood ma/caa/ney jan/na/da, mi/ri/hi saar/raa/ye – (15 alan)

Immika kolkaas waa inoo walalac in alamadu yihiin sarabka meeriska maansada iyo waliba afka oo idil ereyadiisa. Xeerka koowaad ee aragtida BSr. Carraale ee miisaanka maansaduna waxa uu ku giijisanyahay alamada guud ee meeriska (sida kuwa dusha ku cad) oo loo wehel-yeelo alamada wata shaqallada dhaadheer (amma dhafanayaasha dhaadheer). Waxa halkaaasna ka soo baxa inta *nudood* ee meeriska maansada la gorfeenayo yeelan karto. Tusaale⁶ ahaan, jiiftadu waxay leedahay shan nudood (sal) oo kala ah:

1. *duufaan ka guurkii* (5 alan, 4 kamid ihi wataan shaqaldheere)
2. *Nuux iyo gadaashii* (6 alan, 3 kamid ihi wataan shaqaldheere)
3. *meeshuu ku kala go'ay* (7 alan, 2 kamid ihi wataan shaqaldheere)
4. *baddi jiidhay gebiyada* (8 alan, 1 kamid ihi wato shaqaldheere)
5. *dhaqamada is geli kara* (9 alan, 0 kamid ihi wato shaqaldheere)

Alamada tusmayntooda ka sokow, marka alamada loo kala qaado alamo wata shaqaldheerayaal iyo alamo wata shaqallo gaaggaaban, waxa tiraynta maansada u *sabab* ihi waa alamada wata shaqallada dhaadheer kala jjabkooda (waa hadday dhacdo e) iyo raceynta nudda ay ka tirsanyihiin. Balse marka ugu horraysa waa in aan dul joognaa nudda koowaad ee meeriska maansada inoo soocan, si marka aynu nuddaas hal alan oo shaqal dheer leh ka kala jabinno ay inoogu soo baxdo nudda labaadi. Marka aan nuddan labaad dul joogno, inta raceyn ee aan u qori karnaa meeriska waxa aan ku magcaabaynaa *tax*. Kolkaas wadarta taxaha nudaha oo dhan ee maansadaas waxa aynu ku magcawney *tirayn*, oo ah *aragti-ku-doonka* dhammaan meerisyada⁷ ay maanso xamili karto. Maansooyinka qaar, sida jiiftada, tirayntooda meeris *saleedi* waa ay sugantahay, oo aragti-ku-doonkooda iyo inta tusaalayaal ah ee jira, amma maanso hore laga soo xuli karo, waa ay is celiyaan.

Cagta Meeris Saleedyada

Marka aad darsayso maanso, waxa muhiim ah in aad si dheer u dhugato qaabdhismeedka meerisyo badan oo maansadaas ku dheelmada. Ugu horrayn, haddii aad la kulanto meerisyo aysan alamada guud iyo kuwa shaqallada dhaadheer wata isu dheellitirnayn, oo aysan wadartoodu tiro keliya u *dhawdhaween*, waxa dhab ah in aad maansooyin [marka laga reebo maansada geeraarka iyo kuwa la mid ka ah] kala jira isla jirinayso. Meerisyada jiiftada ah ee kor ku xusan, wadarta 5 iyo 4 waa 9, 6 iyo 3-na waa 9, iyo kuwa hadhsanba. Tani macnaheedu waa in *dheellitir* uu ka dhex jiro alamada guud iyo kuwooda iyagu wata shaqallada dhaadheer ee meeriska, oo marka *qaybi is dhintaba, qaybta kale kobcayso*.

Waxa se jirta, in xeerka koowaad ee maansadu garab u baahanyahay, oo aadan kelidiis ku saafan karin maanso kasta. Waayo waxa aad dhisi kartaa meeris aan jiiftana ahayn, xeerka koowaadna aan burinahayn. Tusaale: *Anaa ubax keenaye*, waa meeris leh nudda toddoba-labaale (7,2), balse dhutis ba'ani ku jiro, oo laaxin la ciiraya, haddiiba jiipto lagu sheego. [Waxaaba laga yaabaa in uu meeriskaasu ku sal leeyahay maanso kale, oo haddii la sii tixayn karo u tixmaysa: *Anaa ubax keenaye / adaan urinhaynine lasaan arkihaynine ...*]

Waxa aad kolkaas u baahantahay waa xeer labaad. Waana xeer uu B.Sr. Carraale tiraab ahaan inagu garwaaqsiyey; xeerkaas oo jidaynaya hogag ay alamada shaqallada dhaadheer lihi degayaan iyo hogag aysan degi karin. Walibana waa xeer jidaynaya in alamada mar walba wata shaqallada gaaggaaban ay hogag cayiman leeyihiin. Marka lasii feento xeerkana, waxa soo baxaya hogag meeriska kamid ah, oo ay laba alan oo shaqallo gaaggaaban kala sita marwalba is xigayaan; isumana baddalaan alan shaqal dheer leh.

Xeerkan labaadi waa xeer asaasi u ah miisaamista maansada. Waxayna mucda xeerkan labaadi ku urursantahay *tusmaynta meeris guud*, oo aan *cag* ku magcaabayno immika. Tusaale ahaan, jiiftada meeriskeeda saleedi waxa uu yeelanayaa cagta ah:

uu uu u uu uu

waa marka ay “u” u taagantahay alan shaqal gaaban leh, halka ay “__”-na tahay calaamad u taagan alan markastaba shaqal dheer wata; calaamadda “uu”-na waxa ay u taagantahay alan shaqaldheer wata, isla markaasna u kala qaarmaya laba alan oo shaqallo gaaggaaban kala sita . [Waa cag afmaalku maansooyinka qaabdhismeedkooda ku saafto, oo *shubaasha* ku muujisto; *scansion*.] Kolkaas, waxa inooga cad cagtaas in ay shantii alan ee uu meeriska nudda koobaad ee jiiftadu ku salaysnaa *iyo* aftartii alan ee watay shaqallada dhaadheer iskuwada shubeen meesi keliya. Eegga, cagtaas oo aynu kolba nud u furfuranno (marka aynu hal, laba amma in kabadan oo alan oo shaqal

BSr. Carraale¹³ waxa uu xoogyeeelaa in *shaqal* [ku tirsan (haddii la helayo) alan dheeraha *la deriska* ah guntinta faqadka ah, sida aan *dhugtay*] uu mas'uul ka yahay farcannimada meeriska, oo marka faaltuug lagu xado [oo *mararka qaar* uun sallaxan] isu baddala meeris sal ah. Tusaale:

(8,1) *donnidi la raran jiray* [ammaba sidan kale]

(8,1) *doonnidi la raran jiray*.

Ogaal waa: meerisyada qaar in ay farcan yihiin ayey kaga qumanyihiin in faaltuug lagu xado, oo kuwo sal ah laga yeelo.

Tiraynta iyo Tubaabka¹⁴ Raceyn

Mar haddii aynu haysanno cag, way fududdahay sida tirayn loogu helayo cagtaas. Tusaale ahaan, heesta ugu alamada yar ee “Mooyaha,” waxa aan u helaynaa cag ah:

UU UU

Tusaalayaashuna waa:

(2,2) *mooyaan* nudda 1^{aad}
(3,1) *magacii* nudda 2^{aad} – taxa 1^{aad}
(3,1) *ciil tiri* nudda 2^{aad} – taxa 2^{aad}
(4,0) *calaliye* nudda 3^{aad}

Heestaasi saddex nudood uun bay leedahay; oo ay nudda koowaad iyo ta' saddexaadi wataan midba hal tax, halka nudda labaadna ay ka wadato laba taxood. Sidaaas daraadeed, dhammaan meerisyada ay maansadaasu xamili karto tiroba waa 4—oo ah wadarta taxaha.

Tubaab ahaan, annaga oo aan maanso walba meerisyadeeda oo idil wada tixin ayaannu heli karnaa tiraynteeda. Habka aan tan ku gaadhi karnaana waa raceyn, oonnu waliba heer sii fudud gaadhsiin doonno.

Raceyntu (combination) waa habayn amma xulid tiro waxyaaleed iyada oo aan la danaynayn horsanaan.¹⁵ Tusaale, racaynta {1,2,3} oo marba laba tiro la isku qabto waa: {1,2}; {1,3}; {2,3}. Haddii horsanaanta la danaynayo, waxa la helayaa raabaqaadka (permutation-ka) ah: {1,2} iyo {2,1}; {1,3} iyo {3,1}; {2,3} iyo {3,2}.

Haddii aynu meeris maanso ah ku haysanno *xagag* dhawr ah, n xagagood, oo aan xagaha kolkaas kala dhambalmaya ee kuwaas ku tirsanna ka soo qaadno k xagagood, debadeed xulashada aan k uga soo xulan karno n waa raceynta:

$$C(n, k) \equiv \binom{n}{k} \equiv \frac{n!}{k!(n-k)!} \quad (C),$$

taas oo $n!$ ay tahay abnaqanka ah: $n! = n \times (n - 1) \times \dots \times 2 \times 1$. Sida kale $k! = k \times (k - 1) \times \dots \times 2 \times 1$. Qeexaal ahaan, $0! = 1$.

Qaabaanka (C) waxa aynu ku helaynaa *inta tax* oo aynu ka heli karno *nud kasta*. Tusaale ahaan, nudda 1^{aad} ee heestaas kore waxa aan haysannaa 2 xag iyo 0 alan oo kuwaas kamid ahi kala jabayo. Dabadeed, qaabaanka (C) waxa uu ina siinayaa:

$$\binom{2}{0} \equiv \frac{2!}{0!(2-0)!} = \frac{2!}{1 \times 2!} = 1.$$

Waana runoo, nuddaas koowaad waxa aan ku haysannay hal tax. Nudda labaad u gudub: 2 xag iyo 1 alan oo kuwaas kamid ahi kala jabayo. Debadeed,

$$\binom{2}{1} \equiv \frac{2!}{1!(2-1)!} = \frac{2!}{1 \times 1!} = \frac{2 \times 1}{1 \times 1} = 2.$$

...

Sidaas ayey nud waliba u yeelanaysaa *inta tax* ee ay yeelan karto. Haddii aynu ku noqono nudda labaad ee jiiftada, oo aynu haysanno 4 xag iyo 1 alan oo kuwaas kamid ah oo kala jabaya, waxa aan helaynaa,

$$\binom{4}{1} \equiv \frac{4!}{1!(4-1)!} = \frac{4!}{1 \times 3!} = \frac{4 \times 3!}{1 \times 3!} = 4.$$

Aynu tijaabinnee, saw kuwan taxaha¹⁶ nudda labaad ee jiiftadu:

abbayaal awowyaal ∪ ∪ ___ ∪ ___ ___

waad heli abaalkaa ___ ∪ ∪ ∪ ___ ___

ay doog leh ku ekaa ___ ___ ∪ ∪ ∪ ___

deelqaafka ceebtiyo ___ ___ ∪ ___ ∪ ∪

waana in xagta qudha ee kala jabtaa marba hog ka degayo affartaas qaabtaxan ee nudda *labaad*.

Sida haddana soo korodhay, waa waqti lumis in aan nud kasta goonnideed u baadhno, waayo waxaa jira maansooyin yeelan kara illaa shan nudood (hojiska gabayga matalan) iyo wax ka badan. Waxaana habboon in aan u daadegno fududaynta iska

sallaxan ee raceyntaas kore. Waxa aan u golleenahayna waa helista tirayn, oo ah wadarta dhammaan taxaha meeriska maansada.

Aragtiin baa odhanaya:

$$\sum_{k=0}^n \binom{n}{k} = \sum_{k=0}^n \frac{n!}{k!(n-k)!} = 2^n,$$

oo isugu-soo-biyashubtay in tiraynta maanso kastaa noqon karto, aragti-kudoon ahaan, *laba lagu jibaaray tirada xagagga*. Tusaale, maansada “Mooyaha” waxay leedahay 2 xag, ugu badnaan. Debadeed maansadanu waxay leedahay tirayn sugan oo ah: $2^2 = 4$. Jiiftada tiraynteedu (marka aynu ka hadalno meeris saleedkeeda) waa $2^4 = 16$. Hojiska (salka ah ee) gabayga tirayntiisu waa $2^5 = 32$; hoorisku *hal* nud ayuu leeyahay oo ah (6,2), nuddaasina waxay sidataa saddex xag oo *mar kasta* midi kala qaarmayo. Deeto tiraynta hooriska gabay waa raceynta nuddaas oo saddex taxood dhasha. [Haddii hojis kasta lagu nabo saddexda tax ee hooriska, *geddi* meeris-saleedyada gabaygu tiroba waa $3 \times 32 = 96$.]

Dhanka kale, dhaantada, oo xagaggeeda la gaadhsiiyo 6 marar badan (marar kalana 5), tiraynta u qoondaysmaysa waa $2^6 = 64$. Hasayeeshee, tusaalayaal tobaneeyo dhan ayuunbaa illaa iyo immika warshadaysan, *oo soo laablaabta*. (Sidaas daraadeedna, in badan oo tiraynta dhaantada iyo maansooyin kalaba kamid ah waa aragti-kudoon, oo la macno ah, *waa suurtagal in la helaa, balse lama hayo!*)

Maansooyinka hadhsan, mar haddii la rakibo cagtooda, tirayntooda habkaas kore ayaa loo marayaa.

Fududayn kale ayaa ah in *tiraynta iyo nudaha* isku mar looga bogan karo saddexagalka Pascal ee isagu u dhigan qaabka:

Shaxanka 2^{aad}: Saddexagalka Pascal

Maansada (Sal)	Jiif: Maansada nudaheedoo idil Joog: Nudaha iyo inta meeris ee ku taxan									Tiraynta (wadarta tirooyinka jiifka)		
					1					2^0	1	
				1		1				2^1	2	
Mooyaha, ...			1		2		1			2^2	4	
Shubaal, ...			1		3		3		1	2^3	8	
Jiifto, Haan, ...		1		4		6		4	1	2^4	16	
Hojis Gabay, ...	1		5		10		10		5	1	2^5	32

Waxa saddexagalkaas kore ka muuqda (laga bilaabo maanso yeelata 2 *xag*) illaa maanso yeelan karta 5 *xag* (iyo 6 *nudood*); waana la sii wadi karaa. Sida jirta, suurtagal ma’aha in la soo wado helo meeris kasta oo ay tirayntu oggolaato, *balse mid mid waa la curin karaa*.

Sida kale, waa in aan ogaannaa in ay nuduhu yeeshaan meerisyo kala hufnaan badan, oo haddana ku kala badan kolba maansooyinka ay ku jiraan. Waxaana sal ah in meeris walba oo 5 xag iyo kabadanba leh ay adagtahay ku dhawaaqiddiisa nudda ugu dambaysa (waa hal halka degaandegga midig ee saddexagalka); badanaana lamaba helo. Tusaale ahaan (hojiskan gabay):

(18,2) *sabarrada dusha u xiga Cadani*, saylad waw ahayde.

Kolkaas gabyaagu curinta meeris sidaa u ciriiriya waxa uga sallaxan, luuqduna aysan uga cabbudhmaynin, curinta meeris faalal ah, sida: (15,5) *caawana balaan meel ka saro, taan siddayn jiraye*.¹⁷

[Waxa xusid mudan in ay tiraynta maansadu sii badanayso, *illaa xad*, marka uu meesha soo galo meeriska farcanka ah (iyo dhawrkiisa meelgal), oo aynaan ku furfurin qoraalkan.]

Haddii aynu soo jiririqinno, hadafka ugu muhiimsan ee tirayntu waa *xog ururinta* (qabyada amma dhammayska ah ee) dhismaha maanso kasta, oo la muujinayo, aragti ahaan, meerisyada ay yeelanayso, sida ku cad shaxannada Darsiimo.¹⁸ Waxayna taasi dhacaysaa kolka cagta dhisiddeeda lagu guuleysto (kadib marka la isticmaalo xeerarka Miisaanka Maansada), oo si deggan loo hubiyo.

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DARSIIMO

SHAXANKA 1^{aad}

TIRAYNTA BAH-MAANSAHA MEERIS-SALEEDKA MAQALEEY WARLAAY								
TUSMADA GUUD EE MEERIS-SALEEDKA MAQALEEY WARLAAY: ---•---								
TIRO	NUDDA	C(n,k)	TXJ ^I	HXJ ^{II}	TUSMO	TUSAALEYAAL*	TAXA	
1	1aad	(4,3)	{3,0}	0	0	---•---	Guullow Allow	1
2	2aad	(5,2)	{3,1}	1	1	••••---	guri roon nagee	3
3					2	---•---	oo gudimo taal	
4					3	---•••	oo geedo badan	
5	3aad	(6,1)	{3,2}	2	1;2	•••••---	in Cali la dilay	3
6					1;3	••••••	weli hoose iyo	
7					2;3	---••••	oo gacal fadhiyo	
8	4aad	(7,0)	{3,3}	3	1;2;3	•••••••	subagana la shubo	1

* Inta hore oo dhan waa tusaaleyaal soo-jireen ah; oo aan la qoon curiyayaashoodii. Meeriska ugu dambeeya aniga ayaa unkay.

I Tirada Xagagga kala Jaba
II Hogaga Xagagga kala Jaba (ka gelayaan cagta)

SHAXANKA 2^{aad}

TIRAYNTA BAH-MAANSAHA MEERIS-SALEEDKA JIIFTADA								
TUSMADA GUUD EE MEERIS-SALEEDKA JIIFTADA: ---•---								
TIRO	NUDDA	C(n,k)	TXJ	HXJ	TUSMO	TUSAALEYAAL*	TAXA	
1	1aad	(5,4)	{4,0}	0	0	---•---	duufaan ka guurkii	1
2	2aad	(6,3)	{4,1}	1	1	••••---	weli goobti baan naal	4
3					2	---•---	Nuux iyo gadaashii	
4					3	---•••---	geel baannu dhaqanaa	
5					4	---••••	guun soo jiraan ahay	
6	3aad	(7,2)	{4,2}	2	1;2	•••••---	ayan gacal wadaagnaa	6
7					1;3	••••••	gurgurshaannu raranaa	
8					1;4	•••••••	Canfartaan gudboonnahay	
9					2;3	---•••---	baal dahaba gelinaa	
10					2;4	---•••••	waa dhaxal an guurine	
11	4aad	(8,1)	{4,3}	3	3;4	---•••••	meeshuu ku kala go'ay	4
12					1;2;3	•••••••---	gocondhada ka sidannaa	
13					1;2;4	••••••---	isku gibilna waan nahay	
14					1;3;4	••••••••	baddi jiidhay gebiyada	
15	5aad	(9,0)	{4,4}	4	2;3;5	---••••••	waan kala gurraannahay	1
16					1;2;3;4	•••••••••	dhaqammada is geli kara	

* Waa meerisyo aan ka soo guray jifto uu tiriyey (AHN) C/qaadir Xirsi (Yamyam).

SHAXANKA 3^{aad}

TIRAYNTA BAH-MAANSAHA MEERIS-SALEEDKA GABAYGA								
TUSMADA GUUD EE MEERIS-SALEEDKA GABAYGA: ---•---•-, -•---•								
HOJIS								
TIRO	NUDDA		C(n,k)	TXJ	HXJ	TUSMO	TUSAALEYAAL*	TAXA
1	1aad	(7,5)	{5,0}	0	0	---•---•-	guuguulihiiyow haddaad	1
2	2aad	(8,4)	{5,1}	1	1	•••---•-	annagoo taleex naal jihaad	5
3					2	---•---•-	saw magani tii gaabsataan	
4					3	---•---•-	dawdii ha darandooriyeen	
5					4	---•---•-	waayeelka dhaylada sitee	
6					5	---•---•-	gaaraabidhaan baa ku haga	
7	3aad	(9,3)	{5,2}	2	1;2	••••---•-	isuma fayno laakiin dagaal	10
8					1;3	••---•---•-	toddobaatan boqol oo darwiish	
9					1;4	••---•---•-	ta aqoonta loo gado baree	
10					1;5	••---•---•-	cilmigaa asaaggeedu gayo	
11					2;3	---•---•---•-	caawana hiyiba waa hiyee	
12					2;4	---•---•---•-	haadkiyo waraabuhu ragguu	
13					2;5	---•---•---•-	caawana bal aan meel ka saro	
14					3;4	---•---•---•-	Eebow kufriga gedefata lay	
15					3;5	---•---•---•-	Gaaroodi iyo waa la tegi	
16					4;5	---•---•---•-	qoomkii is xaasida nicmadu	
17	4aad	(10,2)	{5,3}	3	1;2;3	••••---•-	gudcurkiyo caddadu waa midkaan	10
18					1;2;4	••••---•-	gumuc kama dunney iyo rasaas	
19					1;2;5	••••---•-	gigta hore Ismaaciil Mireba	
20					1;3;4	••---•---•-	gembu wawgu ridi fulayadii	
21					1;3;5	••---•---•-	dhaladuu wax iga saaray culus	
22					1;4;5	••---•---•-	ninba goonidiis keli ra'yiga	
23					2;3;4	---•---•---•-	baallacad kelyaha kuma jareen	
24					2;3;5	---•---•---•-	waa gelengal nimankii fadhiiyey	
25					2;4;5	---•---•---•-	dhaawucu ninkuu ku cusub yahay	
26					3;4;5	---•---•---•-		
27	5aad	(11,1)	{5,4}	4	1;2;3;4	••••---•-	xadhig dacayi wuxu idin sudhnaa	5
28					1;2;3;5	••••---•-	Qabridaharre mar un baad xarrago	
29					1;2;4;5	••••---•-	ha ku guban dhe waa guluc shishiyo	
30					1;3;4;5	••---•---•-	bad kalluun ku jira kollay ku tahay	
31					2;3;4;5	---•---•---•-	waa cagaf carrada lagu qodiyo	
32	6aad	(12,0)	{5,5}	5	1;2;3;4;5	••••---•-	sabarrada dusha u xiga Cadani	1
HOORIS								
TIRO	NUDDA		C(n,k)	TXJ	HXJ	TUSMO	TUSAALEYAAL	TAXA
1	1aad	(6,2)	{3,1}	1	6	•••---•-	guriga Ciideede	3
2					7	---•---•-	ceelal dhumuc weyne	
3					8	---•---•-	saylad waw ahayde	

* Aniga ayaa hojisyada iyo hoorisyada is leh ee ku qoran farta jiifta unkay, oo waxaan waayey hojisyo ah tusaalayaal kale oo gabayo tiskaaday ku taxan. Tusaalayaasha kale waxaa kala unkay: Sayid Maxamed Cabdulle Xasan {14,15, 20,24,29}; Ismaaciil Mire {1,2,8,23,30}; Qamaan Bulxan {3}; Calidhuux Aadan {4,5,21,25}; Salaan Maxamed Xirsi (Salaan-Carrabey) {11}; Cilmi Carab Cabdi {12}; Cabdillaahi Macalin Axmed (Dhoodaan) {13,17,26,29}; Cabdilqaadir Xirsi Siyaad (Yamyam) {9,10}; Axmed Sheekh Jaamac {7,16,27,28}; Maxamed-Daahir Xasan {6,18,19,22}.

SHAXANKA 4^{aad}

TIRAYNTA BAH-MAANSAHA MEERIS-SALEEDKA DHAANTADA								
TUSMADA GUUD EE MEERIS-SALEEDKA DHAANTADA: •—•—•—•—								
TIRO	NUDDA		C(n,k)	TXJ	HXJ	TUSMO	TUSAALEYAAL*	TAXA
1	1aad	(8,6)	{6,0}	0	0	•—•—•—•—	wuxuu doonuu jitaystaayee	1
2	2aad	(9,5)	{6,1}	1	1	••—•—•—•—	<i>samada taan geeyayee gaadh-dhaa</i>	6
3					2	•—•—•—•—	haddii kale yey na jaasaynoo	
4					3	•—•—•—•—	hadduusaan jirin ma joogneeneey	
5					4	•—•—•—•—	Allow yaa qool ku jiliqeeeyoo	
6					5	•—•—•—•—	jifeeyaay waa januun falaneey	
7					6	•—•—•—•—	<i>dhulkii goysoo samaan-guurtaye</i>	
8	3aad	(10,4)	{6,2}	2	1;2	•••—•—•—	<i>adigu Hodaneey gadaal eegoo</i>	15
9					1;3	••—•—•—	<i>dunidu waa gabale guun diid hooy</i>	
10					1;4	•—•—•—	<i>“dalkaba waan soo dumine Daa’uud</i>	
11					1;5	•—•—•—	<i>ka carar daartaada oo debed aad”</i>	
12					1;6	•—•—•—	<i>ka oran waa daallin kaa xoog badan</i>	
13					2;3	•—•—•—	hadday janin wada abuuraayaan	
14					2;4	•—•—•—		
15					2;5	•—•—•—	Inuu jiro baa u waajibtayoo	
16					2;6	•—•—•—	nimaan lubbigiisu fiicnayniyo	
17					3;4	•—•—•—		
18					3;5	•—•—•—	wixii jiifa wa ogsoonyahayoo	
19					3;6	•—•—•—		
20					4;5	•—•—•—		
21					4;6	•—•—•—		
22					5;6	•—•—•—		
23	4aad	(11,3)	{6,3}	3	1;2;3	•••—•—•—	afkaba kama dhigo ammaantaadoo	20
24					1;2;4	•••—•—•—		
25					1;2;5	•••—•—•—	jinniyo insi waa khilaafsanyahoo	
26					1;2;6	•••—•—•—		
27					1;3;4	•••—•—•—		
28					1;3;5	•••—•—•—		
29					1;3;6	•••—•—•—		
30					1;4;5	•••—•—•—		
31					1;4;6	•••—•—•—		
32					1;5;6	•••—•—•—		
33					2;3;4	•••—•—•—		
34					2;3;5	•••—•—•—	ninkii labo jago jeclaysanayey	
35					2;3;6	•••—•—•—	haddii kale anigu kaa jeestayee	
36					2;4;5	•••—•—•—	dadkaan baray baa balwada tumayee	
37					2;4;6	•••—•—•—		
38					2;5;6	•••—•—•—	wixii dhulka hoose jeeb ku lihiyo	
39					3;4;5	•••—•—•—	Jaliil jaah horiyo daba malahoo	
40					3;4;6	•••—•—•—	haddii uu jirimo kula doonana	
41					3;5;6	•••—•—•—	ninkii baan ahay magaalo bartiyo	
42					4;5;6	•••—•—•—		

43	5aad	(12,2)	{6,4}	4	1;2;3;4--		15
44					1;2;3;5--	ilmadu kama iman halkaad aragtee	
45					1;2;3;6--		
46					1;2;4;5--		
47					1;2;4;6--		
48					1;2;5;6--		
49					1;3;4;5--		
50					1;3;4;6--		
51					1;3;5;6--		
52					1;4;5;6--		
53					2;3;4;5--	ninkii xarbad jilibka ugu dhigayow	
54					2;3;4;6--		
55					2;3;5;6--	ninkii jebin kara anow fasaxaye	
56					2;4;5;6--		
57					3;4;5;6--		
58	6aad	(13,1)	{6,5}	5	1;2;3;4;5--		6
59					1;2;3;4;6--		
60					1;2;3;5;6--	legiyo boqol nino walaala ahiyo	
61					1;2;4;5;6--		
62					1;3;4;5;6--		
63	2;3;4;5;6--						
64	7aad	(14,0)	{6,6}	6	1;2;3;4;5;6--		1

* Meerisyada ku qoran farta jiifta aniga ayaa unkay. Meerisyada kale waxaa kala unkay: Sayid Maxamed Cabdulle Xasan {1,3,4,5,6,13,15,18,25}; Maxamuud Diiriye Faarax (Baalbaal) {16,36,41,60}; Cismaan Abbokor Ducaale {23,44}.

Dhugasho

- ¹ Ka raadraac gabayga uu meeriskaasu ku jiro Doollo.com.
- ² Siciid Cabdi Cabdilaahi. "Gudboondhigga." <<http://tiraab.blogspot.com/2010/09/gudboondhigga.html>>
- ³ Xirsi Cali Ciise. "Afkeenna iyo Fartiisa." <<http://www.golkhatumo.com/Afka.ram> >
- ⁴ Cabdilaahi Diiriye Guuleed (Carraale). *Gorfaynta Gabayga*. Bogga 23^{aad}.
<http://wardheernews.com/Books/Carraale/Gorfaynta_Gabayga.pdf>
- ⁵ Eeg *Gorfaynta Gabayga*. Bogga 19^{aad}.
- ⁶ Waa tusaalayaal ku jiray jiipto ka sugnaatay (AHN) Cabdilqaadir Xirsi Siyaad (Yamyam).
<<http://www.allgedo.com/2010/05/21/gabay-asalka-dadka-hiddaha-iyo-dhaqankooda-by-aun-cabdiqaadir-xirsi-yam-yam/>>
- ⁷ Qoraalkan waxa aynu ku gorfeynay tiraynta meeris saleedyada oo keliyah.
- ⁸ Meeriskaas waxa loo dhigaa: *Saciira iyo Naciima*. Balse, waxa ka saxsan, oo uusan laxni ku jirin maanso ahaan, *Saciiraya Naciima*. [Dhawaq ahaan farqi ma jiro.] Dhagayso Timacadde.
<<http://www.hoygasuugaanta.com/Timocadde2.ram>>
- ⁹ Akhri Bogga 101: Giorgio Banti and Francesco Giannatasio. "Music and Metre in Somali Poetry."
<<http://www.jstor.org/pss/586655>>
- ¹⁰ Cabdi Miigane Guuleed & Maxamed Cabdillaahi Riiraash: "Habka Dhismaha Maansada Soomaaliyeed."
<<http://www.redsea-online.com/modules.php?name=getcontent&contenttype=news&id=37>>
- ¹¹ Aragtida Abwaan Maxamed Xaashi Dhamac (Gaariye) ee miisaanka maansada ayaa ina tusaysa in meeriska farcanka ihi uu jiritaankiisa leeyahay shubaaleed. Sidaas awgeedna, meeriska farcanka ihi ka salka waxa uu dheeryahay alan (amma shaqal) qudha, sida uu Abwaan Gaariye u muujiyey. Eeg bogga 4^{aad} ee jiidmadan:
<<http://www.sdwo.com/miisankamaansada.pdf>>
- ¹² Waa meerisyo ku ira jiiptada "Dibedyaal" ee uu tiriyey Maxamed Ibraahim Warsame (Hadraawi).
<<http://www.aftahan.org/author.php?aid=2&dcategory=&apid=369&PHPSESSID>>
- ¹³ Eeg *Gorfaynta Gabayga*. Bogga 36^{aad}.
- ¹⁴ "Tubaab" waa erey bixin ku habboon ereyga "xisaab."
<<http://tiraab.blogspot.com/2009/01/hababka-ereybixinta.html>>
- ¹⁵ *Xisaab: Dugsiga Sare. V1-4*. Xamar: Wasaaradda Waxbarashada iyo Barbaarinta, Xafiiska Manaahijta, 1976-1979.
<<http://webapp1.dlib.indiana.edu/metsnav/general/navigate.do?oid=VAA3466&pn=1053&size=screen>>
- ¹⁶ Saddexda meeris ee ugu horreeya waxay ku jiraan jiiptada "af qalaad ka garannuug" ee uu curiyey Ibraahim Ciise Maxamed (Ibraahim Cajaa'ib); meeriska afraadna waxa uu ku jiraa jiiptada "Dulmanaha la quudhsadey" ee uu allifay Yuusuf Cusmaan Cabdille (Yuusuf Shaacir).
<<http://jidhidhico.wordpress.com/2009/04/20/af-qalaad-ka-garannuug-ibrahim-cajaaib/>>
<<http://jidhidhico.wordpress.com/2009/02/15/dulmanaha-la-quudhsaday-yuusuf-shaacir/>>
- ¹⁷ Meeris ku jira gabayga "Salleelo" ee uu tiriyey C/laahi Macallin Axmed (Dhoodaan).
- ¹⁸ Meerisyada aan tusaalayaasha u soo qaatay inta badan waxaan ka soo guray saababka suugaanta Soomaaliyeed ee galshada (internet-ka), siiba saababka kala ah: Doollo, Golkhaatumo, Hoyga Suugaanta iyo Afatahan; meerisyada Sayidka (siiba kuwa dhaantada ah) waxaan ka soo uruuriyey buugga *Diiwaanka Gabayadii Sayid Maxamed Cabdulle Xasan*, ee uu qoray Sheekh Jaamac Cumar Ciise. Daabacaadda 2^{aad}. 1999.