

## TEST XARAKTERISTIKALARI: GEOGRAFIYA FANIDAN O'TKAZILGAN TEST SINOVLARI

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**Qisqacha mazmuni.** Mazkur maqolada 2024-yilda geografiya fani bo'yicha milliy sertifikat uchun o'tkazilgan test sinovlari natijalari klassik test nazariyasi va Rash modeli asosida tahlil qilingan. Test sinovi natijalarining tavsif statistikasi va har bitta test topshiriqlariga berilgan javoblarining umumiy ball bilan korelyatsiyasi muhokama qilingan. Klassik test nazariyasi va Rash modeli bilan o'tkazilgan uchta test sinovida ishlatilgan variantlardagi test topshiriqlarining qiyinlik darajasi tahlil qilingan. Rash modeli asosida aniqlangan qobiliyat va qiyinlik darajalaridan foydalanib, har bir variant uchun Rayt xaritalari olingan. Shuningdek test ma'lumoti va xarakteristikasi chiziqlari hamda test variantlaridagi har bir test topshiriqlarining Rash modeli bilan moslik statistikalari o'r ganilgan.

**Kalit so'zlar:** Test topshiriqlari, Kronbax alfa koefitsiyenti, qiyinlik darajasi, korrelyatsiya koefitsiyenti, Rash modeli, Rayt xaritasi, qobiliyat darajalari, Rash modeli bilan moslik.

### I. Kirish

"Umumta'lim fanlarini bilish darajasini baholashning milliy test tizimini joriy etish to'g'risida"gi qaroriga asosan Bilim va malakalarni baholash agentligi umumta'lim fanlari bo'yicha milliy sertifikat uchun test sinovlarini tashkil etib kelmoqda.

Milliy sertifikan uchun o'tkaziladigan test sinovlari natijalari klassik test nazariyasi [1-2] hamda zamonaviy nazariyalaridan biri bo'lgan Rash modeli asosida [3-5] tahlil qilinadi va test topshiriqlarining xususiyatlarini optimal holga keltirish

uchun fan mutaxassislariga taklif va tavsiyalar berib boriladi [6-8].

Avvalgi maqolalarimizda [8-14] ham umumta'lim fanlaridan milliy sertifikat uchun o'tkazilgan test sinovlari natijalari testning klassik nazariyasining va zamonaviy test nazariyasining Rash modeli bo'yicha test topshiriqlarining matematik statistik tadqiqotlari olib borilib, ularning natijalari asosida tegishli tavsiyalar, xulosalar taqdim qilingan.

Mazkur maqola ham umumta'lim fanlaridan biri bo'lgan geografiya fanidan milliy sertifikat

uchun o'tkazilgan test sinovi natijalari haqida bo'ladi. Maqolaning asosini milliy sertifikat uchun geografiya fanidan 2024-yil may (1-test sinovi), oktabr (2-test sinovi) va dekabr (3-test sinovi) oylarida o'tkazilgan test sinovi natijalari tashkil etadi. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovida 1358 nafar, 2-test sinovida 245 nafar va 3-test sinovida 701 nafar talabgorlar ishtirok etdilar. Test sinovlarida foydalanilgan har bir

variantlar 45 ta (36-45- ochiq test topshiriqlarining A va B qismlarga ajratilishi hisobiga 55 ta) test topshiriqlaridan iborat bo'lib, ajratilgan vaqt javoblar varaqasini bo'yash bilan birgalikda 150 daqiqadan iborat bo'lgan.

Geografiya fanidan milliy sertifikat uchun o'tkazilgan 3 ta test sinovi natijalari asosida klassik test nazariyasi hamda Rash modeli bilan aniqlangan test xarakteristikalari o'rganib chiqilgan.

## **II. Test sinovlari natijalarini klassik test nazariyasi asosida tahlili**

Pedagogik o'lchovlarning nazariy asoslariga ko'ra har bir test bo'yicha tuzilgan test topshiriqlari mazmuni ekspert tekshiruvidan o'tkazilgandan keyingi bosqichda test sinovlari o'tkaziladi va uning natijalari asosida testlarning xususiyatlari sifatini tashhislash uchun ularning statistik xarakteristikalari aniqlanadi. Testlarini statistikada tanlanma to'plam deb hisoblanadi va u real testlar to'g'risida xulosalar chiqarish imkonini beradi.

Test topshiriqlariga qo'yilgan asosiy talablarning ko'rsatkichlari statistik tavsiflar yordamida aniqlanib, unga qo'yiladigan asosiy talablar – topshiriqning qiyinligi, test ballarining dispersiyasi (o'zgaruvchanligi, farqlanishi), topshiriqning boshqa topshiriqlar bilan, shuningdek, umumiy ballar yig'indisi bilan

korrelyatsiyasidan iborat. Berilgan topshiriqning qiyinlik darajasini aniqlash usullaridan biri uni empirik sinovdan o'tkazib, to'g'ri javoblar salmog'ini aniqlashdan iborat. Test ballarining (yoki to'g'ri javoblarning) dispersiyasi test topshiruvchilarning tayyorgarlik darajasini aniqlashga, bilim darajalari bo'yicha ajratishga imkon beradi.

Test variantlari va test topshiriqlarining asosiy statistik tavsiflari qatoriga o'rta qiymat, histogrammani qurish, moda va mediana kabi ko'rsatkichlarni hisoblash hamda test ballarining umumiy dispersiyasi (standart og'ish) ham kiradi [1-2,15-18]. Test ballarining (yoki to'g'ri javoblarning) o'rta arifmetik qiymati fanlar, oliy ta'lim muassasalari va boshqa muhim belgilar kesimida aniqlanadi. Bu

ko'rsatkich test ballari o'rtasidagi tafovutlarni umumlashtiradi, ularga xos bo'lgan yo'nalishni, qonuniyatni ochib beradi. Test sinovlari natijalari asosida aniqlangan test ballari taqsimoti gistogrammasi quriladi va uning normal taqsimotga yaqinligi baholanadi. Gistogrammaning normal taqsimotga yaqinligi testning sifatini, test sinovlarining ob'ektiv o'tkazilganligini bildiradi. Test ballarining eng ko'p takrorlanadigan qiymati statistikada moda, o'sish

tartibida joylashtirilgan test ballari qatorining o'rtasida joylashgan qiymati esa mediana deyiladi. O'rta arifmetik qiymat, moda va mediana qiymatlari o'zaro teng bo'lganda test ballari taqsimoti simmetrik bo'ladi. Ushbu statistik ko'rsatkichlar biribiridan qanchalik ko'p farq qilsa, ballar taqsimoti normal taqsimotdan shunchalik uzoqda bo'ladi.

1-jadvalda o'tkazilgan test sinovlari natijalarining tavsif statistikasi ma'lumotlari keltirilgan.

### 1-jadval

Natijalarining tavsif statistikasi

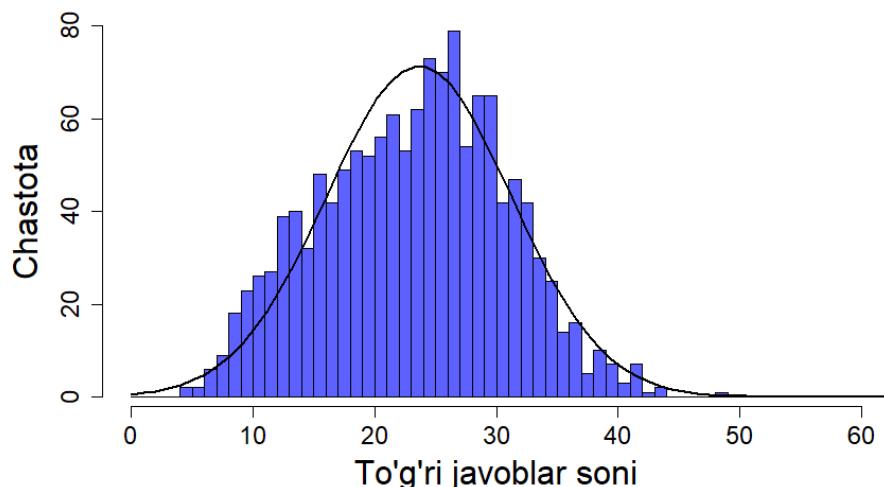
Nº	Test sinovlari	O'rta qiymat	Mediana	Moda	Dispersiya	Kronbax alfa kooeffitsiyenti	O'chashning standart xatoligi
1.	<b>1-test sinovi</b>	23,63	24	27	54,64	0,84	3,04
2.	<b>2-test sinovi</b>	33,28	34	38	56,63	0,84	3,01
3.	<b>3-test sinovi</b>	33,17	35	38	76,39	0,87	3,15

1-jadvalda geografiya fanidan test sinovlari natijalarining tavsif statistikalari, ya'ni test sinovi ballarining o'rta qiymati, medianasi, modasi va dispersiyasi qiymatlari keltirilgan. 1a-, 1b- va 1c- rasmlarda esa ularning gistogrammalari keltirilgan. Gistogrammalardan ko'rinish turibdiki, o'tkazilgan 3 ta test sinovi natijalari bo'yicha test topshiriqlarining individual ballari taqsimoti bir-biriga juda yaqin va normal taqsimotdan juda kam farq

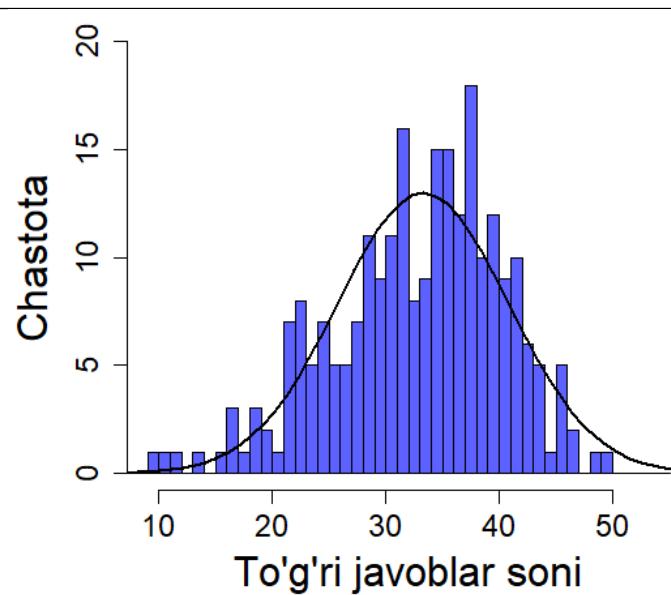
qiladi. Statistik tadqiqot natijalariga ko'ra, geografiya fanidan test variantining ishonchlilik kooeffitsiyenti, ya'ni Kronbax alfa kooeffitsiyenti 1-, 2- va 3- test sinovi natijalari bo'yicha mos ravishda 0,84; 0,84 va 0,87 ga teng ekanligi aniqlandi. Kronbax alfa kooeffitsiyentining 0,8 va undan kattaligi ushbu test sinovlari uchun tanlab olingan test variantlarining ishonchliligi yaxshi darajada ekanligini ko'rsatmoqda [19]. Test topshiriqlarining ichki muvofiqligi har

bitta test topshirig‘iga berilgan to‘g‘ri javoblarning umumiyligi bilan korrelyatsiyasiga, talabgorlar o‘lgan umumiyligi ballarning standart og‘ishiga, har bitta test topshirig‘iga berilgan javoblarining standart og‘ishlari yig‘indisiga hamda test topshiriqlari

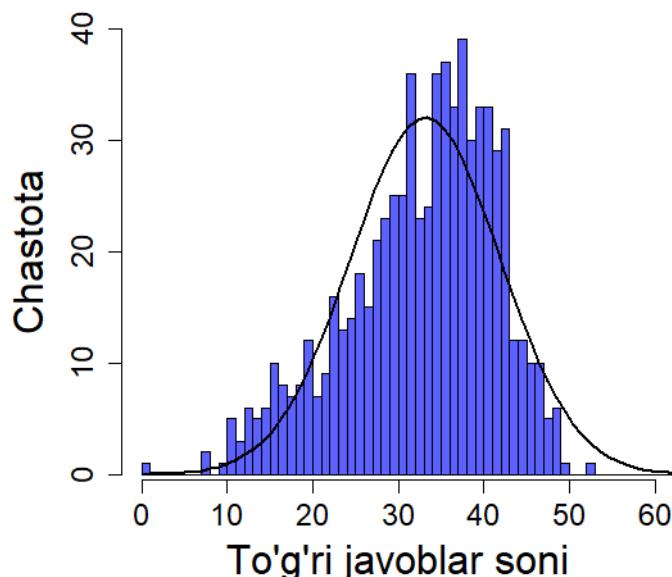
va test topshiruvchilar soniga bog‘liq bo‘ladi. Bundan tashqari test topshiriqlarining ichki muvofiqligi nafaqat test topshiriqlarining sifatiga, balki talabgorlarning tayyorgarlik darajasining past yoki yuqoriligidagi ham bog‘liqdir.



**1a- rasm. Geografiya fanidan milliy sertifikat uchun o’tkazilgan 1-test sinovi natijalarining histogrammasi**



**1b- rasm. Geografiya fanidan milliy sertifikat uchun o’tkazilgan 2-test sinovi natijalarining histogrammasi**



**1c- rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 3-test sinovi natijalarining gistogrammasi**

Klassik test nazariyasi asosida geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalari bo'yicha test topshiriqlarining qiyinlik darajalari aniqlandi. Quyida test topshiriqlari natijalari asosida, test

topshiriqlarining - ID raqami, to'g'ri javob berganlar foizi – Ans (foizda) va test natijalari bo'yicha aniqlangan qiyinlik darajalari V (1-, 2- va 3-qiyinlik darajalari) 2-jadvalda ko'rsatilgan.

### 2-jadval

#### Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalari bo'yicha test topshiriqlarining aniqlangan qiyinlik darajalari

№	1-test sinovi			2-test sinovi			3-test sinovi		
	ID	Ans (foizda)	V	ID	Ans (foizda)	V	ID	Ans (foizda)	V
1.	115548	96,24	1	114169	95,10	1	1073812	92,15	1
2.	115765	85,35	1	107211	91,84	1	107318	91,44	1
3.	115555	84,98	1	107304	91,84	1	113866	87,02	1
4.	115781	80,41	1	113873	89,80	1	107286	86,88	1
5.	115755	78,72	1	107322	88,98	1	112568	86,16	1

6.	115770	75,48	1	112546	87,76	1	107331	85,88	1
7.	115763	69,73	2	112612	85,71	1	114196	83,88	1
8.	115762	69,51	2	107344	84,49	1	112607	82,17	1
9.	115767	69,15	2	112539	84,08	1	114179	80,88	1
10.	115771	68,04	2	113869	83,27	1	112612	79,89	1
11.	115782	67,30	2	107235	80,41	1	107333	77,75	1
12.	115776	66,94	2	113832	79,59	1	107381	77,75	1
13.	115768	66,64	2	107406	79,18	1	107235	77,46	1
14.	1155552	61,27	2	104179	77,14	1	107212	77,32	1
15.	115775	60,97	2	11447433	76,73	1	114115	76,46	1
16.	115783	60,82	2	114099	76,73	1	114193	73,32	2
17.	115772	60,24	2	114126	76,33	1	114191	72,61	2
18.	115754	57,51	2	107391	75,10	1	113848	72,04	2
19.	115759	57,29	2	107331	74,69	2	112616	71,61	2
20.	115780	57,00	2	104183	73,88	2	112592	71,18	2
21.	115756	54,86	2	112562	72,65	2	107190	69,90	2
22.	115758	54,71	2	113847	72,24	2	107230	68,90	2
23.	115777	51,91	2	114474	72,24	2	113851	66,33	2
24.	115550	48,45	2	113861	71,43	2	114125	66,33	2
25.	115786	46,91	2	114116	70,61	2	107339	66,19	2
26.	1157543 5	46,91	2	112580	68,98	2	107206	63,91	2
27.	115773	44,92	2	104190	66,94	2	107246	60,63	2
28.	115764	44,18	2	112592	66,94	2	112547	59,91	2
29.	115761	41,46	2	107292	66,12	2	107270	57,77	2

30.	115757	39,03	2	107204	64,90	2	1141252	57,63	2
31.	115785	37,19	2	107230	64,49	2	1141712	57,49	2
32.	1155502	35,27	2	114091	63,67	2	1141152	56,06	2
33.	115784	35,05	2	1073912	61,63	2	114132	55,21	2
34.	115769	34,54	2	112600	61,22	2	107376	54,35	2
35.	115779	32,47	2	1141162	59,18	2	107239	53,07	2
36.	115760	31,37	2	114190	55,92	2	1140832	52,64	2
37.	115766	28,94	2	113952	54,69	2	113949	51,36	2
38.	115546	27,39	2	114110	54,29	2	10740935	50,64	2
39.	115551	26,22	2	107341	50,61	2	114171	50,36	2
40.	1157543 4	24,45	3	114122	49,80	2	113957	48,07	2
41.	115547	21,72	3	1141222	48,16	2	1073762	47,93	2
42.	115554	20,47	3	1141102	46,94	2	107314	46,79	2
43.	115774	20,32	3	11447434	44,49	2	107402	46,79	2
44.	1155482	19,07	3	1141262	40,41	2	107250	45,36	2
45.	1155522	16,13	3	107311	36,73	2	1073672	43,51	2
46.	115778	14,65	3	113955	35,10	2	112560	41,80	2
47.	115552	12,37	3	107316	33,06	2	111033	40,37	2
48.	1155492	11,41	3	112586	31,84	2	107397	37,52	2
49.	1155542	11,27	3	114097	29,39	2	114083	34,95	2
50.	115549	9,13	3	1140992	24,49	3	107367	34,81	2
51.	1155512	7,88	3	1140972	17,14	3	1074022	34,38	2
52.	1155462	6,77	3	1074062	10,20	3	1141322	33,95	2
53.	1155472	4,79	3	1140912	4,08	3	107409	26,39	2

54.	1155532	4,12	3	1141072	2,86	3	10740934	24,68	3
55.	115553	2,80	3	114107	2,04	3	1073972	6,70	3

1-test sinovi natijalari bo'yicha (2-jadval), 55 ta test topshiriqlaridan 6 tasi (10,91 foiz) 1- qiyinlik darajasidagi test topshiriqlaridan, 33 tasi (60,00 foiz) 2- qiyinlik darajasidagi test topshiriqlaridan va 16 tasi (29,09 foiz) 3- qiyinlik darajasidagi test topshiriqlaridan iborat ekanligi aniqlandi.

1- test sinovida foydalanilgan variantda 1- qiyinlik darajasidagi test topshiriqlari normadan biroz kam, 2-qiyinlik darajasidagi test topshiriqlari normada taqsimlanganligi, 3- qiyinlik darajasidagi test topshiriqlari esa normadan ko'p taqsimlanganligi kuzatildi. ID raqami- 115548 bo'lgan test topshirig'ining qiyinlik darajasi juda past va ID raqamlari- 1155532 va 115553 bo'lgan test topshiriqlarining qiyinlik darajalari juda yuqori ekanligi ko'rish mumkin.

2- test sinovi natijalari bo'yicha esa (2- jadval), 55 ta test topshiriqlaridan 18 tasi (32,73 foiz) 1-qiyinlik darajasidagi test topshiriqlaridan, 31 tasi (56,36 foiz) 2- qiyinlik darajasidagi test topshiriqlaridan va 6 tasi (10,91 foiz) 3- qiyinlik darajasidagi test topshiriqlaridan iborat ekanligi aniqlandi.

2- test sinovida foydalanilgan variantda 1- qiyinlik darajasidagi test topshiriqlari normadan ko'p taqsimlanganligi, 2- qiyinlik darajasidagi test topshiriqlari esa normada taqsimlanganligi va 3-qiyinlik darajasidagi test topshiriqlari esa normadan biroz kam taqsimlanganligi kuzatildi. ID raqamili- 114169, 107211 va 107304 bo'lgan test topshiriqlarining qiyinlik darajasi juda past va ID raqamlari- 1140912, 1141072 va 114107 bo'lgan test topshiriqlarining qiyinlik darajalari esa juda yuqori ekanligi aniqlandi.

3- test sinovi natijalari bo'yicha esa (2- jadval), 55 ta test topshiriqlaridan 15 tasi (27,27 foiz) 1-qiyinlik darajasidagi test topshiriqlaridan, 38 tasi (69,10 foiz) 2- qiyinlik darajasidagi test topshiriqlaridan va 2 tasi (3,63 foiz) 3-qiyinlik darajasidagi test topshiriqlaridan iborat ekanligi aniqlandi.

3- test sinovida foydalanilgan variantda 1- va 2- qiyinlik darajasidagi test topshiriqlari normadan biroz ko'p taqsimlanganligi va 3- qiyinlik darajasidagi test topshiriqlari normadan juda kam taqsimlanganligi kuzatildi. ID raqamlari- 1073812 va 107318 bo'lgan test topshiriqlarining

qiyinlik darajasi juda past va ID raqami- 1073972 bo'lgan test topshirig'ining qiyinlik darajasi esa juda yuqori ekanligi aniqlandi.

Klassik test nazariyasi bo'yicha test topshiriqlarining normal taqsimotni ta'minlash uchun, 1- va 3-darajali test topshiriqlari sonini test variantidagi test topshiriqlari sonining 16-25 (9-14 ta) foizi, 2- darajali test topshiriqlari sonini esa 50-68 (27-37 ta) foiz qilib olish maqsadga muvofiq bo'ladi.

Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovida test topshiriqlarining ichki muvofiqligi har bitta test topshirig'iga berilgan to'g'ri javoblarining umumiyligi bilan korrelyatsiyasiga, talabgorlar olgan umumiyligi ballarning standart og'ishiga, har bitta test topshirig'iga berilgan javoblarining standart og'ishlari yig'indisiga hamda test topshiriqlari va test topshiruvchilar soniga bog'liq bo'ladi. Bundan tashqari test topshiriqlarining

ichki muvofiqligi nafaqat test topshiriqlarining sifatiga, balki talabgorlarning tayyorgarlik darajasining past yoki yuqoriligidagi ham bog'liqdir.

Har bitta test topshirig'iga berilgan javoblarining umumiyligi test ball bilan korrelyatsiyasi shu test topshirig'ining qobililiyatlarini qanchalik yaxshi ajaratishini bildiradi.

Umuman olganda, umumiyligi ball bilan korrelyatsiya koeffitsiyenti qiymati 2- qiyinlik darajasidagi test topshiriqlari uchun 0,5 va undan katta bo'lsa, 1- va 3- qiyinlik darajasidagi test topshiriqlari uchun esa 0,25 va undan katta bo'lsa valid hisoblanadi. Umumiyligi ball bilan korrelyatsiya koeffitsiyenti qiymati manfiy bo'lgan test topshiriqlari esa variantdan chiqariladi. Aks holda bilim darajalari past bo'lgan talabgorlar g'olib bo'lib, bilim darajalari yuqori bo'lgan talabgorlar test topshiriqlarini yechishda noto'g'ri javobni tanlaydilar yoki ularni o'tkazib yuboradilar.

### **3-jadval**

#### **Individual test topshiriqlariga berilgan javoblarining umumiyligi bilan korrelyatsiyalari**

№	1-test sivoni		2-test sivoni		3-test sivoni	
	ID	UBBKK	ID	UBBKK	ID	UBBKK
1.	<b>115548</b>	<b>0,087</b>	<b>114169</b>	<b>0,225</b>	1073812	0,311
2.	115765	0,457	107211	0,352	107318	0,295
3.	115555	0,331	<b>107304</b>	<b>0,235</b>	113866	0,334

4.	115781	0,456	<b>113873</b>	<b>0,242</b>	107286	0,385
5.	115755	0,444	107322	0,432	112568	0,313
6.	115770	0,285	112546	0,356	<b>107331</b>	<b>0,233</b>
7.	115763	0,407	112612	0,358	114196	0,447
8.	115762	0,436	107344	0,290	112607	0,349
9.	115767	0,500	112539	0,359	114179	0,363
10.	115771	0,352	<b>113869</b>	<b>0,190</b>	112612	0,496
11.	115782	0,369	107235	0,314	107333	0,426
12.	<b>115776</b>	<b>0,246</b>	113832	0,265	107381	0,516
13.	115768	0,433	107406	0,508	107235	0,498
14.	1155552	0,408	104179	0,458	107212	0,444
15.	115775	0,384	11447433	0,413	114115	0,416
16.	115783	0,318	114099	0,322	114193	0,335
17.	115772	0,353	<b>114126</b>	<b>0,210</b>	114191	0,447
18.	115754	0,431	107391	0,398	113848	0,440
19.	115759	0,390	107331	0,309	112616	0,279
20.	115780	0,317	104183	0,412	112592	0,402
21.	115756	0,298	112562	0,314	107190	0,439
22.	<b>115758</b>	<b>0,144</b>	113847	0,265	107230	0,395
23.	115777	0,422	114474	0,457	113851	0,343
24.	115550	0,404	113861	0,471	114125	0,390
25.	115786	0,373	114116	0,322	107339	0,413
26.	11575435	0,433	112580	0,265	107206	0,299
27.	115773	0,341	104190	0,287	107246	0,250

28.	115764	0,363	112592	0,434	112547	0,284
29.	115761	0,429	107292	0,528	107270	0,335
30.	115757	0,293	107204	0,323	1141252	0,295
31.	115785	0,343	107230	0,336	1141712	0,452
32.	1155502	0,522	114091	0,423	1141152	0,407
33.	<b>115784</b>	<b>0,223</b>	1073912	0,434	114132	0,427
34.	<b>115769</b>	<b>0,203</b>	112600	0,291	107376	0,475
35.	<b>115779</b>	<b>0,148</b>	1141162	0,433	107239	0,259
36.	<b>115760</b>	<b>0,165</b>	<b>114190</b>	<b>0,192</b>	1140832	0,334
37.	115766	0,313	113952	0,444	113949	0,334
38.	115546	0,278	114110	0,414	10740935	0,289
39.	115551	0,351	<b>107341</b>	<b>0,194</b>	114171	0,404
40.	<b>11575434</b>	<b>0,181</b>	114122	0,391	113957	0,320
41.	115547	0,351	1141222	0,429	1073762	0,440
42.	115554	0,398	1141102	0,295	<b>107314</b>	<b>0,230</b>
43.	<b>115774</b>	<b>0,100</b>	<b>1144743</b> 4	<b>0,060</b>	107402	0,541
44.	1155482	0,325	1141262	0,344	<b>107250</b>	<b>0,237</b>
45.	<b>1155522</b>	<b>0,181</b>	107311	0,330	1073672	0,351
46.	<b>115778</b>	<b>0,096</b>	113955	0,319	<b>112560</b>	<b>0,073</b>
47.	115552	0,327	<b>107316</b>	<b>0,204</b>	111033	0,376
48.	1155492	0,317	<b>112586</b>	<b>0,229</b>	107397	0,444
49.	1155542	0,356	114097	0,387	114083	0,357
50.	115549	0,287	<b>1140992</b>	<b>0,182</b>	107367	0,427
51.	1155512	0,293	1140972	0,338	1074022	0,442

52.	<b>1155462</b>	<b>0,221</b>	<b>1074062</b>	<b>0,220</b>	1141322	0,251
53.	<b>1155472</b>	<b>0,230</b>	<b>1140912</b>	<b>0,192</b>	<b>107409</b>	<b>0,157</b>
54.	1155532	0,284	<b>1141072</b>	<b>0,143</b>	<b>10740934</b>	<b>0,118</b>
55.	<b>115553</b>	<b>0,225</b>	<b>114107</b>	<b>0,156</b>	<b>1073972</b>	<b>0,185</b>

3- jadvalda 1-, 2- va 3- test sinovi natijalari tahlili asosida olingan test topshiriqlarining umumiy ball bilan korrelyatsiya koeffitsiyenti (UBBKK) qiymatlari qiyinlik darajalari ortib borishi tartibida keltirilgan.

Statistik tadqiqotlar natijalariga ko'ra 1- test sinovida foydalanilgan test topshiriqlarining 14 tasini (3-jadvalning 1- test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 115548, 115776, 115758, 115784, 115769, 115779, 115760, 11575434, 115774, 1155522, 115778, 1155462, 1155472 va 115553) va 2- test sinovida foydalanilgan test topshiriqlarining 15 tasini (3-jadvalning 2- test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 114169, 107304, 113873, 113869, 114126, 114190, 107341, 11447434,

107316, 112586, 1140992, 1074062, 1140912, 1141072 va 114107) hamda 3- test sinovida foydalanilgan test topshiriqlarining 7 tasini (3-jadvalning 3- test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 107331, 107314, 107250, 112560, 107409, 10740934 va 1073972) umumiy ball bilan korrelyatsiya koeffitsiyenti qiymati 0,25 dan kichikligi aniqlandi. 3- jadvaldan bu test topshiriqlarining aksariyatining qiyinlik darjasasi yuqori yoki past ekanligini ko'rish mumkin.

1- test sinovidagi ID raqamlari - 115784, 115769, 115779, 115760 bo'lgan test topshiriqlarinig qiyinlik darjasasi taqsimotida o'rtaga yaqinliginidan unung umumiy ball bilan korrelyatsiyasi ancha kichikligini hisobga olish lozim.

### III. Test sinovlari natijalarini Rash modeli asosida tahlili

Klassik test nazariyasining ham, zamonaviy test nazariyasining ham asosiy maqsadi test va so'rovnomalar yordamida olingan natijalarni tahlil qilib, shaxslarning yashirin xususiyati (latent trait) bo'yicha ma'lum bir

shkaladagi o'rnini aniqlashdir [20]. Mazkur maqolaning bu qismida zamonaviy test nazariyasining modellaridan biri bo'lgan Rash modeli asosida tahlil natijalarini keltiramiz.

Test topshiriqlarini sifatini Rash modeli asosida matematik-statistik tadqiqoti hozirda keng tarqalgan usullardan biri bo'lib, u dunyoning qator yetakchi mamlakatlari ta'lif tizimida samarali foydalanib kelinmoqda.

Rash modeli turli xildagi so'rovnama va testlar yordamida ob'yektiv o'lchashlarni amalga oshirish tomon qilingan harakatlar tufayli Daniyalik olim Jorj Rash tomonidan yaratilgan. Bir o'lchovlilikni ta'minlash mushkul bo'lishiga qaramasdan, uni ta'minlash uchun oldindan tayyorgarlik ishlarinini amalga oshirish va bu ishlar qanchalik amalga oshirilganini empirik usullar bilan tekshirish imkonи mavjud. Chiziqli mavhum shkalaga esa Rash modelida logit birliklari orqali o'tiladi. Rash modelining muhim xususiyati u shunchaki ma'lumotlarni tahlil qilish uchun statistik usul emas, balki u o'lchovni nimaligini, ta'lif tizimida o'lchovlarni qanday sifatili amalga oshirish imkoniyatini beradi [8].

Rash modelida [3-4] yashirin qobiliyat va elementlar qiyinligi kabi parametrlarini aniqlash muhim o'rinn tutadi. Bu ikkita kattalikdan birinchisi o'zgaruvchi sifatida, ikkinchisi esa parametr sifatida qaralishi mumkin. Test natijalarini tahlil qilishda elementlar qiyinlik darajasini parametr sifatida qarash qulay, chunki qobiliyat (bilim) bu modelda

elementlarga berilgan javoblarga qarab belgilanadi.

Rash modeliga ko'ra, dixotomik elementlarga individual javoblar shaxsning qobiliyat darajasi va element qiyinligi bilan aniqlanadi. Ma'lum bir qobiliyatga ega bo'lgan shaxsning ma'lum bir qiyinlikdagi elementga to'g'ri javob berish ehtimolligini aniqlaydi. Bu quyidagi matematik formula orqali ifodalanadi:

$$P(X_{is}=1 \vee \theta_s, b_i) = \frac{e^{\theta_s - b_i}}{1+e^{\theta_s - b_i}}$$

Bu yerda,  $X_{is}=1$   $s-$  talabgorning  $i$ -elementga to'g'ri javob berish ehtimoli,  $\theta_s$ - qobiliyat o'zgaruvchisi,  $b_i$ - topshiriq qiyinlik darajasi,  $e$ -natural logarifm asosi ( $e=2,7182818\dots$ ).

Geografiya fanidan test sinovlari natijalarini tahlili Rash modeli bo'yicha tahlilini maxsus dastur asosida amalga oshirish uchun ishlab chiqilgan turli xil dasturiy paketlardan foydalanamiz. Qiyinlik darajasi  $b$  ni aniqlashda biz dexter dasturiy paketidan foydalanamiz [5], chunki Rash modeli uchun bu dasturiy paket yordamida tajribaning (test natijalari) modelga qanchalik mosligini hisoblash mumkin bo'ladi.

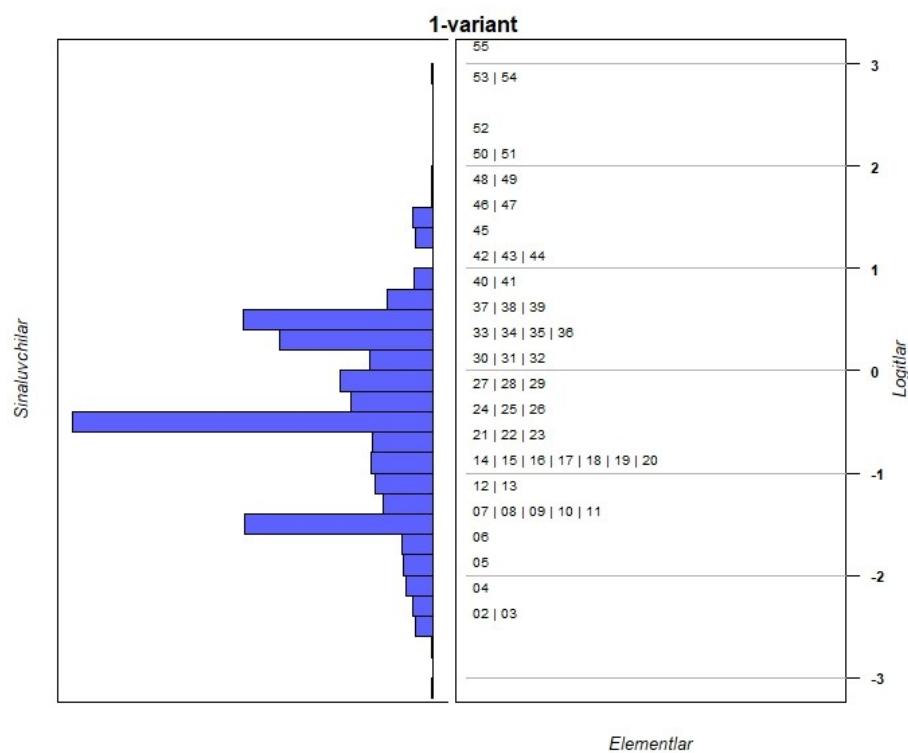
Rash modeli asosida aniqlangan qiyinlik darajalarini talabgorlar qobiliyatlariga qanchalik mosligini Rayt xaritasi yordamida tahlil qilish mumkin.

Rayt xaritasi – test topshiriqlarining qiyinlik darajalari va talabgorlarning qobiliyat darajalarini o'zaro mos kelishini aniqlovchi diagrammadir [21]. Rayt xaritasining chizmasini olishda [22] dasturiy paketidan foydalanildi. 2-, 3- va 4-rasmlarda mos ravishda geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3- test sinovi natijalari asosida chizilgan Rayt xaritalari keltirilgan.

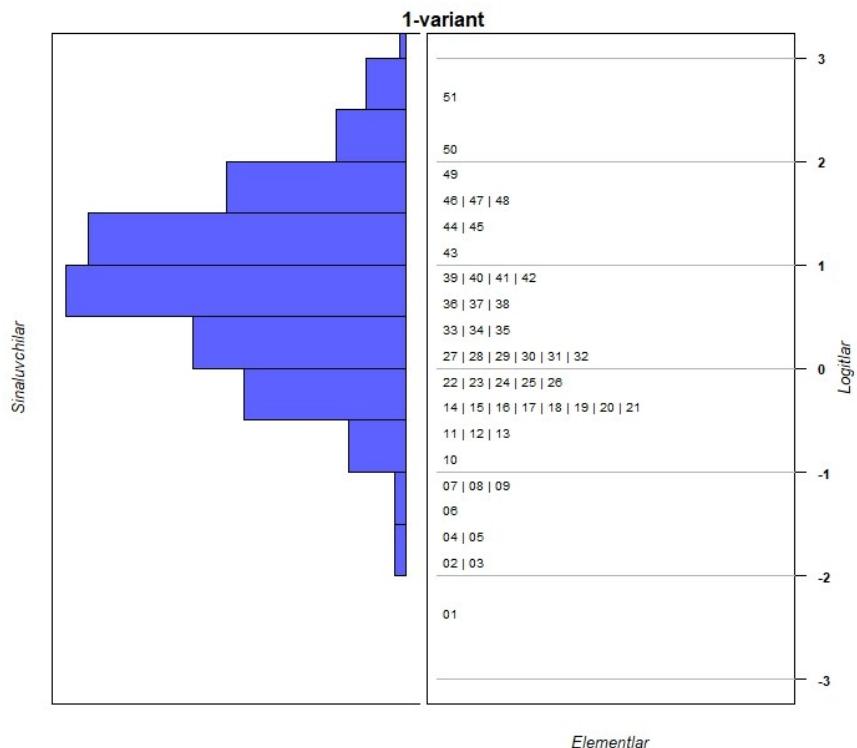
2-rasmdan qobiliyat darajalari –3,05 va 2,83 logit birligi orasida, test topshiriqlari qiyinlik darajalari esa (–3,95:3,36) oraliqda va 3-rasmdan qobiliyat darajalari –1,62 va 3,58 logit

birligi orasida, test topshiriqlari qiyinlik darajalari esa (–2,39:4,97) oraliqda hamda 4-rasmdan qobiliyat darajalari –4,34 va 4,16 logit birligi orasida, test topshiriqlari qiyinlik darajalari esa (–1,93:3,63) oraliqda taqsimlanganligi kuzatildi.

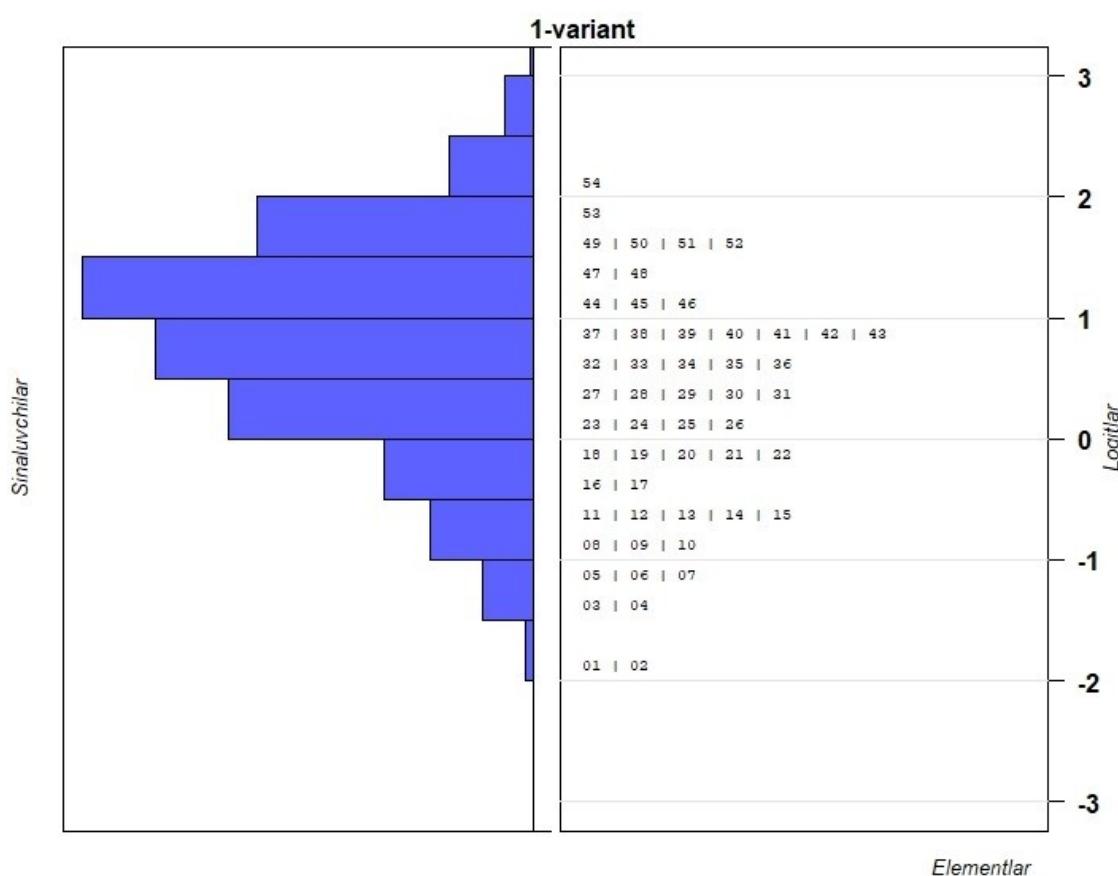
Qiyinlik darajasi bo'yicha 2-rasmdagi 55- o'rinda turgan, 3-rasmdagi 52-55- o'rindarda turgan va 4- rasmdagi 55- o'rinda turgan test topshirilari - test topshiriqlarining qiyinlik darajalari bo'yicha 3 logit birligidan tashqarida ekanligi ko'rini turibdi.



**2-rasm. 1-test sinovi natijalari asosida aniqlangan qobiliyat va qiyinlik darajalarining mosligi**



**3-rasm. 2-test sinovi natijalari asosida aniqlangan qobiliyat va qiyinlik darajalarining mosligi**



**4-rasm. 3- test sinovi natijalari asosida aniqlangan qobiliyat va**

## qiyinlik darajalarining mosligi

Demak, -3 logit birligidan kichik va 3 logit birligidan katta qiyinlik darajasiga ega bo'lgan test topshiriqlari, mos ravishda, juda qiyin yoki juda oson test topshiriqlaridir.

Qiyinlik darjasini bo'yicha (-3:3) logit birligi oralig'idan tashqarida joylashgan (yuqorida keltirilgan) test topshiriqlaridan kam miqdorda ma'lumot olinishi sababli bunday test topshiriqlarining o'rniga (-3:3) logit birligi oralig'iga to'g'ri keladigan qiyinlikdagi test topshiriqlaridan qo'yish maqsadga muvofiq bo'ladi. Biroq, bunday test topshiriqlari agarda talabgorlar orasida shu test topshiriqlariga mos qobiliyatli talabgorlar bo'lsa, shunday test topshiriqlarining mavjudligi shu qobiliyatli talabgorlar to'g'risida ma'lumot beradi. Aks holda qiyinlik darjasini juda past va juda yuqori bo'lgan test topshiriqlarini o'rniga (-3:3) logit birligi atrofidagi test topshiriqlaridan kiritish, yuqori va past qobiliyat darajalaridan olinadigan ma'lumot miqdori orasidagi tafovutni yanada kamaytirish imkonini beradi.

2- rasmdan 1-test sinovi uchun tanlab olingan variantda test topshiriqlari talabgorlarning qobiliyatlariga mos ekanligi ko'rindi.

3- rasmdan qiyinlik darajalarini bo'yicha 52-55-o'rnlarda turgan test topshiriqlari 3 logit birligidan

tashqarida bo'lsada, ushbu test topshiriqlarini yecha oladigan qobiliyatli talabgorlar ham mavjud ekanligi ko'rindi.

4- rasmda esa bunday test topshiriqlari 1 dona bo'lib, bu qiyinlik darjasini bo'yicha 55- o'rinda turgan test topshirig'idir. Bunda ham ushbu topshiriqni yecha oladigan yuqori qobiliyatli talabgorlarning mavjudligini ko'rish mumkin.

Quyida test topshiriqlarining Rash modeli bilan aniqlangan qiyinlik darajalarini ko'rib chiqamiz. 4-jadvalda geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalarining Rash modeli bilan aniqlangan qiyinlik darajalari keltirilgan.

4-jadvaldagagi 1- test sinovi natijalari bo'yicha aniqlangan qiyinlik darajalariga e'tibor bersak, 115553 ID raqamli test topshirig'i eng qiyin, 115548 ID raqamli test topshirig'i esa eng oson ekanligi, 2- test sinovi natijalari bo'yicha aniqlangan qiyinlik darajalarini ko'radigan bo'lsak, 114107 ID raqamli test topshirig'i eng qiyin, 114169 ID raqamli test topshirig'i esa eng oson ekanligi va 3-test sinovi natijalari bo'yicha aniqlangan qiyinlik darajalarini ko'radigan bo'lsak, 1073972 ID raqamli test topshirig'i eng qiyin, 1073812 ID raqamli test topshirig'i

esa eng oson ekanligi ko‘rinadi. Bu esa 2-, 3- va 4- rasmlardagi Rayt xaritasida ham o‘z aksini topgan.

#### **4- jadval**

#### **Rash modeli bilan aniqlangan qiyinlik darajalari**

<b>Nº</b>	<b>1- test sinovi</b>		<b>2- test sinovi</b>		<b>3- test sinovi</b>	
	<b>ID</b>	<b>b</b>	<b>ID</b>	<b>b</b>	<b>ID</b>	<b>b</b>
1.	115548	-3,96	114169	-2,39	1073812	-1,93
2.	115765	-2,41	107211	-1,82	107318	-1,83
3.	115555	-2,37	107304	-1,82	113866	-1,32
4.	115781	-2,03	107322	-1,74	107286	-1,31
5.	115755	-1,91	113873	-1,56	112568	-1,24
6.	115770	-1,71	112546	-1,34	114196	-1,04
7.	115763	-1,38	107344	-1,19	107331	-1,00
8.	115762	-1,37	112612	-1,15	112607	-0,91
9.	115767	-1,35	112539	-1,01	112612	-0,88
10.	115771	-1,30	113869	-0,94	114179	-0,81
11.	115782	-1,26	107235	-0,73	107235	-0,66
12.	115776	-1,24	113832	-0,68	107381	-0,59
13.	115768	-1,22	107406	-0,65	107333	-0,59
14.	1155552	-0,96	1144743 3	-0,49	107212	-0,57
15.	115775	-0,95	114099	-0,49	114115	-0,51
16.	115783	-0,94	114126	-0,47	114193	-0,32
17.	115772	-0,91	104179	-0,44	114191	-0,28
18.	115754	-0,78	107391	-0,39	113848	-0,25
19.	115759	-0,77	107331	-0,37	112616	-0,22

20.	115780	-0,76	104183	-0,30	112592	-0,18
21.	115756	-0,66	112562	-0,25	107190	-0,13
22.	115758	-0,66	114474	-0,23	107230	-0,05
23.	115777	-0,53	113847	-0,23	113851	0,06
24.	115550	-0,37	113861	-0,18	114125	0,06
25.	115786	-0,30	114116	-0,14	107339	0,07
26.	1157543 5	-0,30	112580	-0,05	107206	0,18
27.	115773	-0,21	104190	0,05	107246	0,34
28.	115764	-0,18	112592	0,05	112547	0,37
29.	115761	-0,05	107204	0,16	107270	0,48
30.	115757	0,06	107230	0,18	1141252	0,48
31.	115785	0,15	114091	0,22	1141712	0,49
32.	1155502	0,24	107292	0,22	1141152	0,56
33.	115784	0,25	1073912	0,31	114132	0,59
34.	115769	0,28	112600	0,33	107376	0,63
35.	115779	0,38	1141162	0,43	107239	0,69
36.	115760	0,44	114190	0,58	1140832	0,71
37.	115766	0,56	113952	0,64	113949	0,77
38.	115546	0,65	114110	0,65	1074093 5	0,80
39.	115551	0,71	107341	0,82	114171	0,82
40.	1157543 4	0,82	114122	0,86	113957	0,92
41.	115547	0,99	1141222	0,93	1073762	0,93
42.	115554	1,07	1141102	0,99	107402	0,98

43.	115774	1,08	1144743 4	1,10	107314	0,98
44.	1155482	1,16	1141262	1,28	107250	1,04
45.	1155522	1,38	107311	1,46	1073672	1,13
46.	115778	1,50	113955	1,54	112560	1,21
47.	115552	1,71	107316	1,64	111033	1,28
48.	1155492	1,81	112586	1,70	107397	1,41
49.	1155542	1,82	114097	1,83	114083	1,53
50.	115549	2,07	1140992	2,10	107367	1,54
51.	1155512	2,24	1140972	2,59	1074022	1,56
52.	1155462	2,41	1074062	3,23	1141322	1,58
53.	1155472	2,79	1140912	4,25	107409	1,98
54.	1155532	2,95	1141072	4,62	1074093 4	2,08
55.	115553	3,36	114107	4,97	1073972	3,69

Test topshiriqlarining Rash modeli bilan mosligi ham muhim ahamiyatga kasb etadi. Har xil qobiliyat darajalarini aniqlash uchun kalibrovkalangan test topshiriqlari bazasini yaratishda test topshiriqlarining Rash modeli bilan moslik statistikalarini o'rganib chiqish kerak.

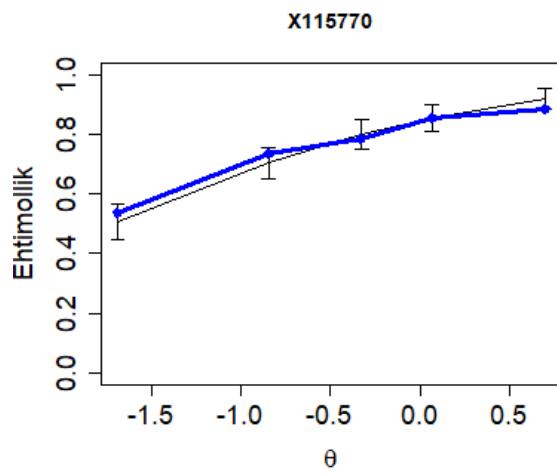
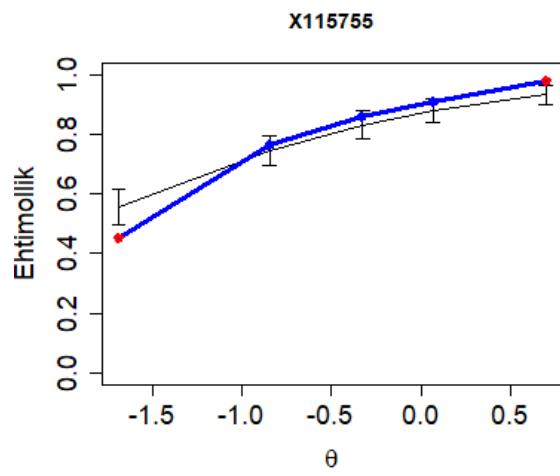
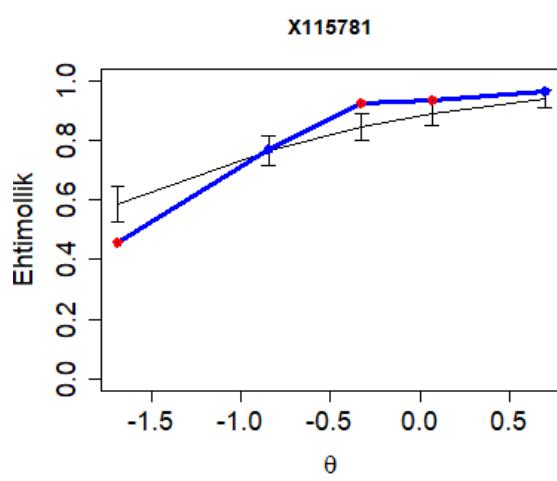
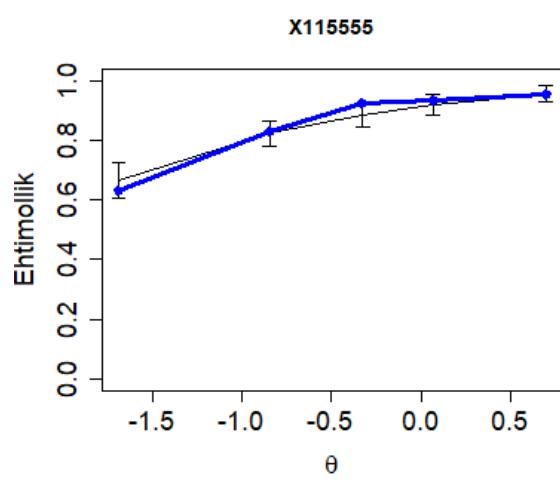
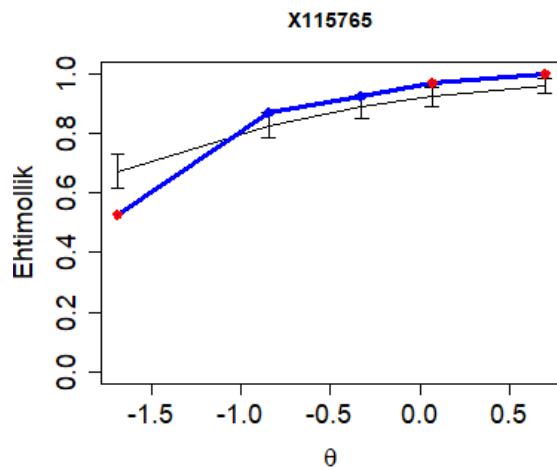
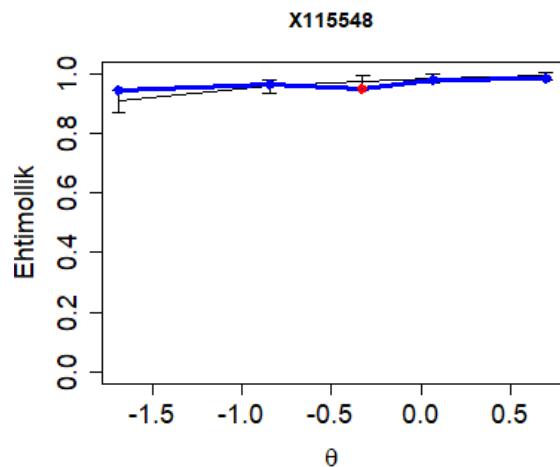
5a-, 5b- va 5c- rasmlarda mos ravishda geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3-test sinovi natijalarining Rash modeli bilan mosligi – talabgorlar 5 ta qobiliyat guruhiga bo'lingan va qalin

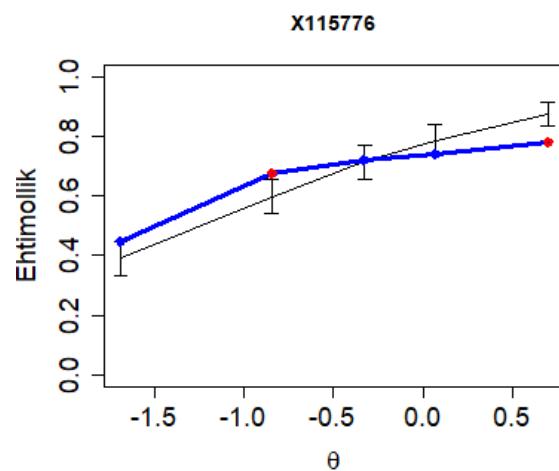
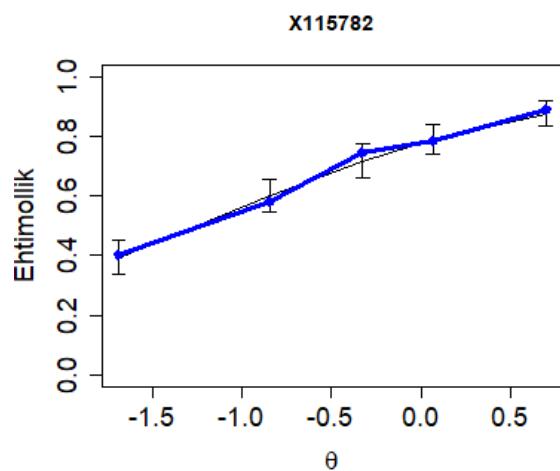
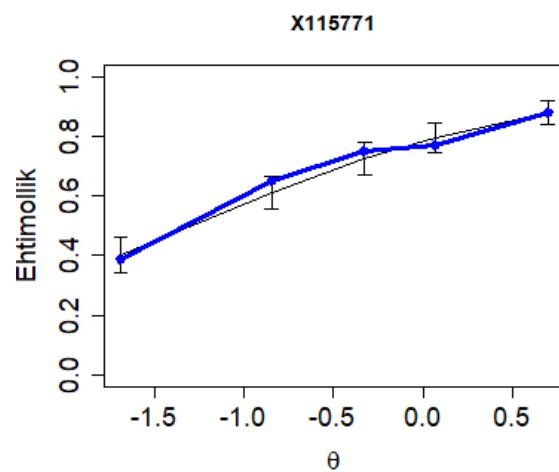
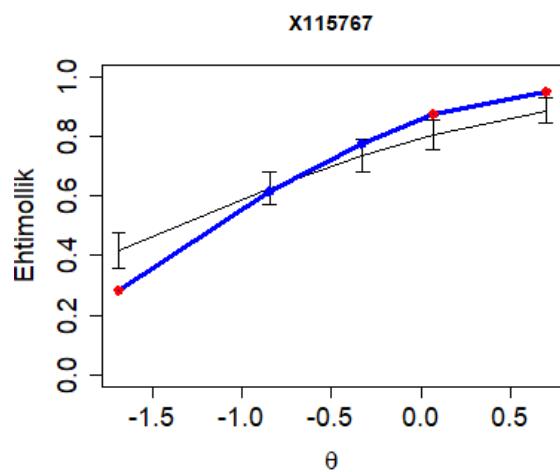
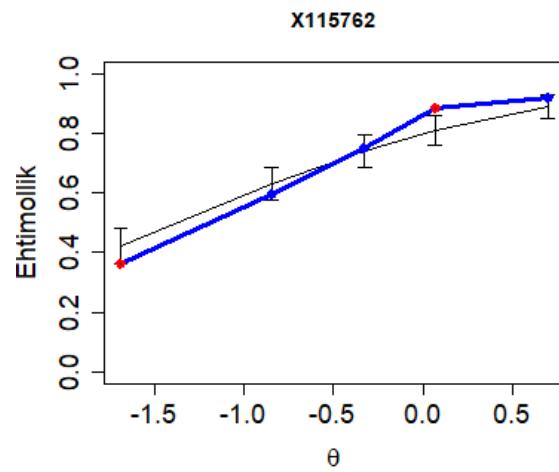
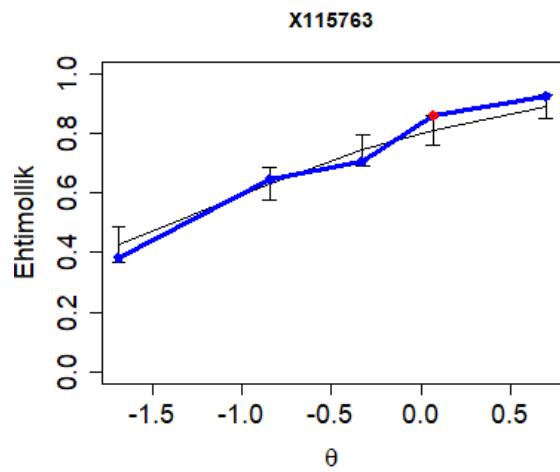
ko'k chiziqlar bilan test sinovlaridan olingan natijalar, ingichka qora chiziq bilan kutiladigan qiymatlar esa vertikal standart xatolik chiziqlari bilan birga ko'rsatilgan. Standart xatolik chegarasidan chiqib ketgan nuqtalar qizil doirachalar bilan belgilangan. Rasmlarning yuqorisidagi raqamlar test topshiriqlarining ID raqamini bildiradi.

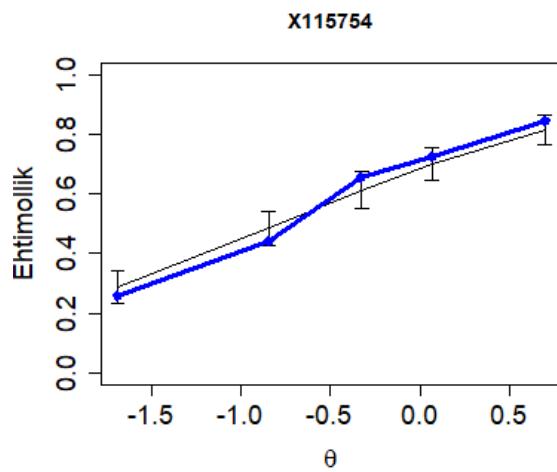
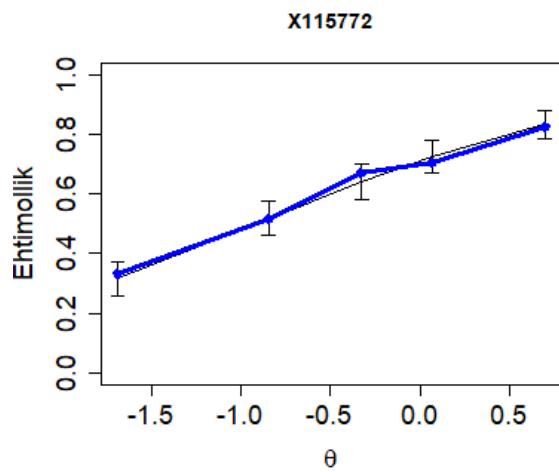
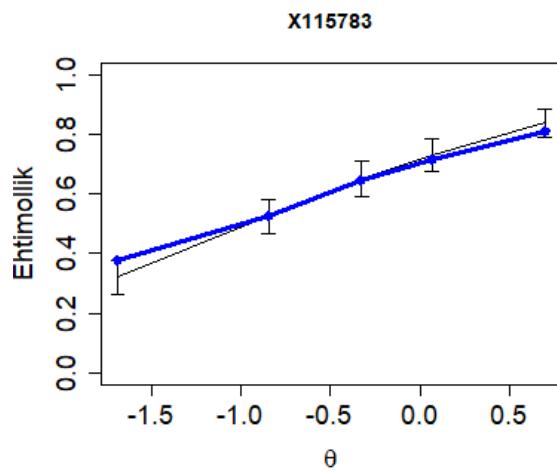
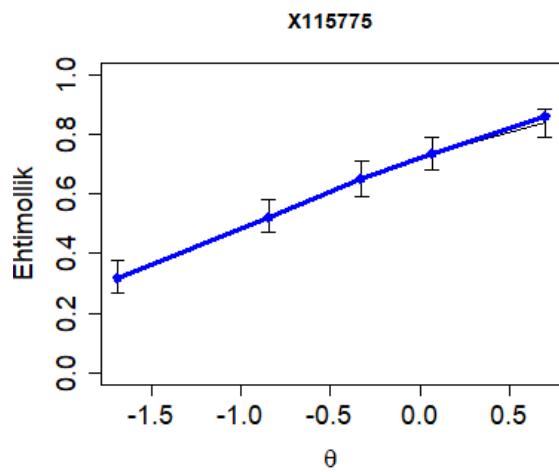
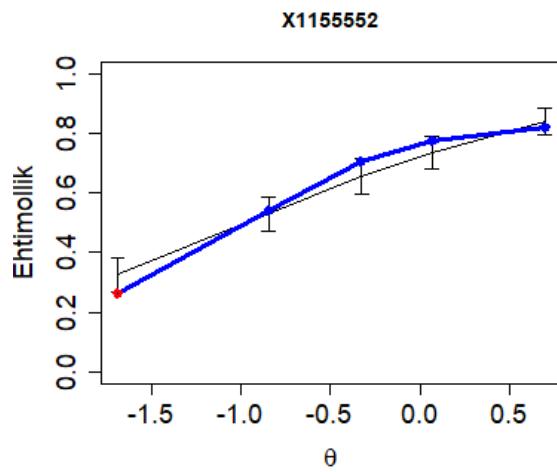
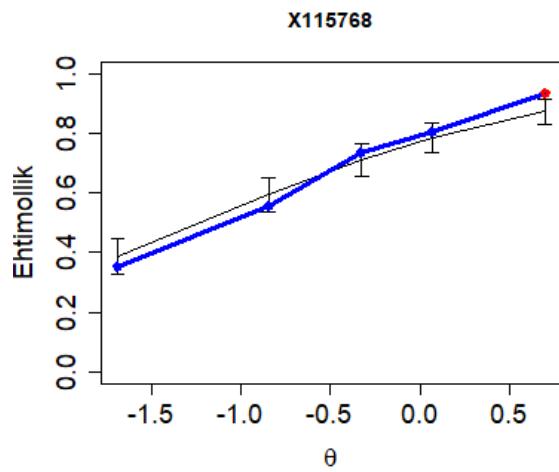
Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovi tahlili natijalariga ko'ra ID raqamlari – 101155, 101166, 101412 va 101590 bo'lgan test topshiriqlarining Rash modeli bilan

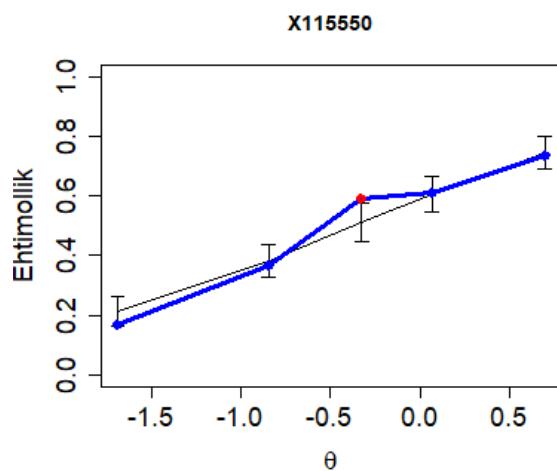
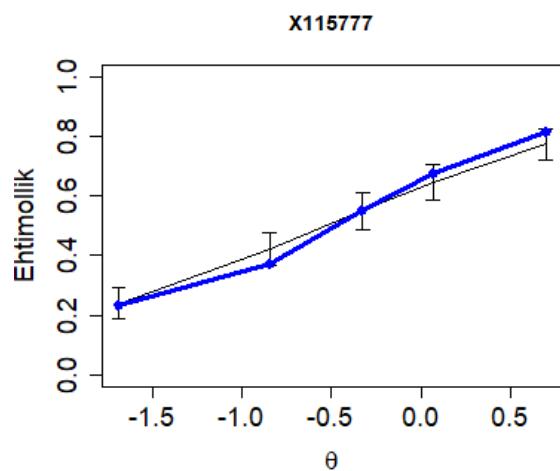
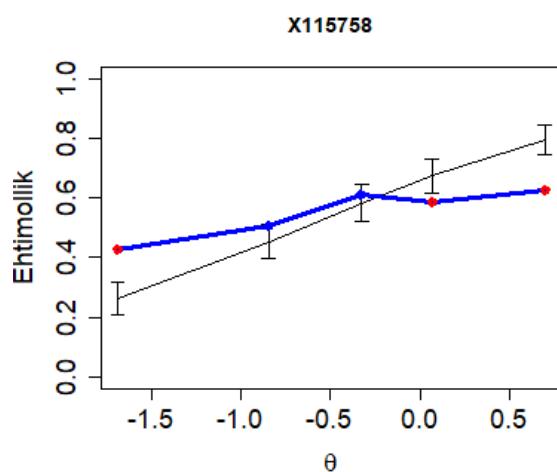
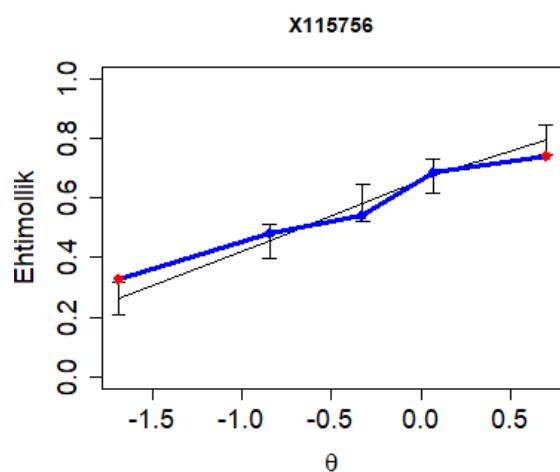
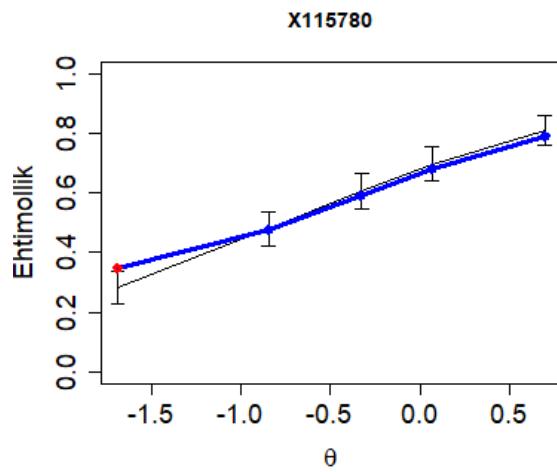
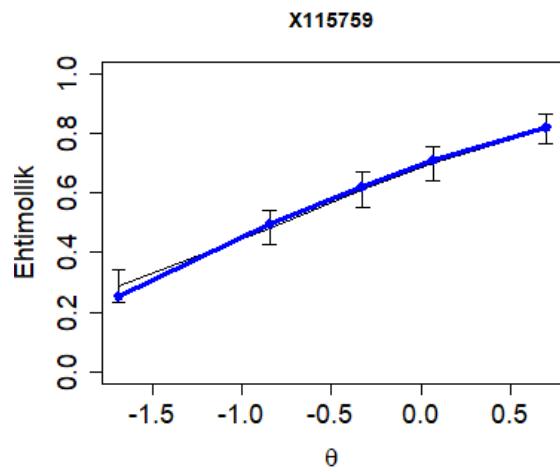
moslik darajasi yaxshi emasligini ya'ni ajratilgan qobiliyat guruhlarining

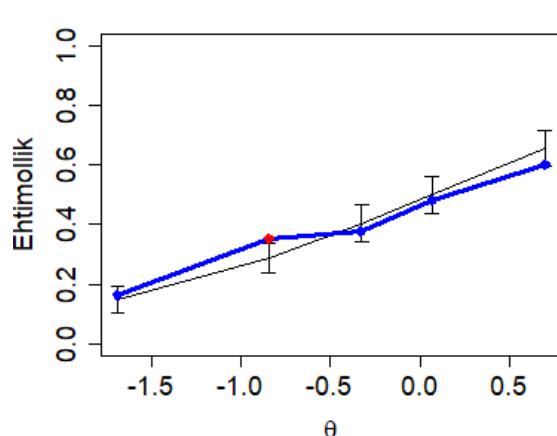
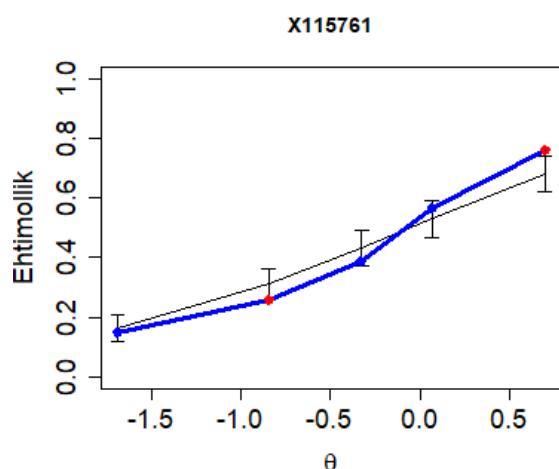
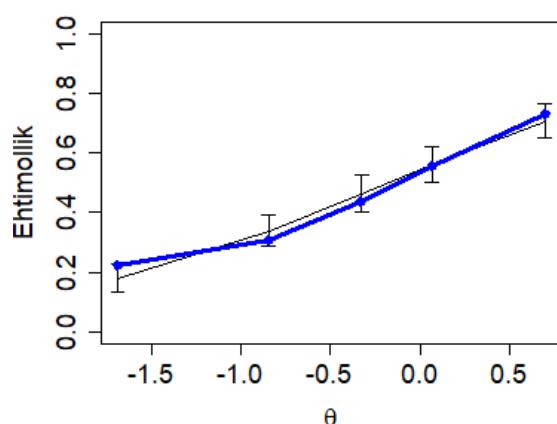
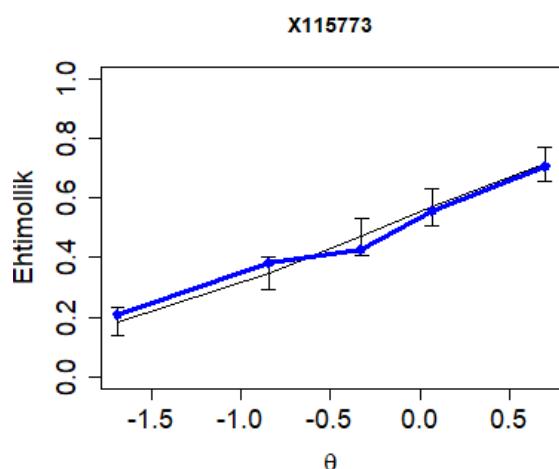
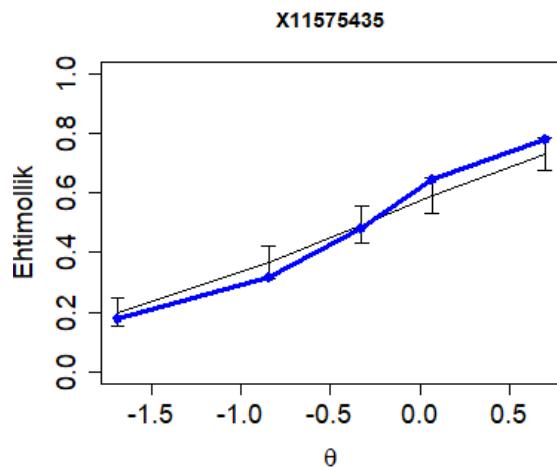
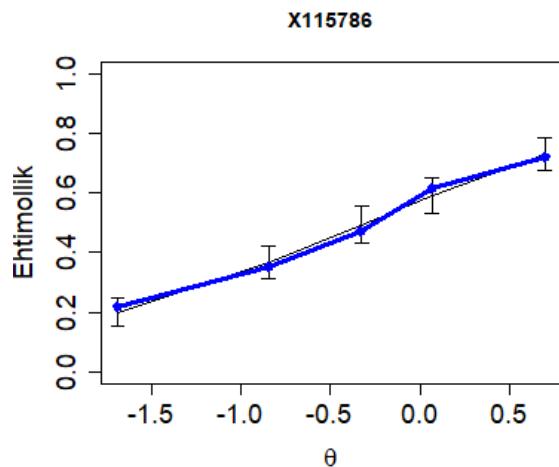
barchasi bilan mos tushmaganligini bildiradi (5a-rasm).

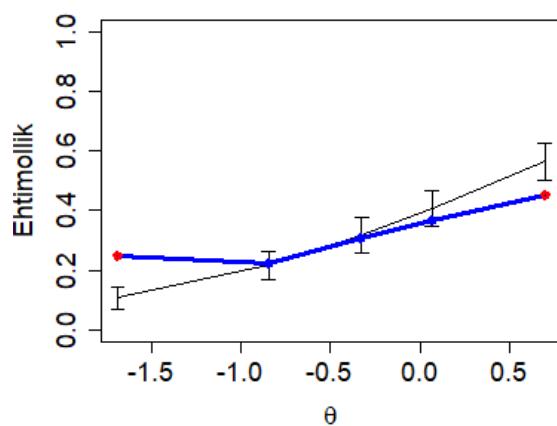
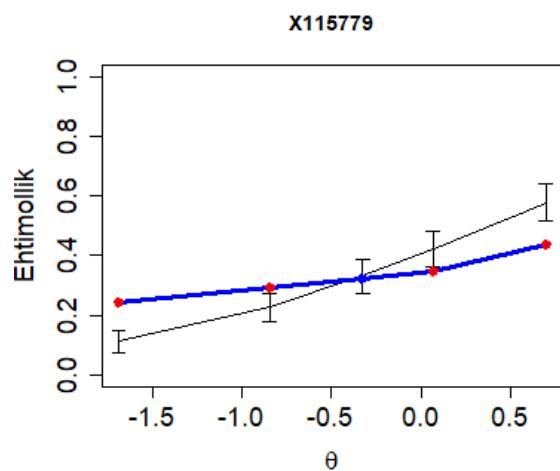
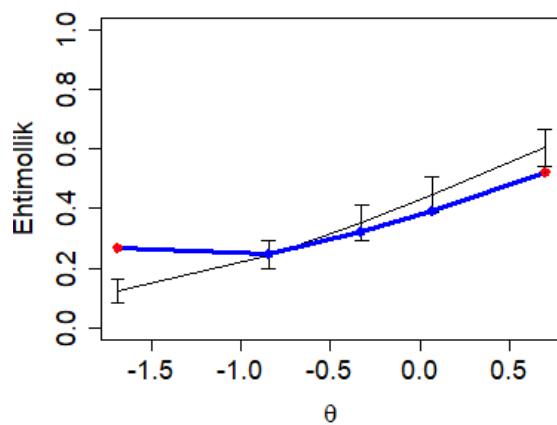
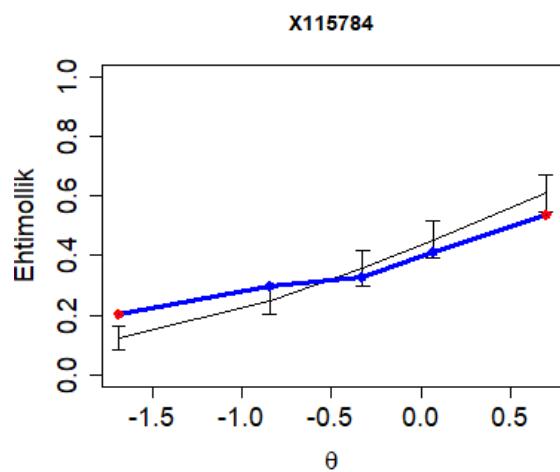
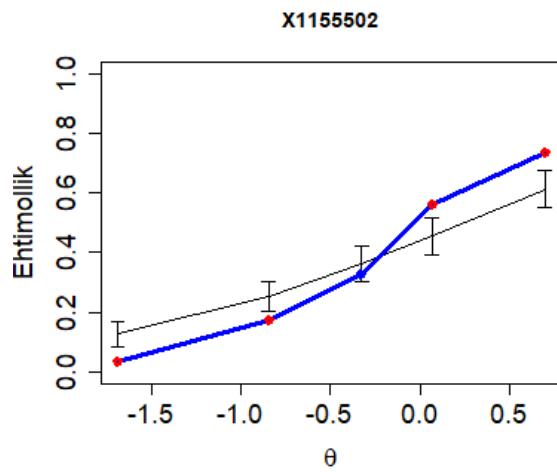
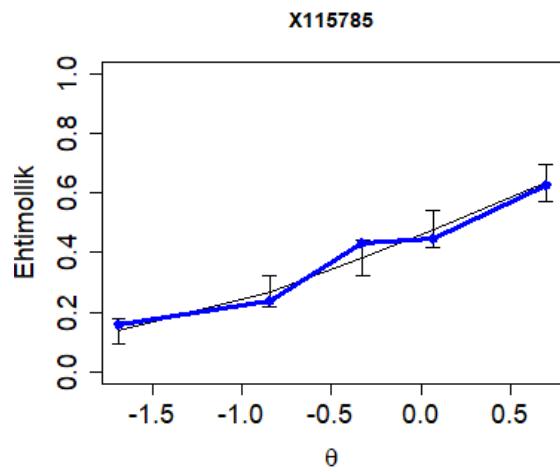


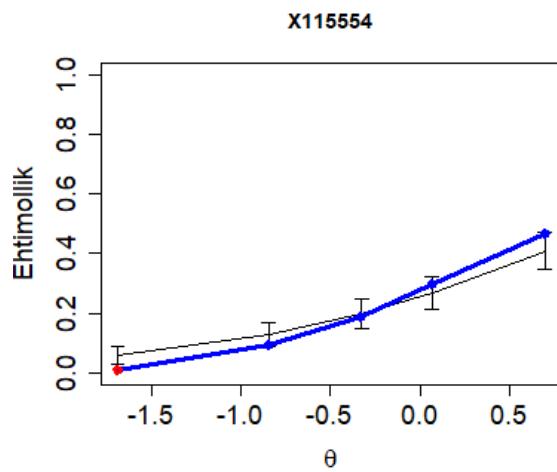
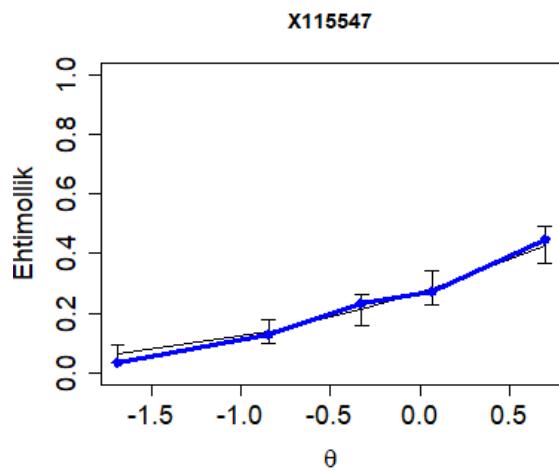
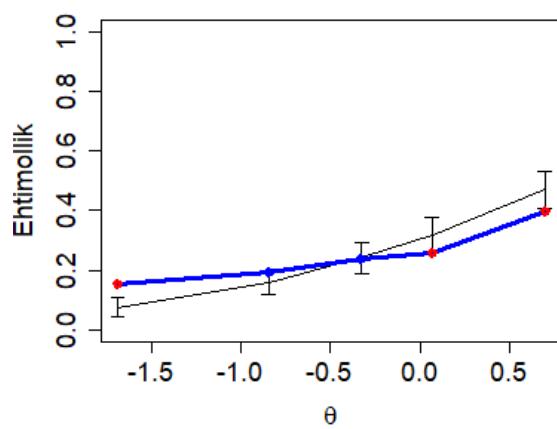
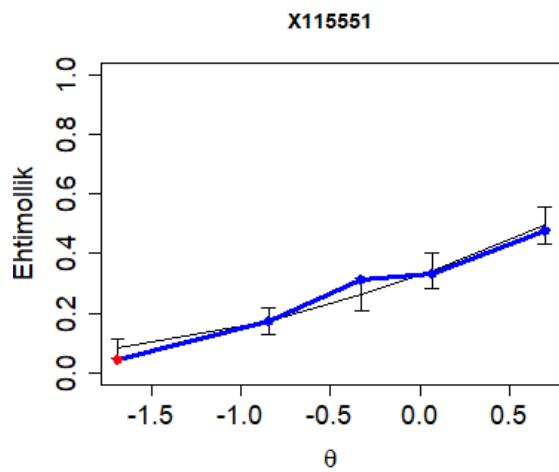
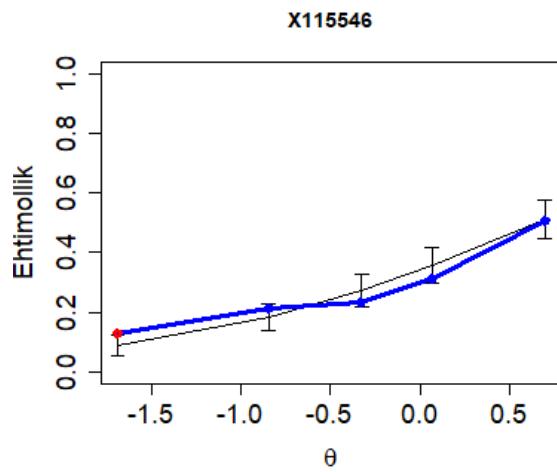
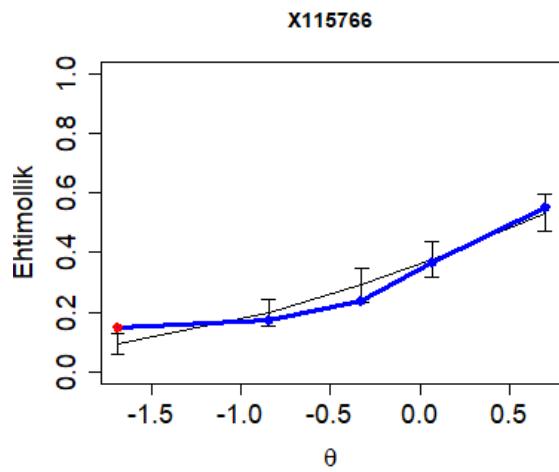


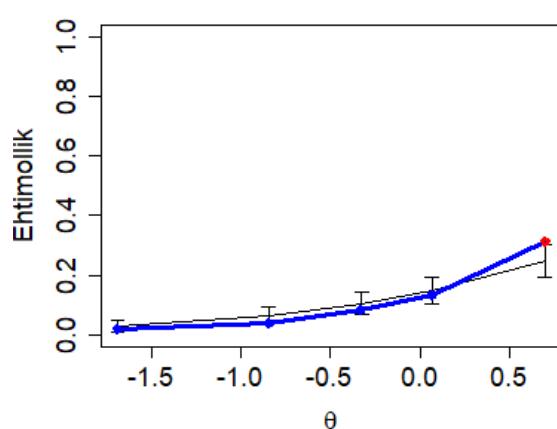
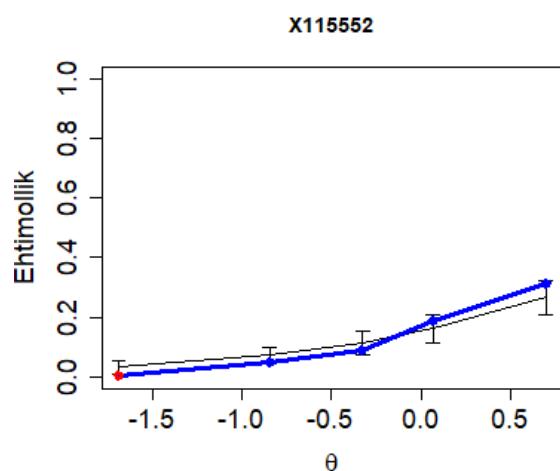
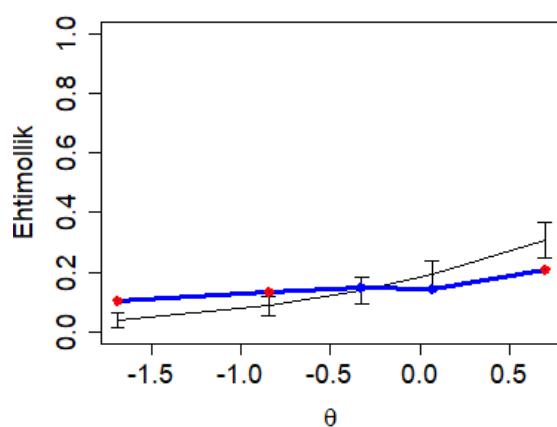
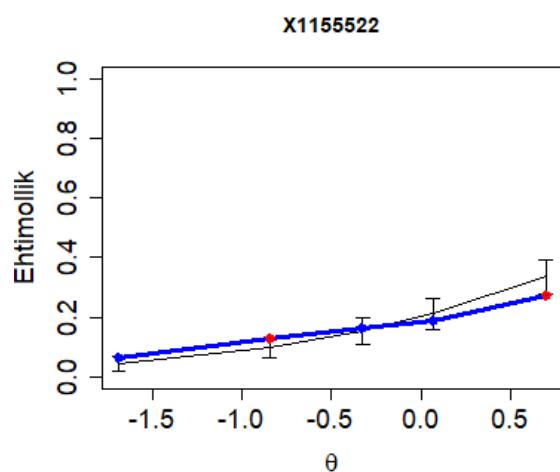
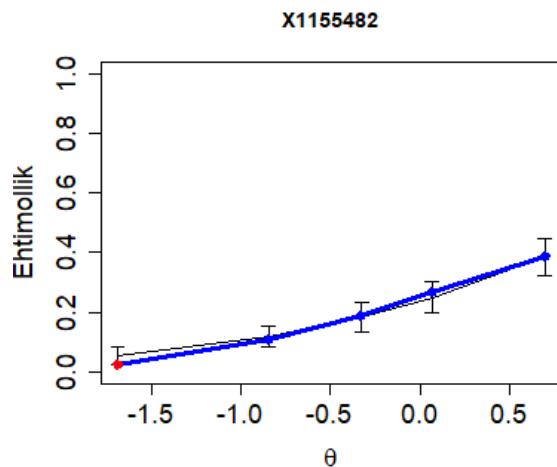
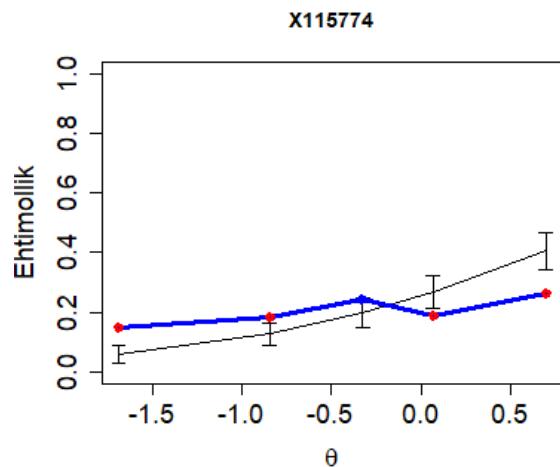


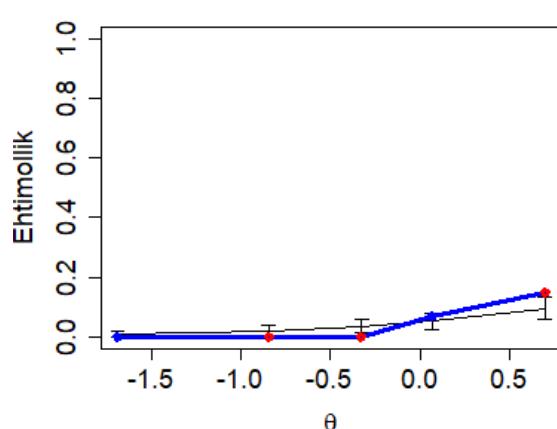
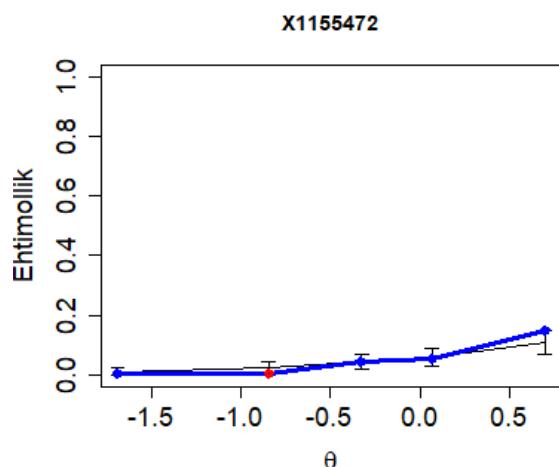
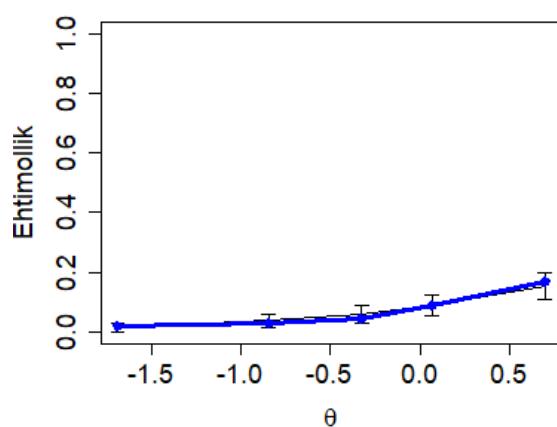
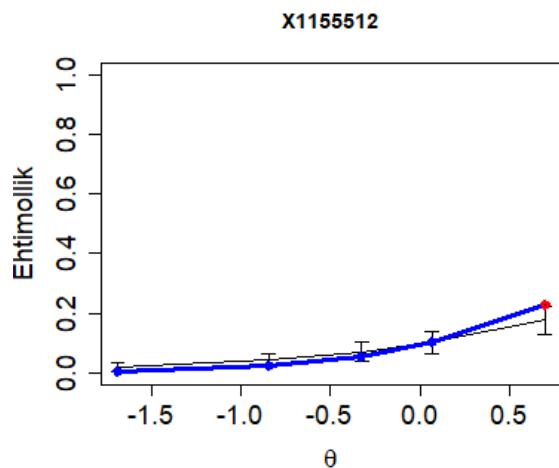
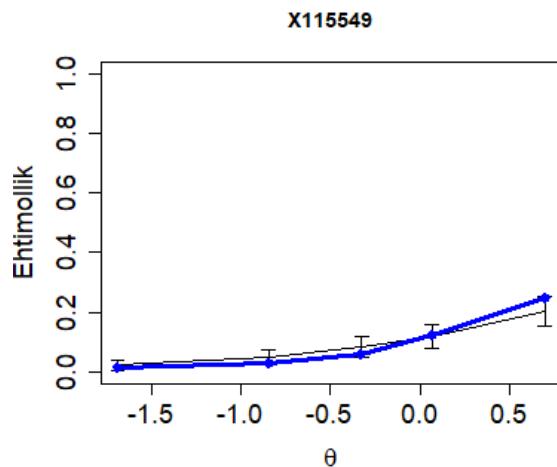
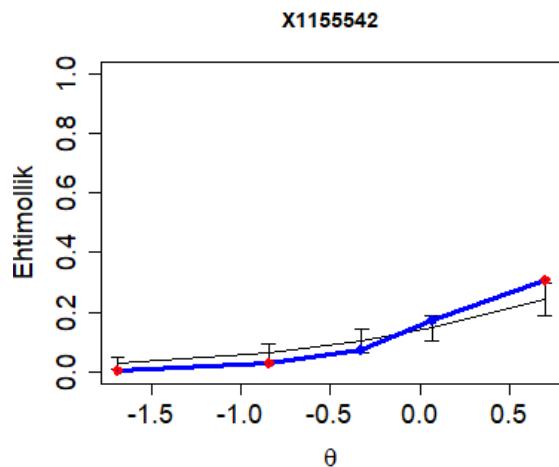


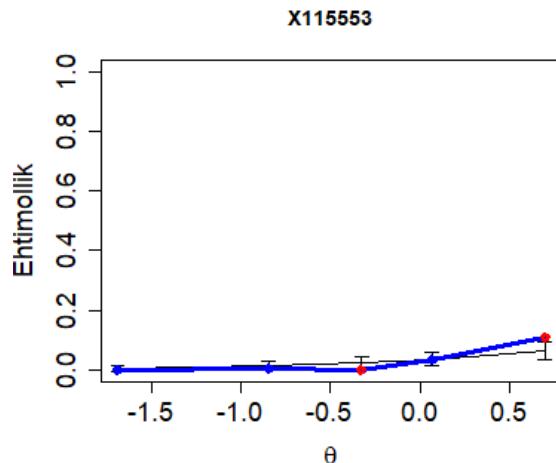








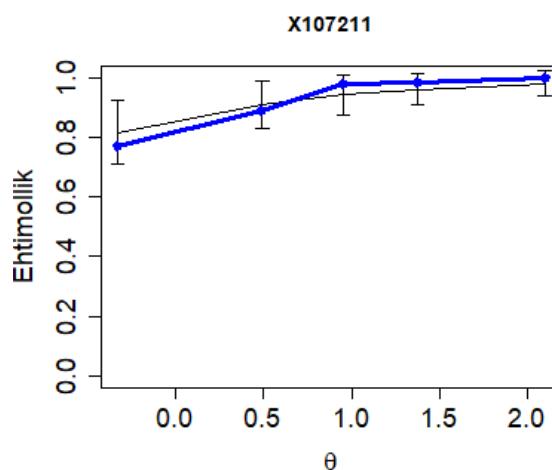
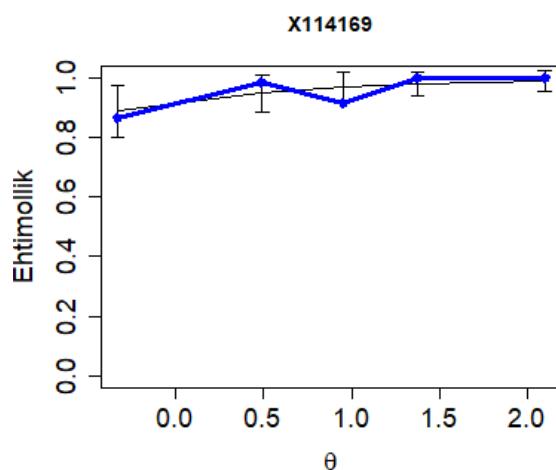


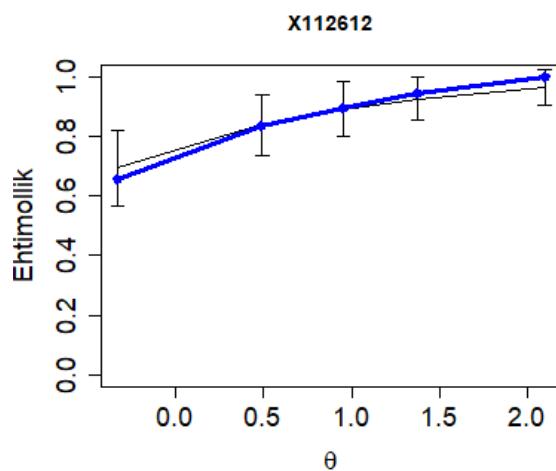
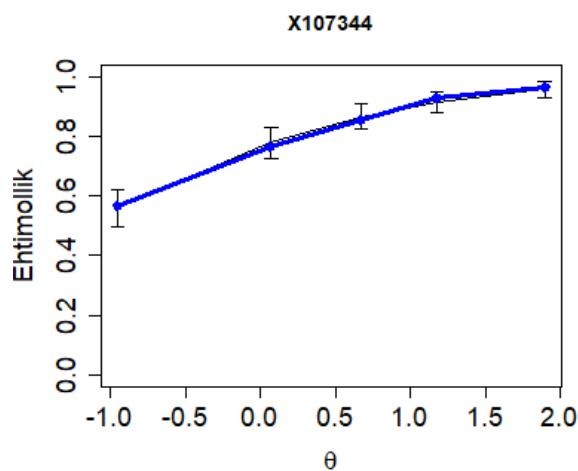
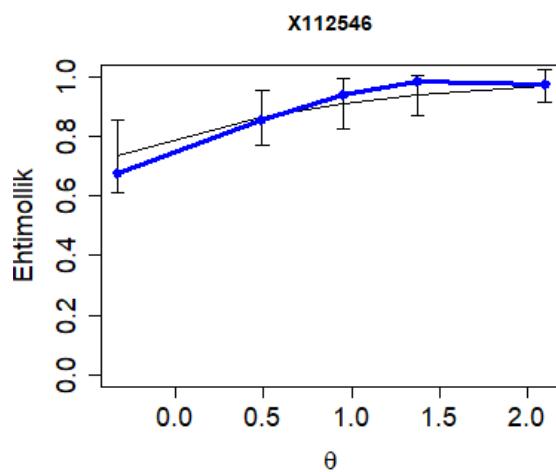
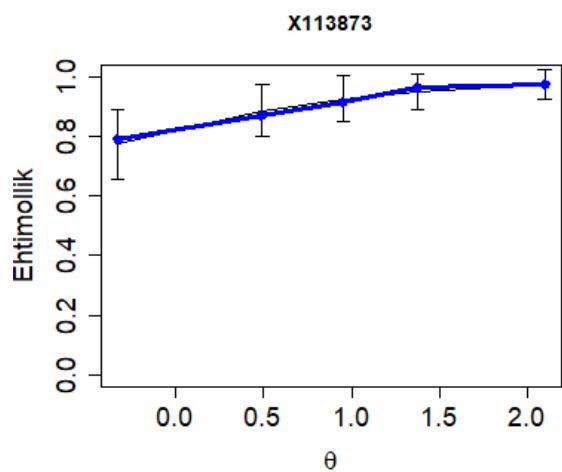
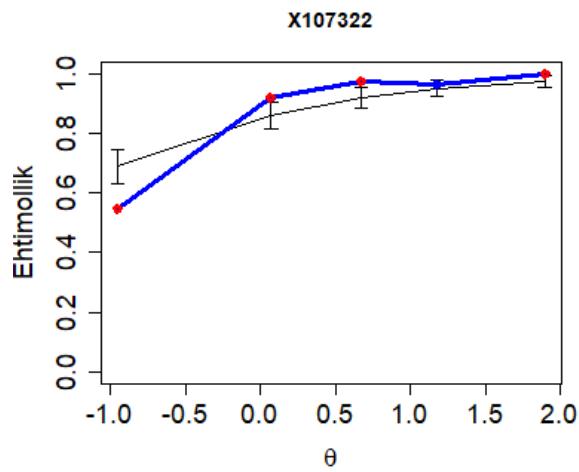
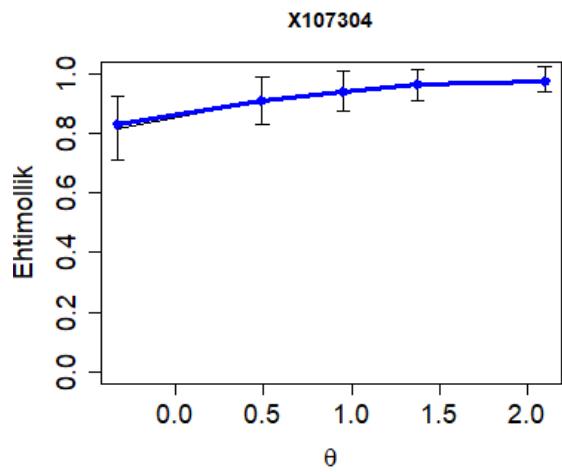


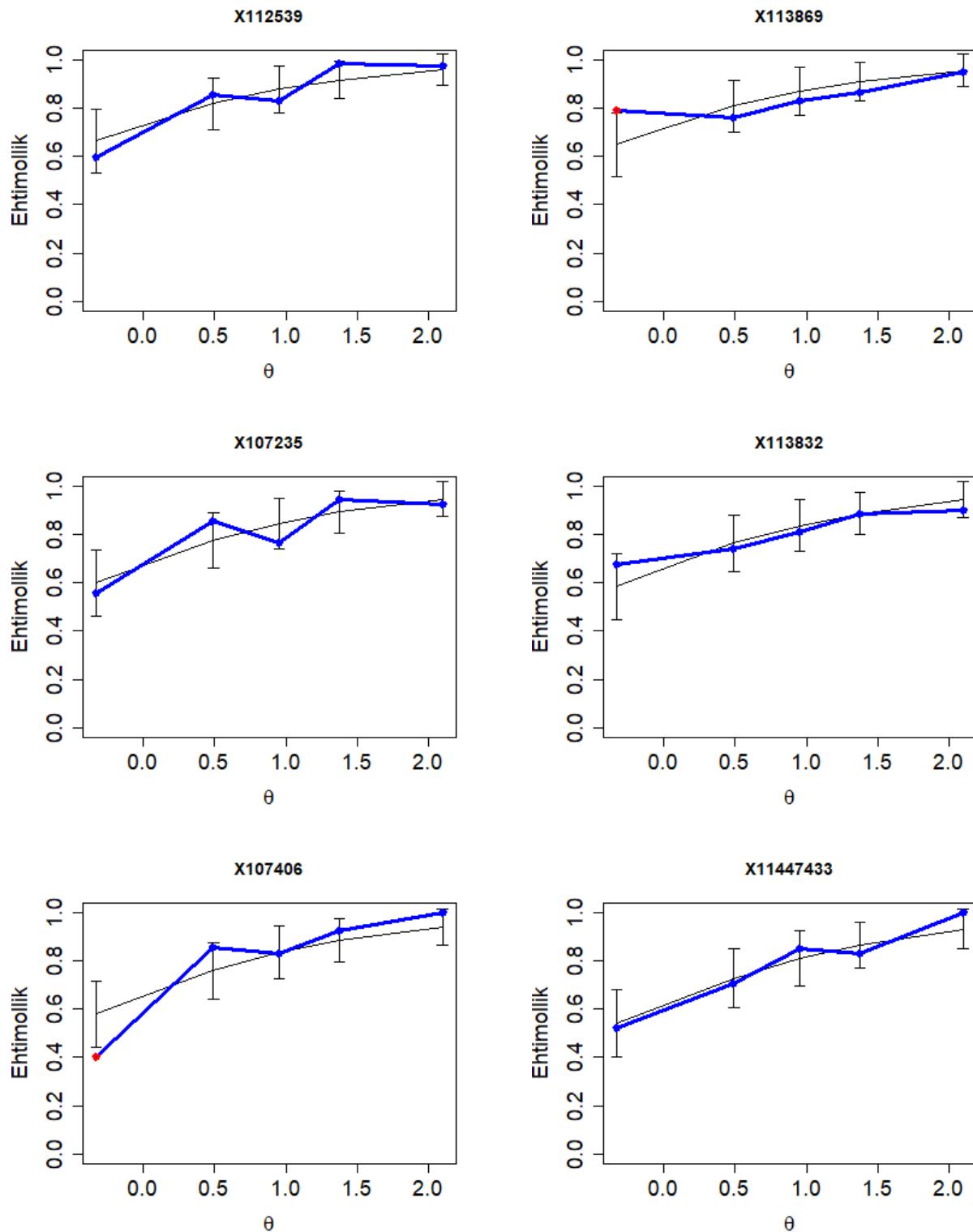
**5a-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovi natijalarining Rash modeli bilan mosligi**

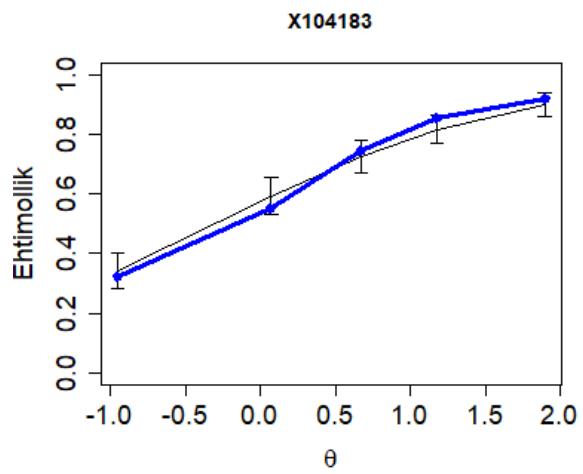
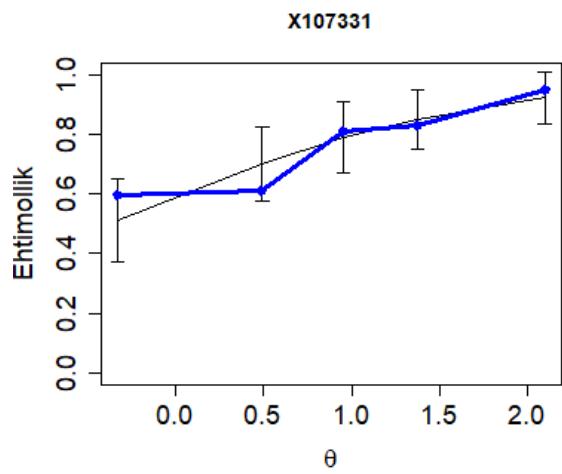
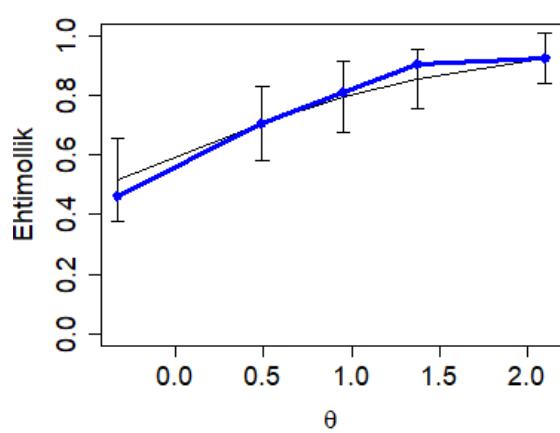
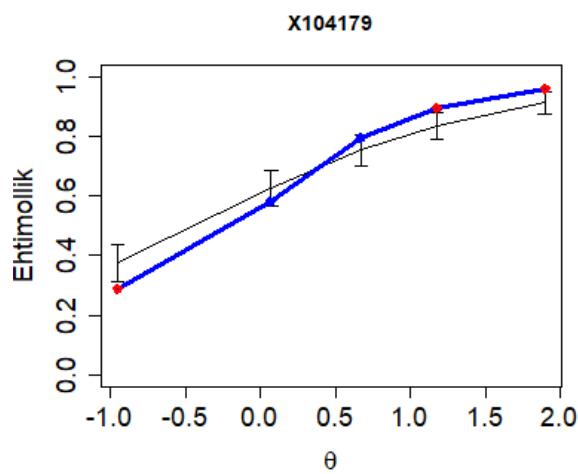
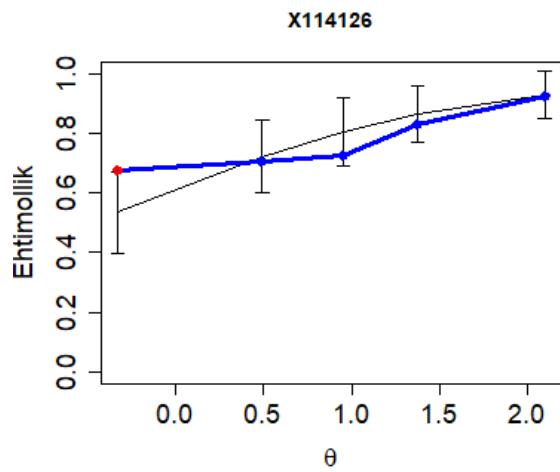
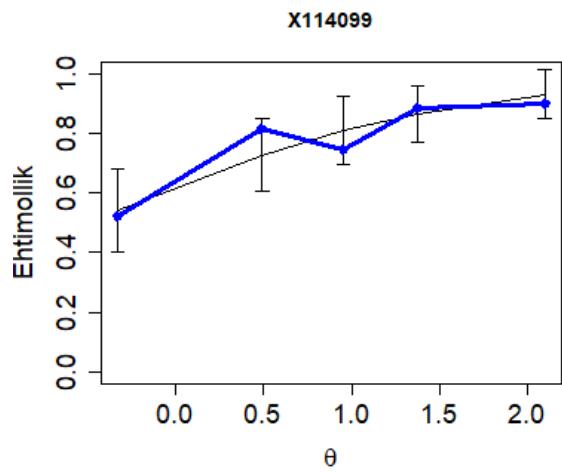
2-test sinovi tahlil natijalariga ko'ra esa, ID raqamlari - 107322 va 11447434 bo'lgan test topshiriqlarining Rash modeli bilan

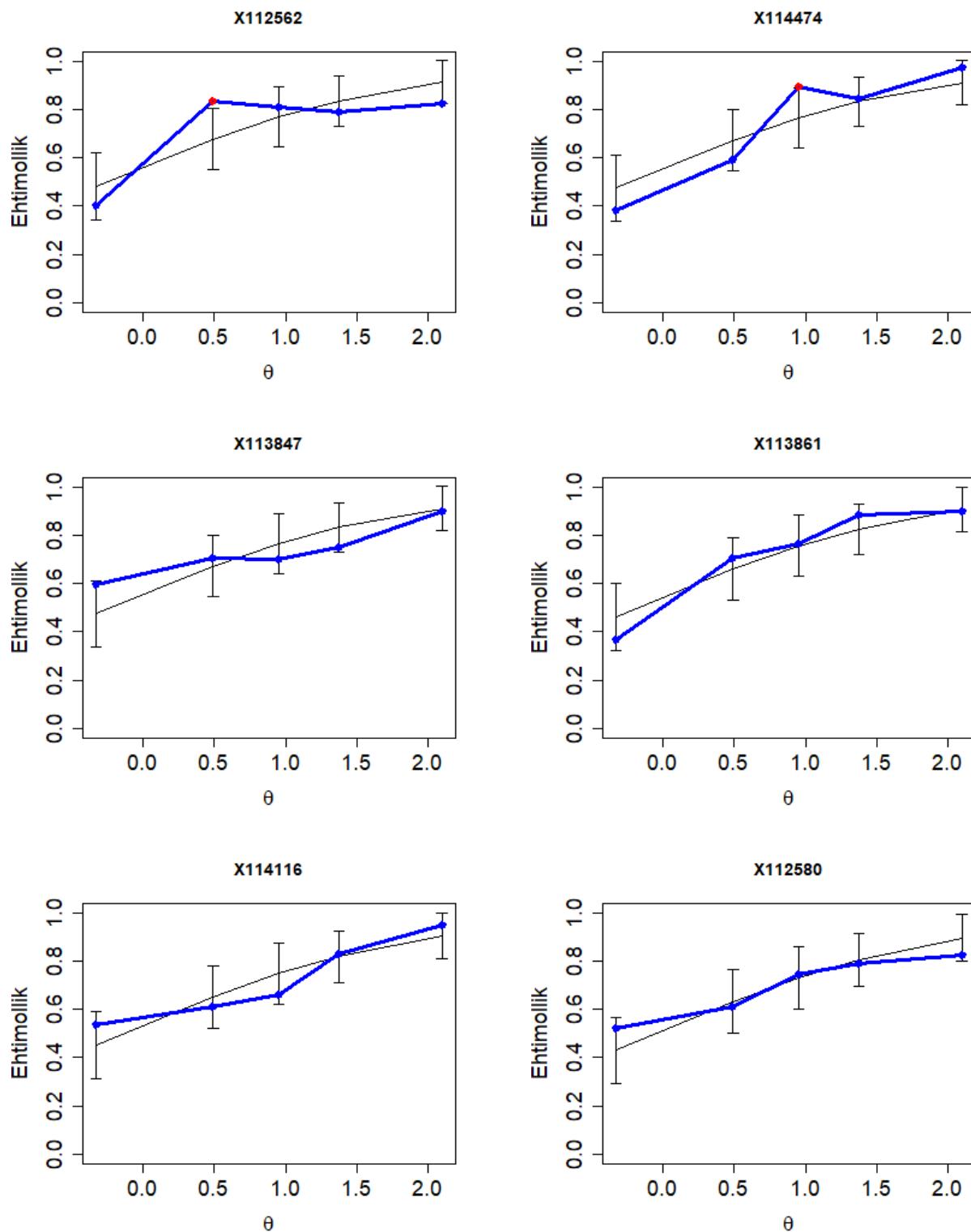
moslik darajasi yaxshi emasligini ya'ni bunda ham ajratilgan qobiliyat guruhlarining barchasi bilan mos tushmaganligini bildiradi (5b-rasm).

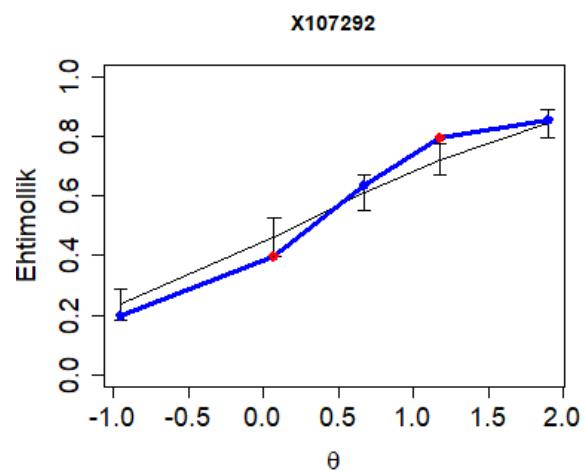
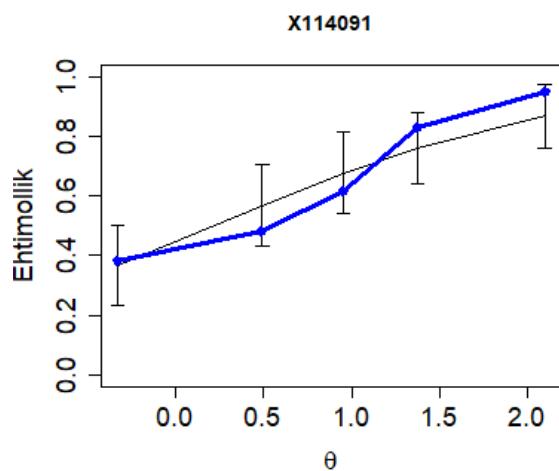
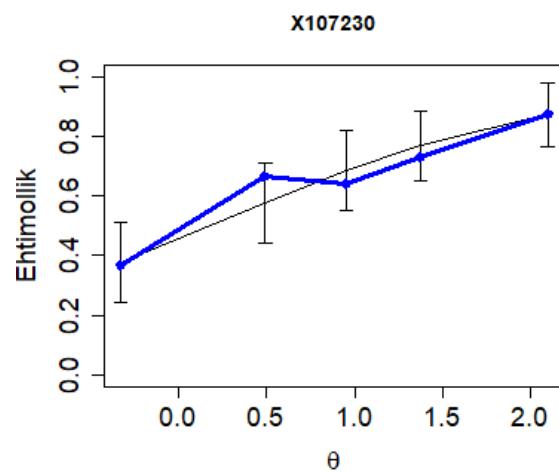
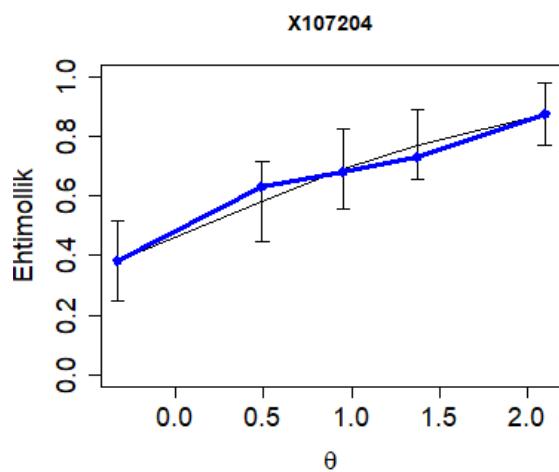
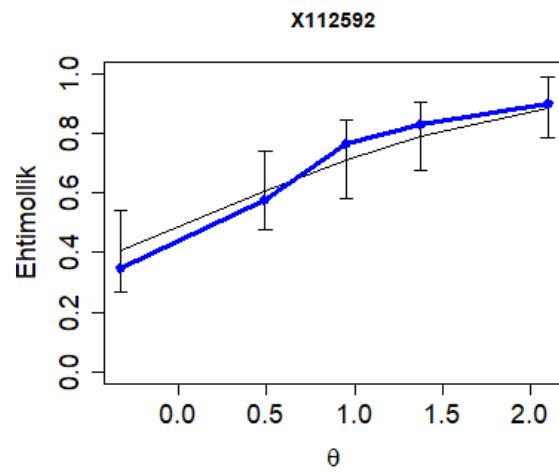
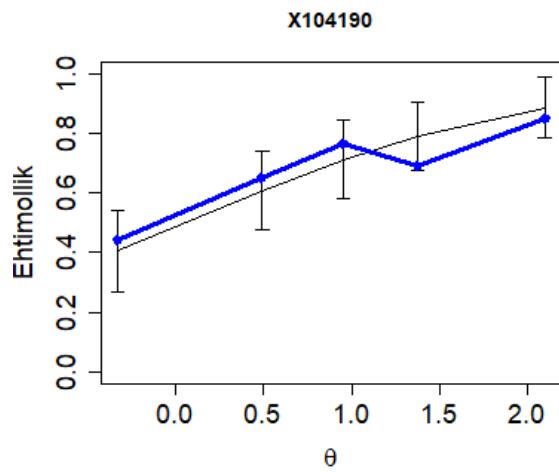


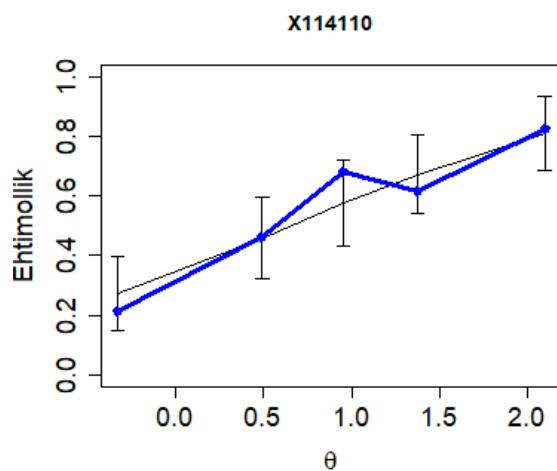
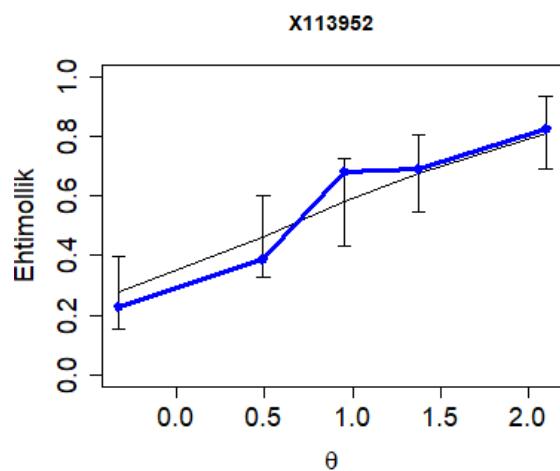
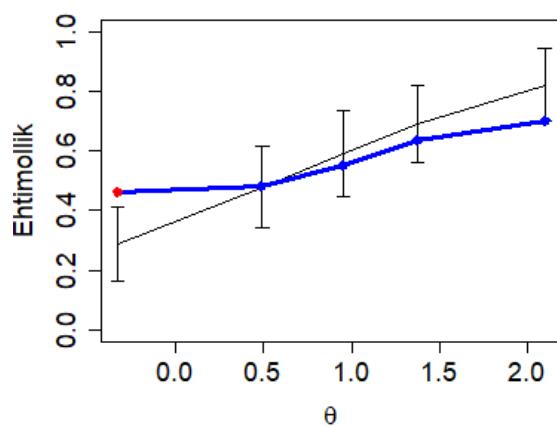
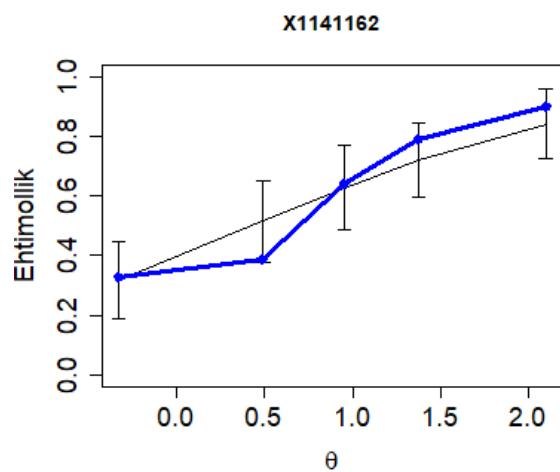
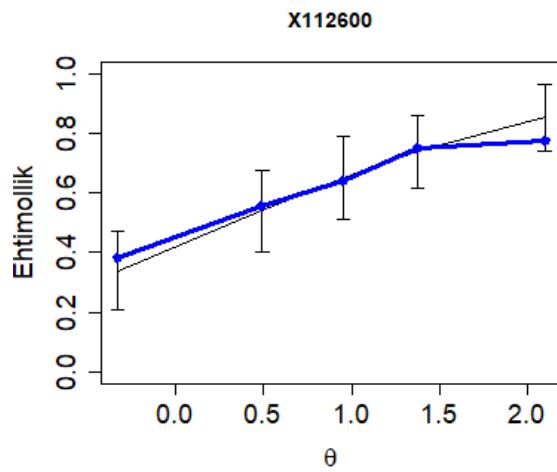
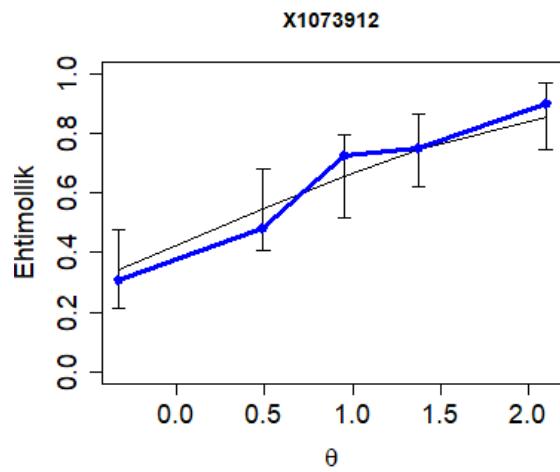


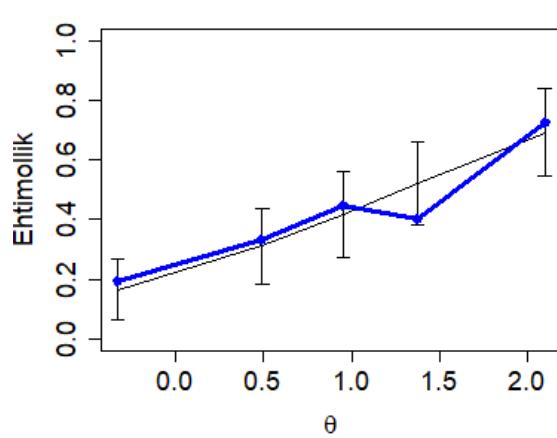
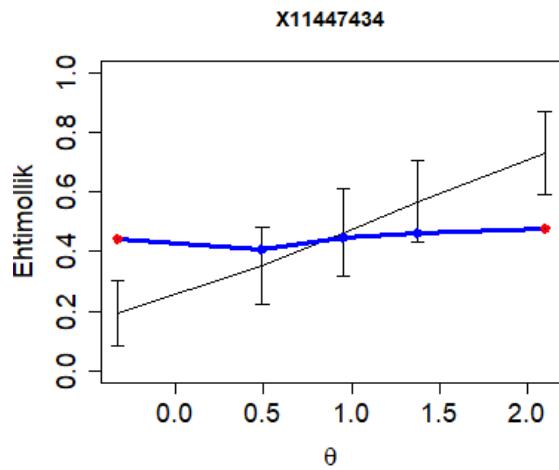
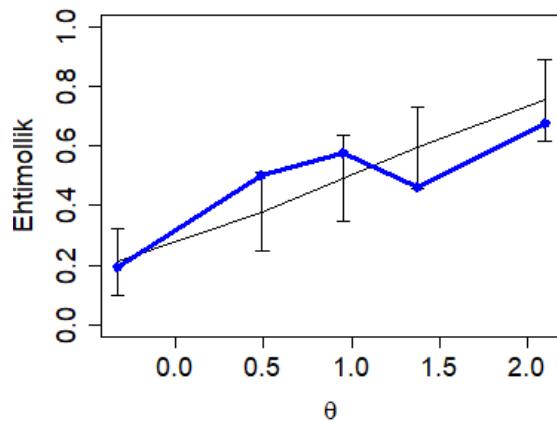
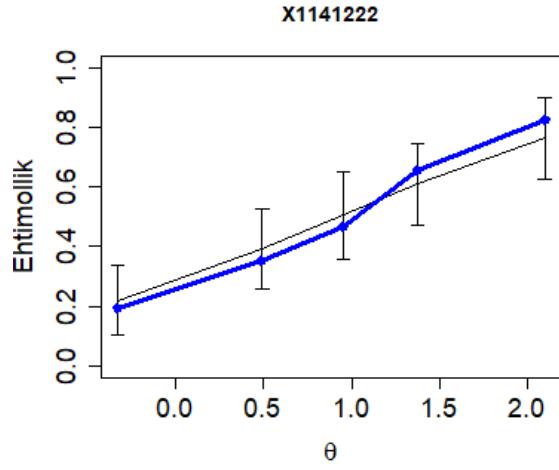
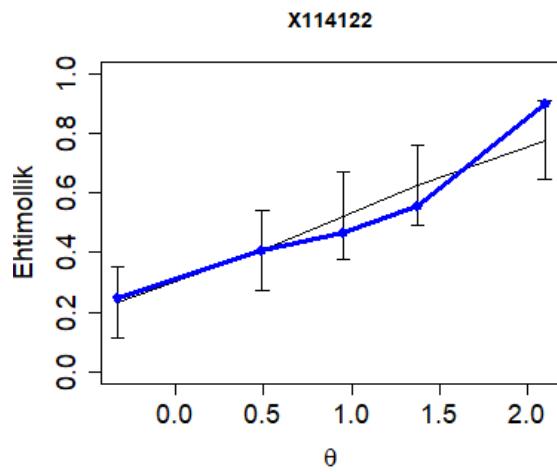
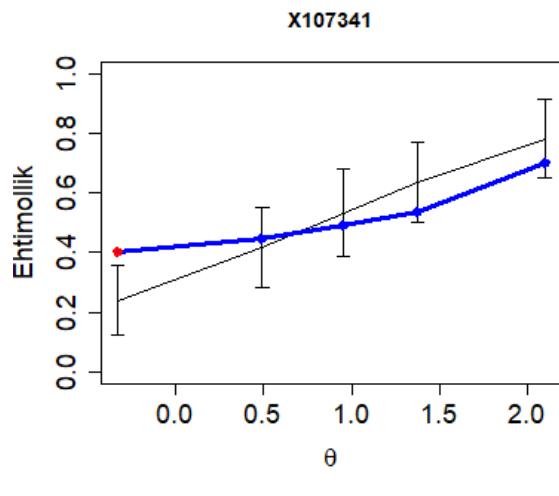


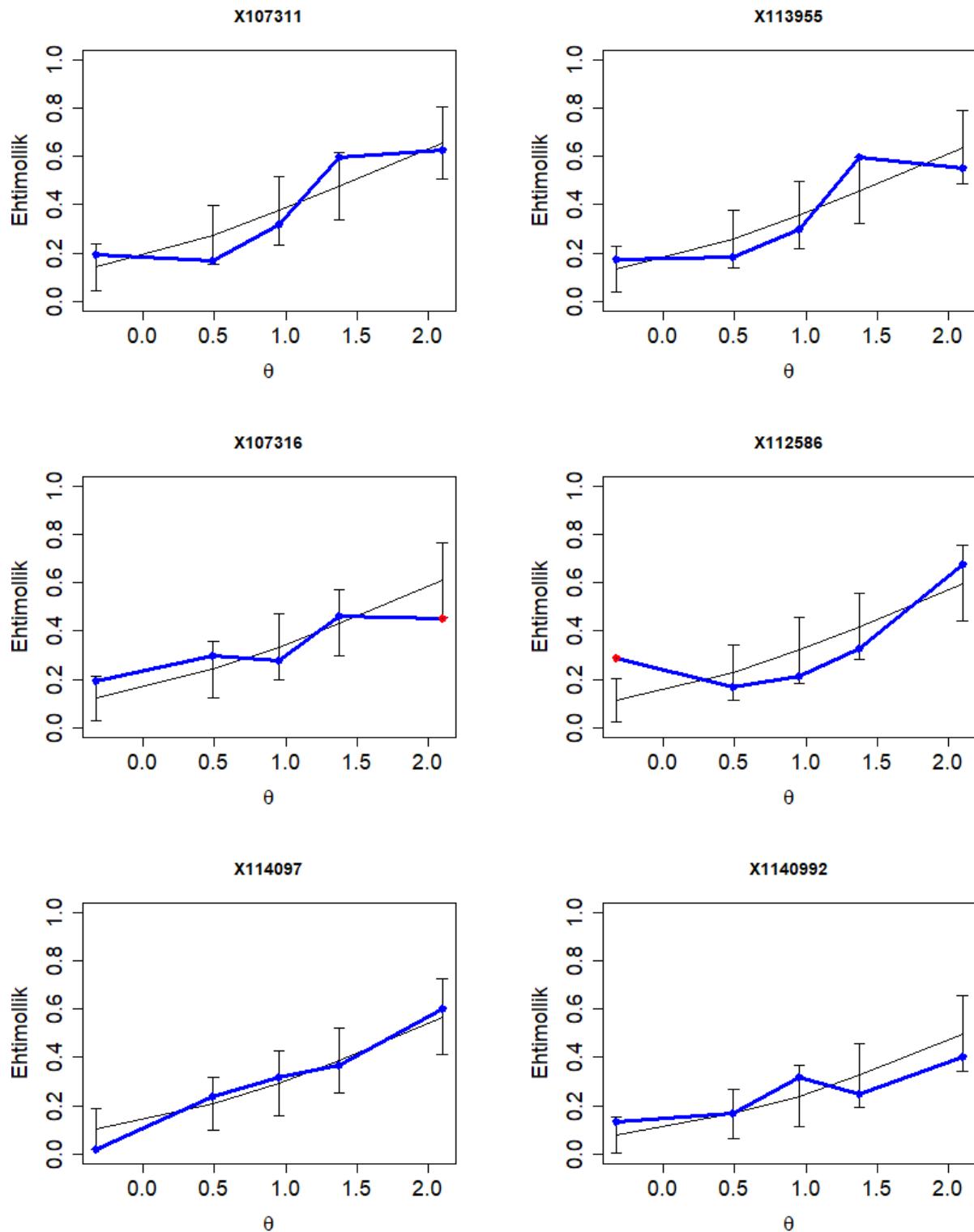


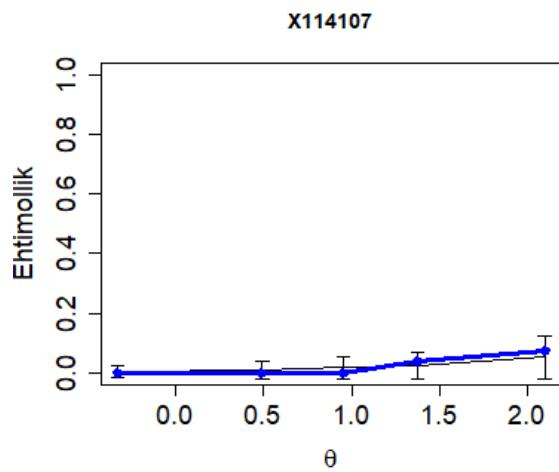
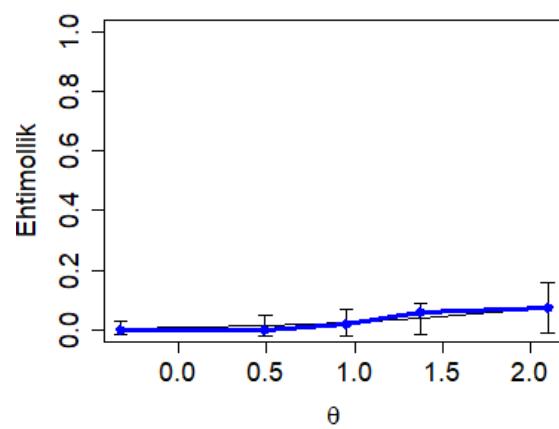
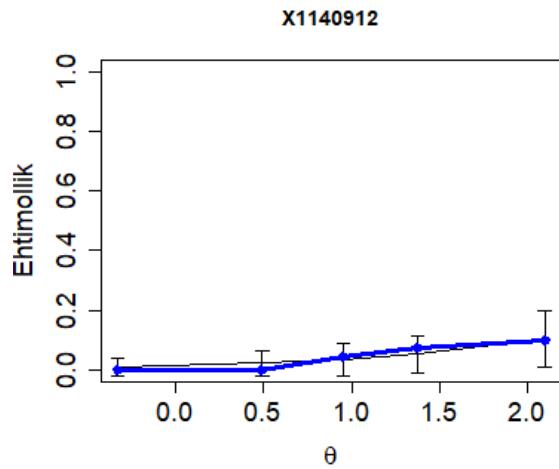
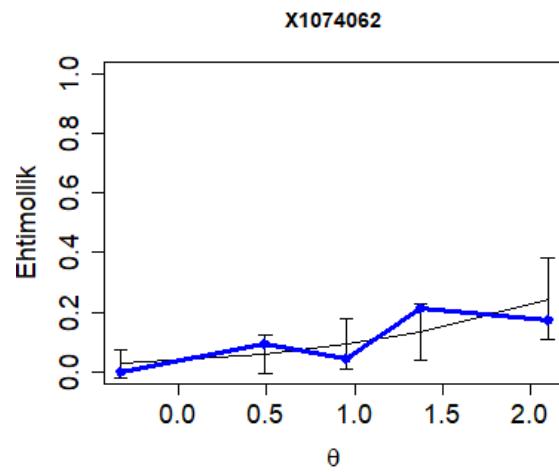
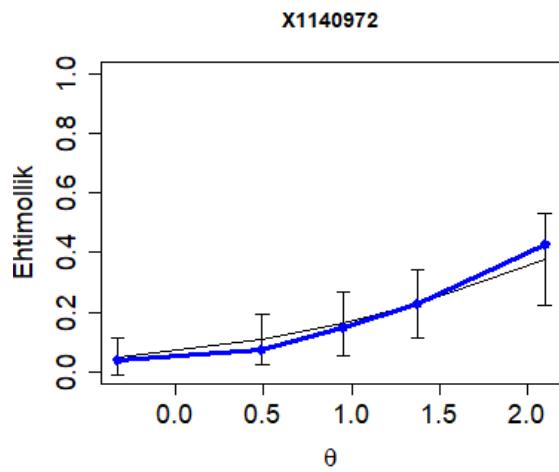












### 5b-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 2-test sinovi natijalarining Rash modeli bilan mosligi

3-test sinovi tahlil natijalariga ko'ra, ID raqamlari - 107402 va 112560 bo'lgan test topshiriqlarining

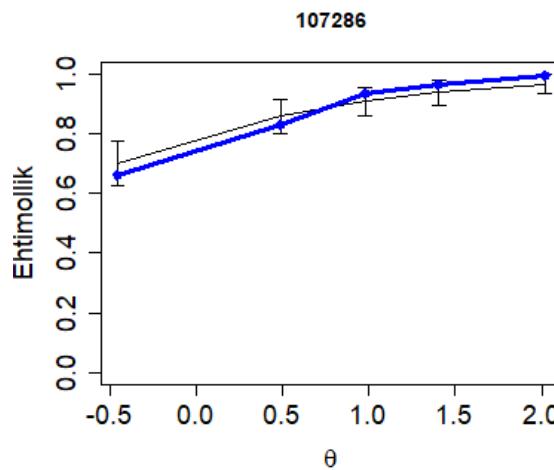
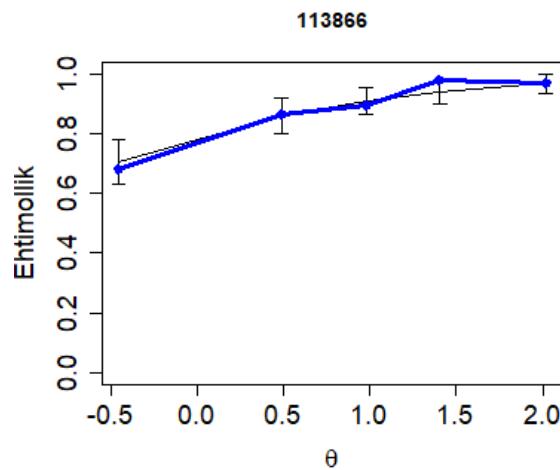
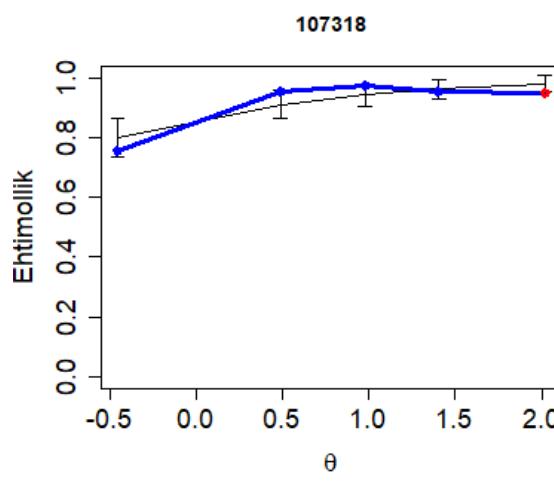
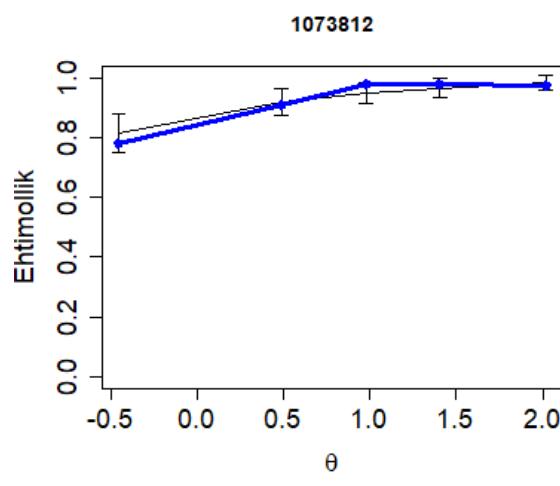
Rash modeli bilan moslik darajasi yaxshi emasligini ya'ni bunda ham ajratilgan qobiliyat guruhlarining

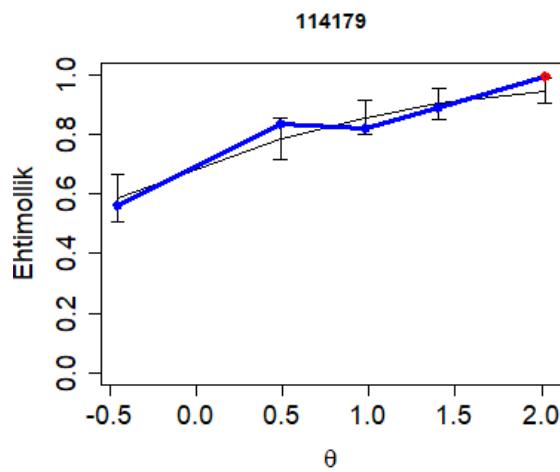
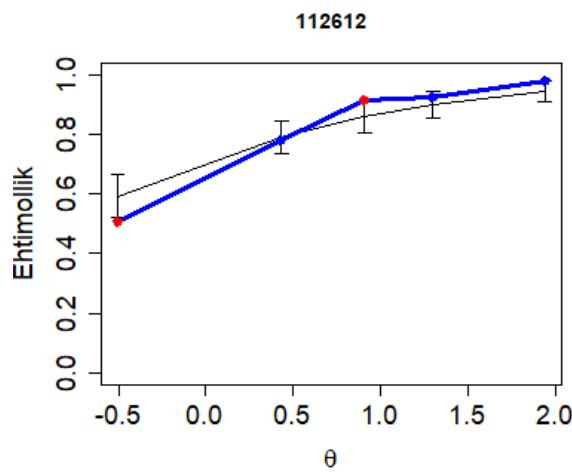
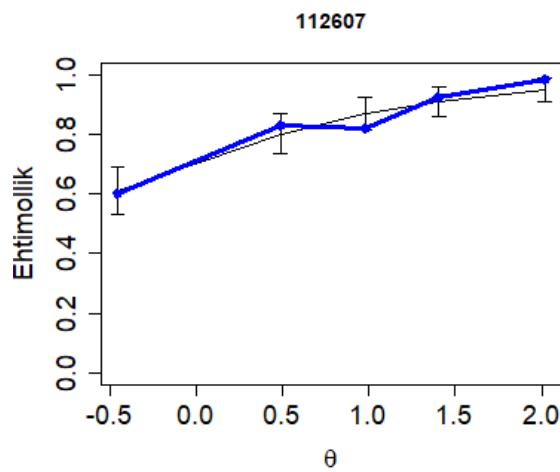
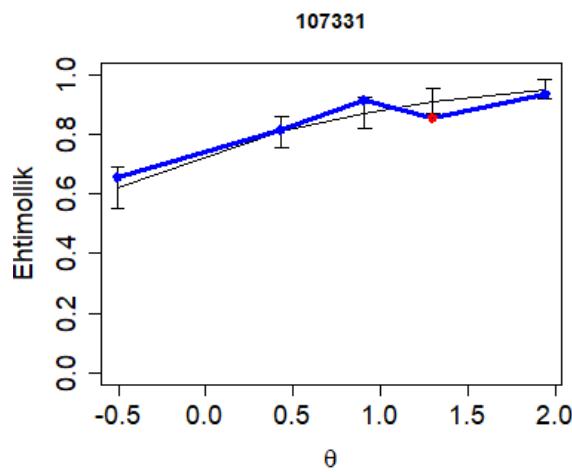
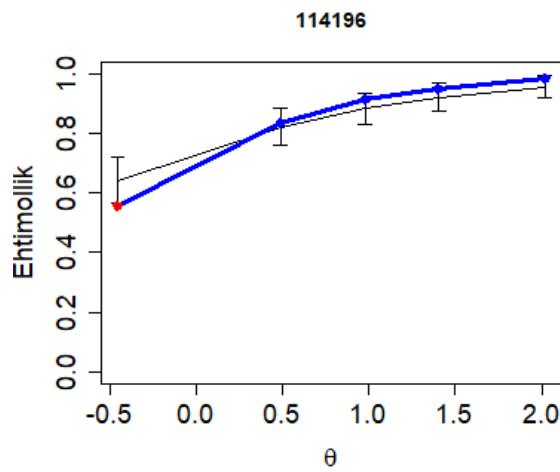
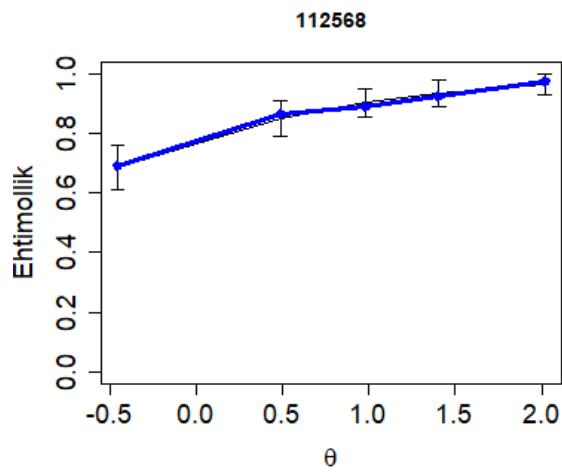
barchasi bilan mos tushmaganligini bildiradi (5c-rasm).

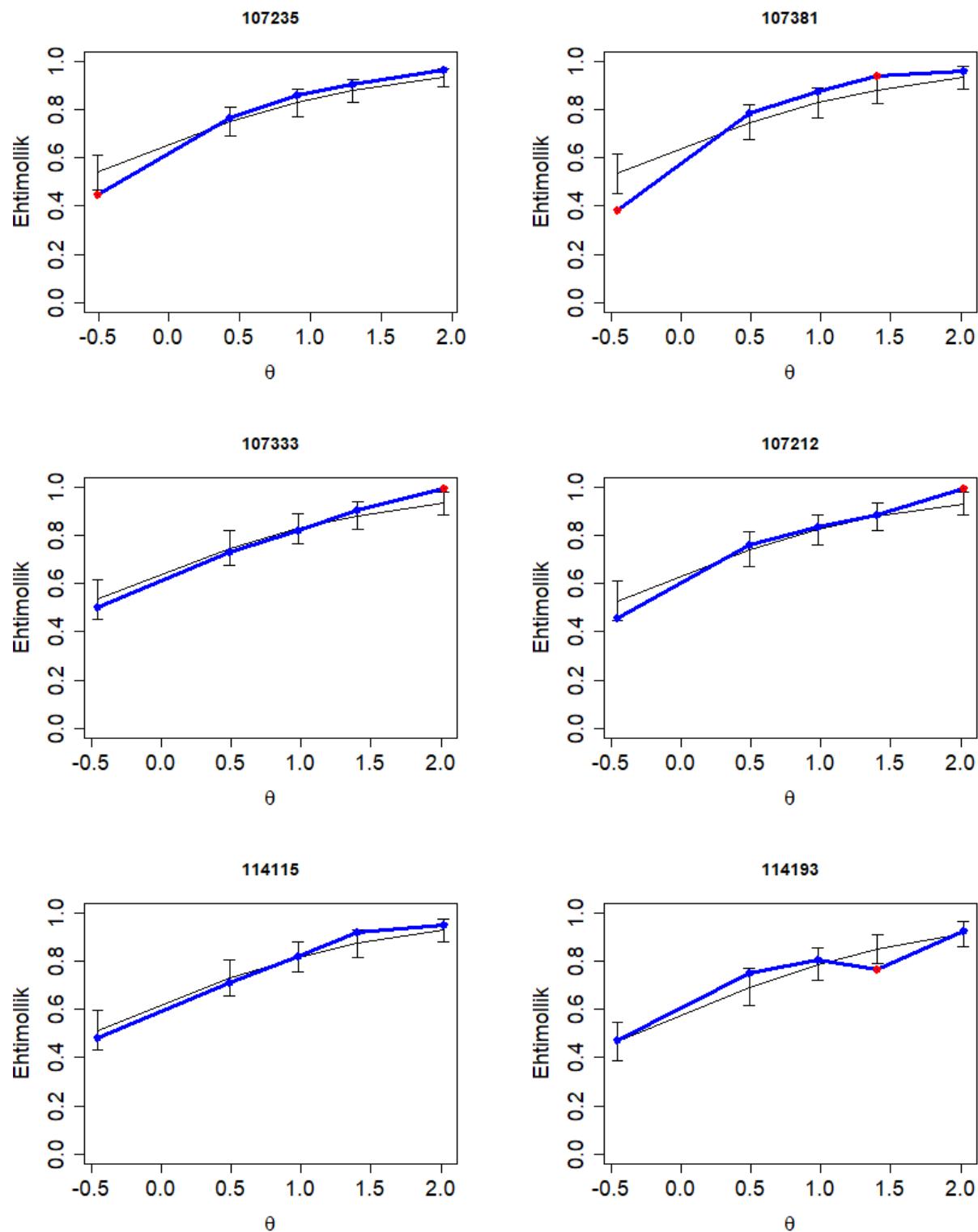
Geografiya fanidan yuqori sifatli kalibrovkalangan test topshiriqlari bazasini yaratishda yuqorida keltirilgan Rash modeli bilan mos kelmagan test topshiriqlarini kalibirovkalangan test bazasiga

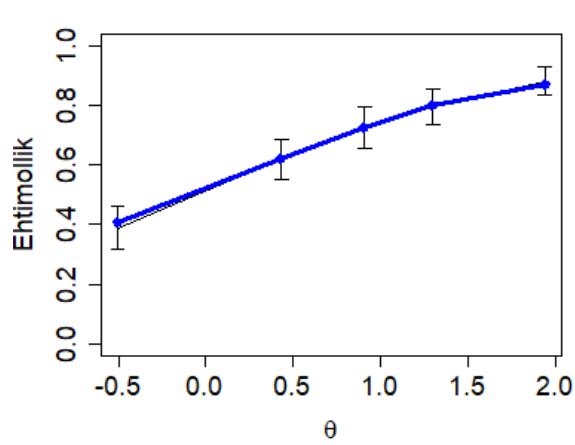
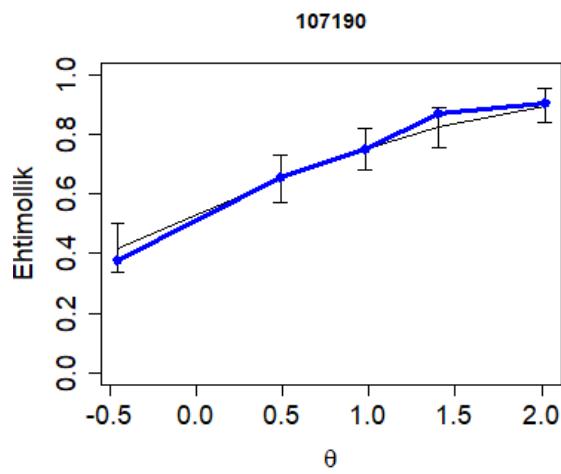
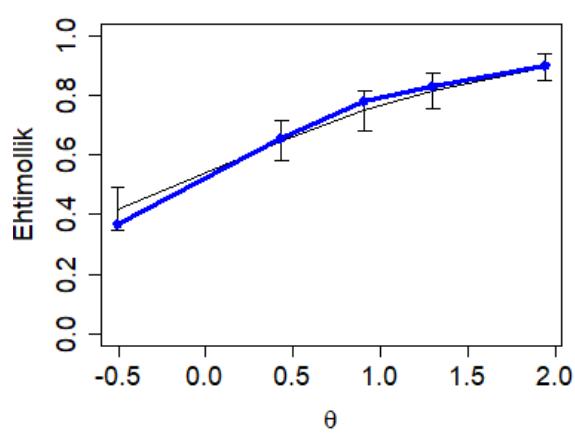
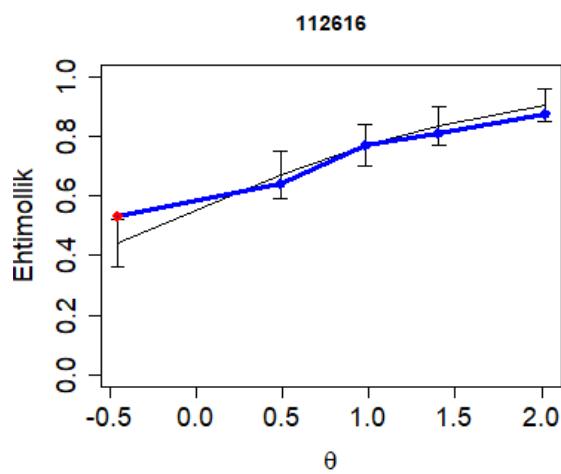
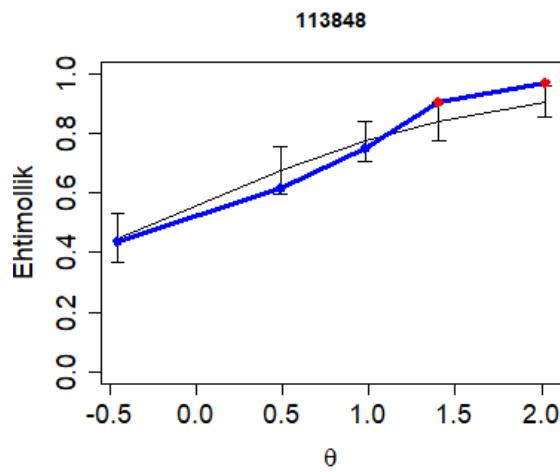
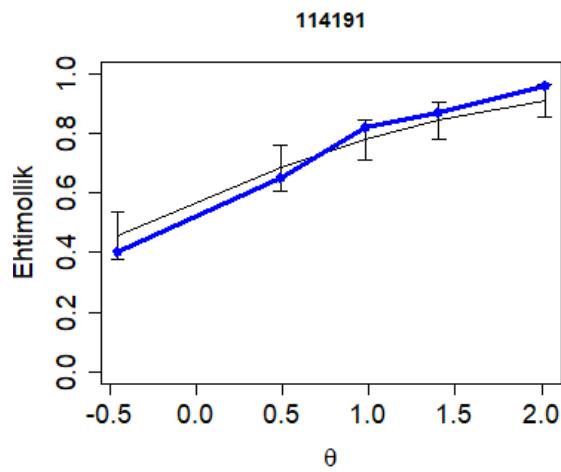
qo'shishdan oldin qayta ko'rib chiqish lozim.

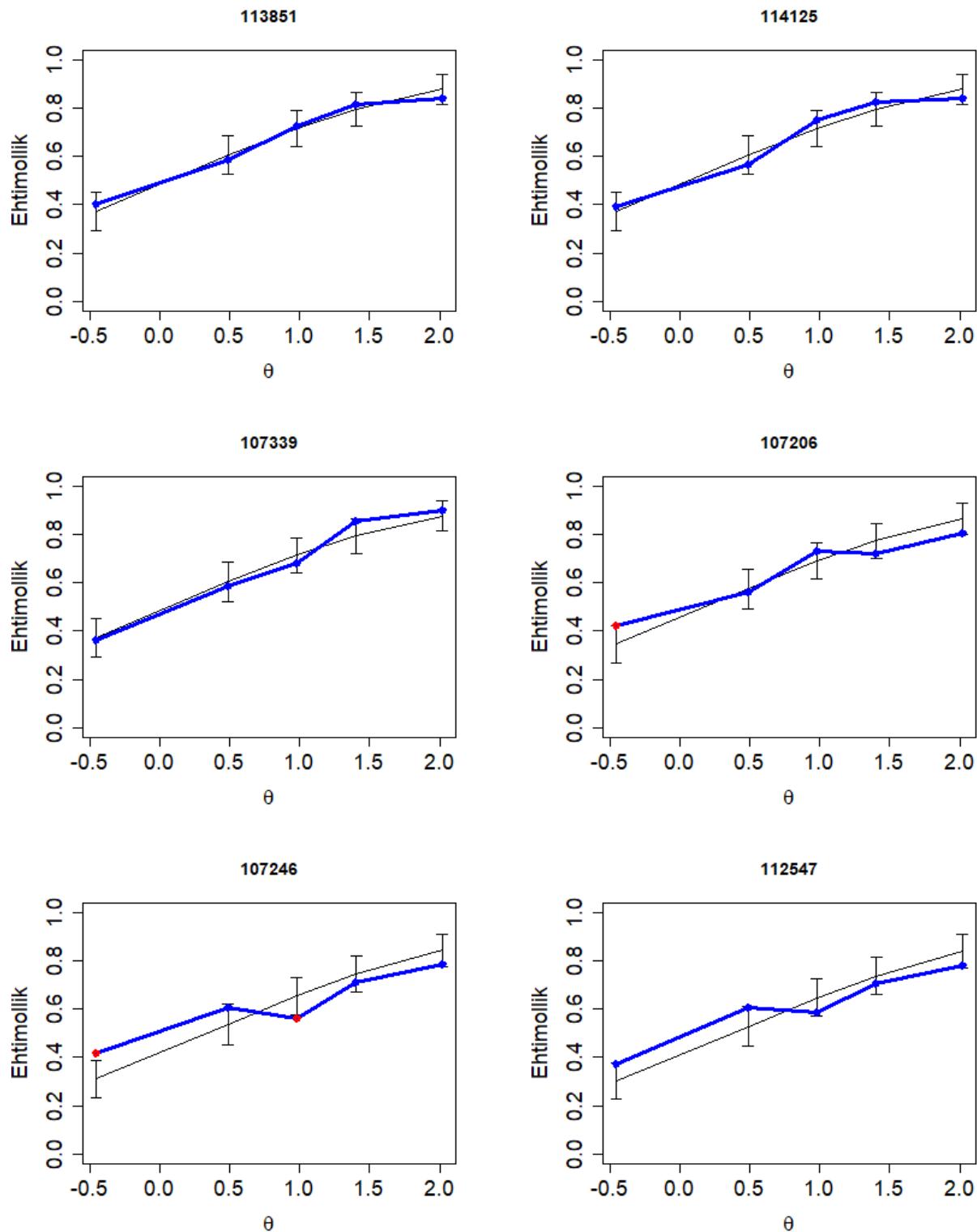
Umumiy holda test topshiriqlari xususiyatlarini Rash modelga moslashtirish muammoli elementlarni va o'ziga xos xususiyatlarga ega bo'lgan qobiliyatlarni ajratish imkonini beradi.

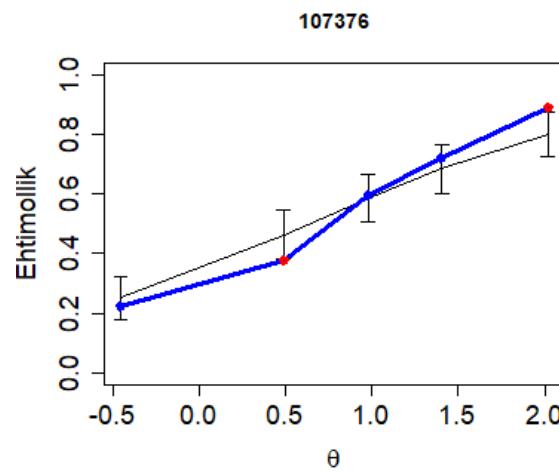
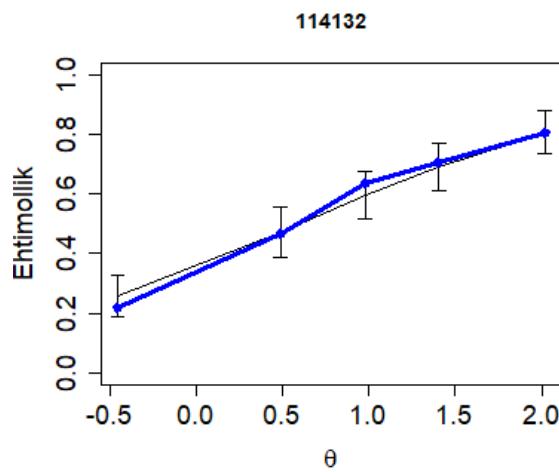
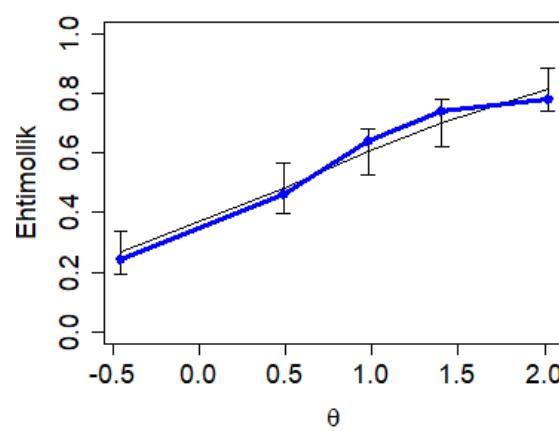
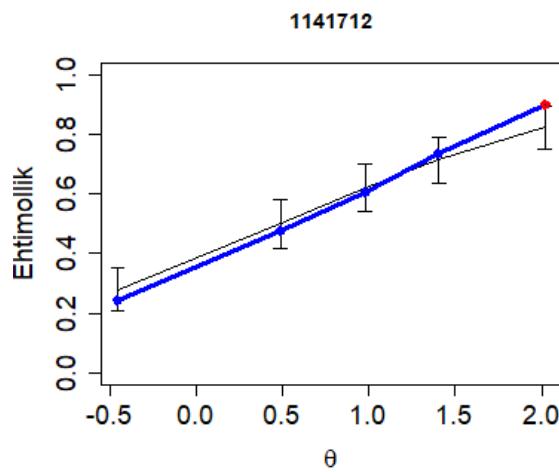
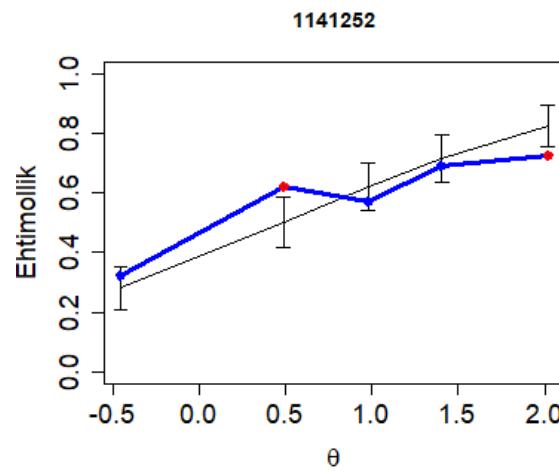
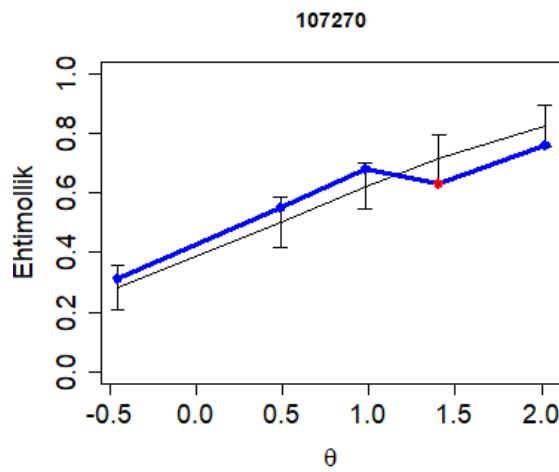


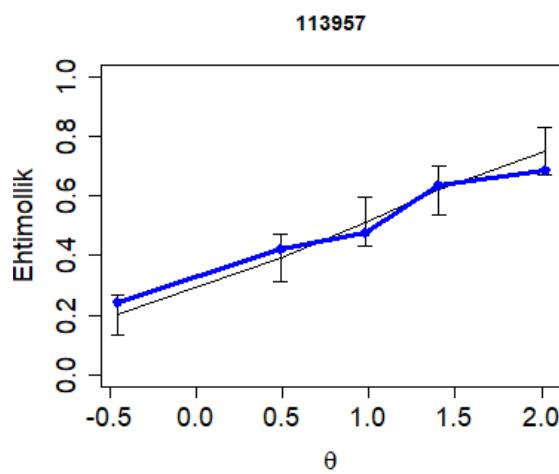
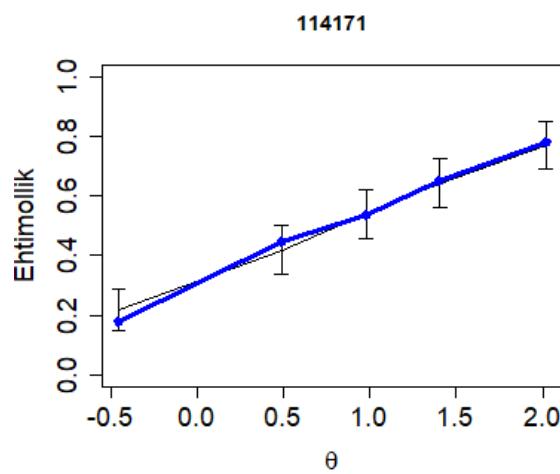
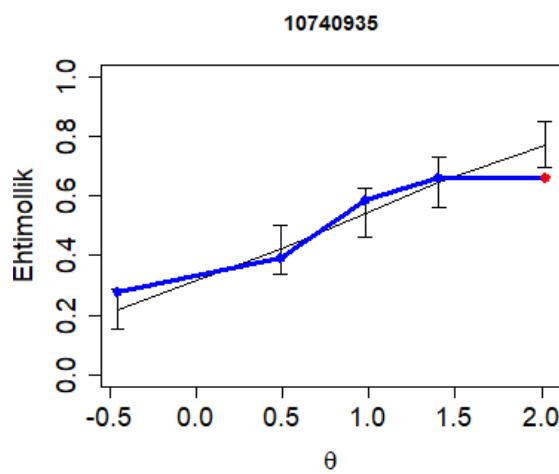
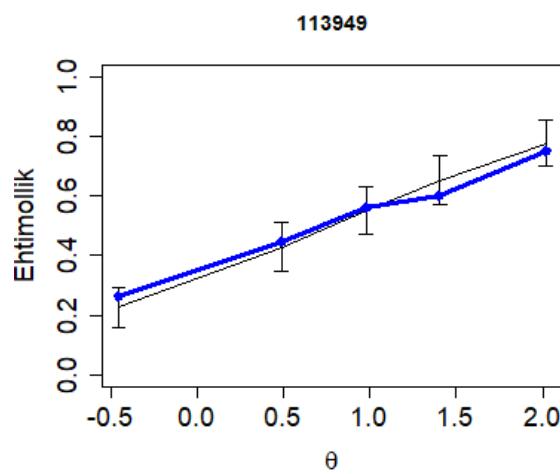
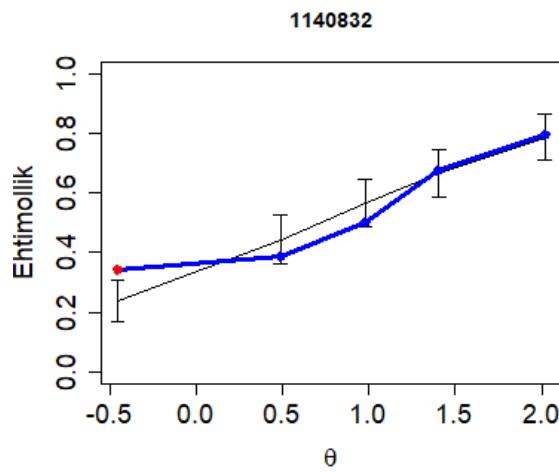
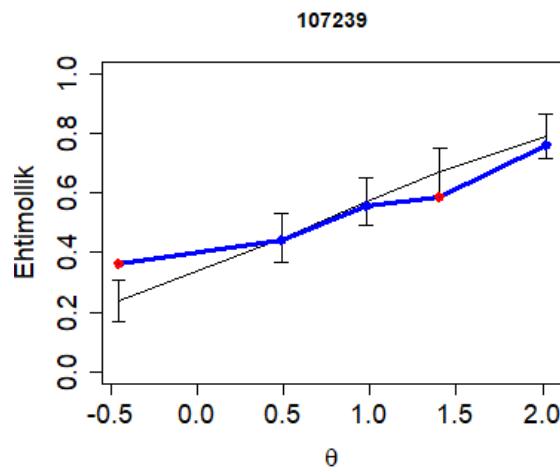


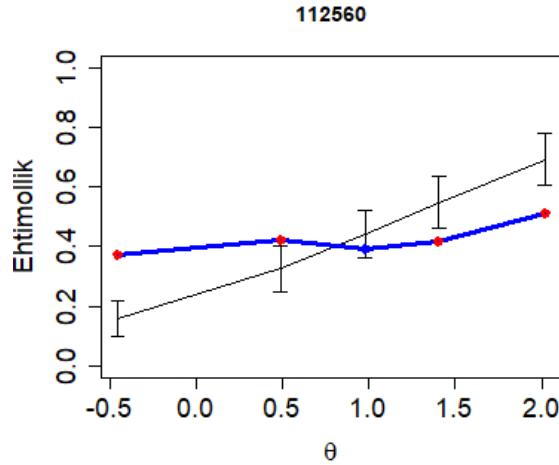
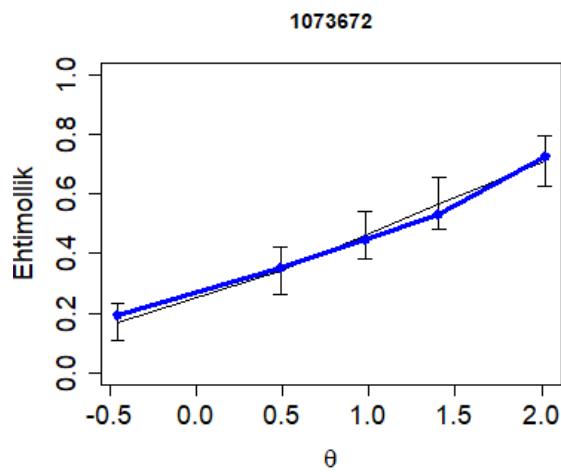
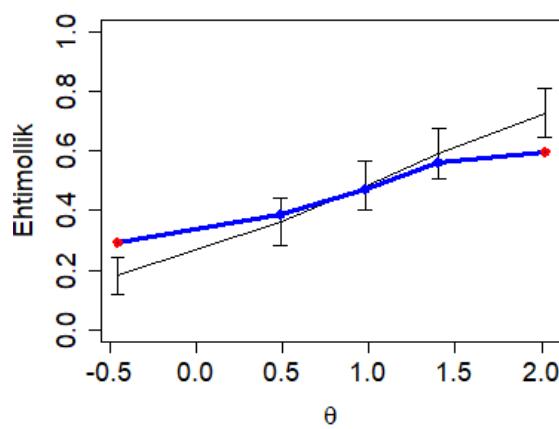
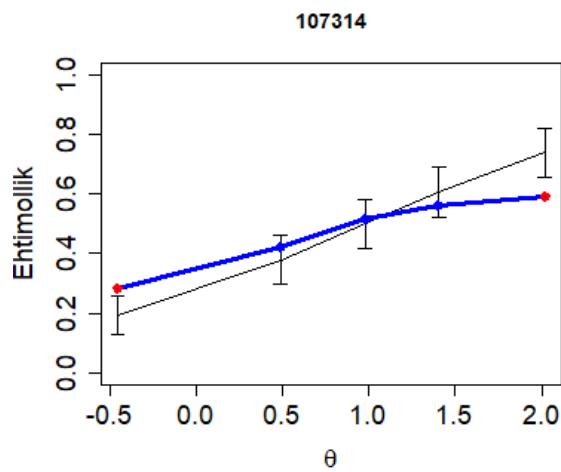
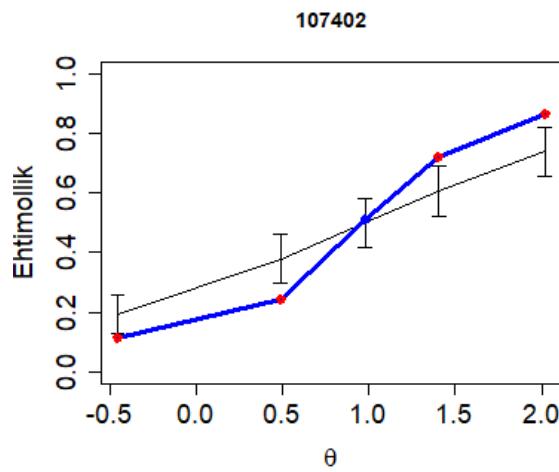
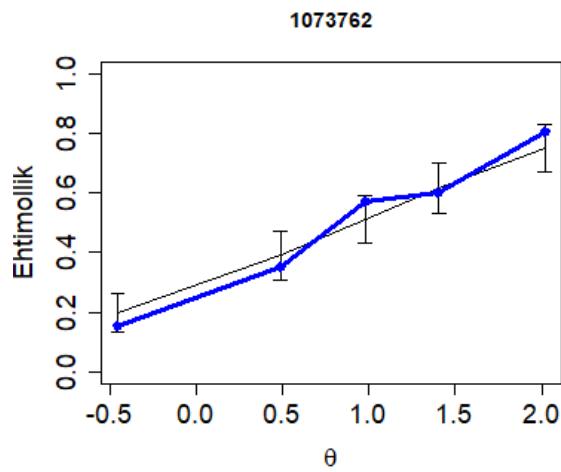


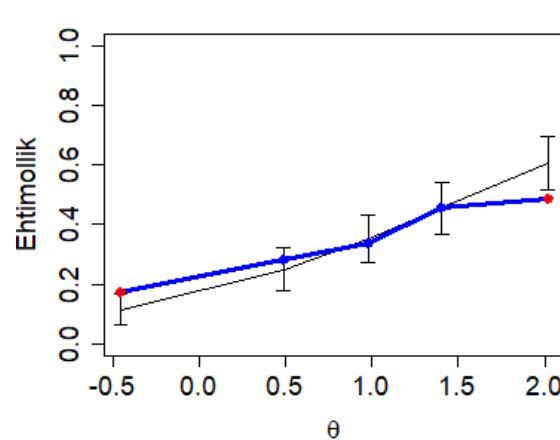
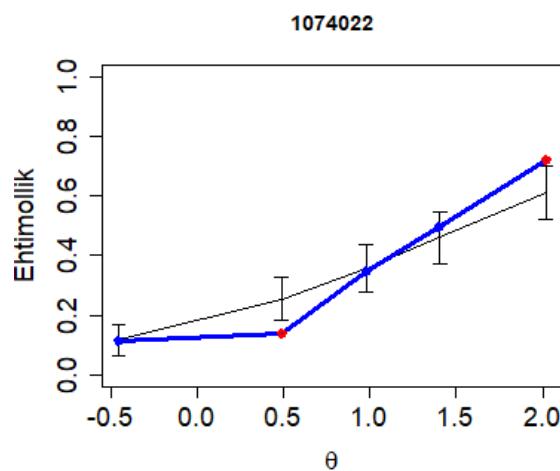
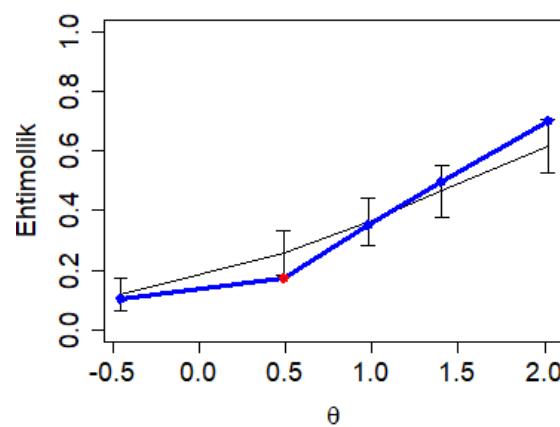
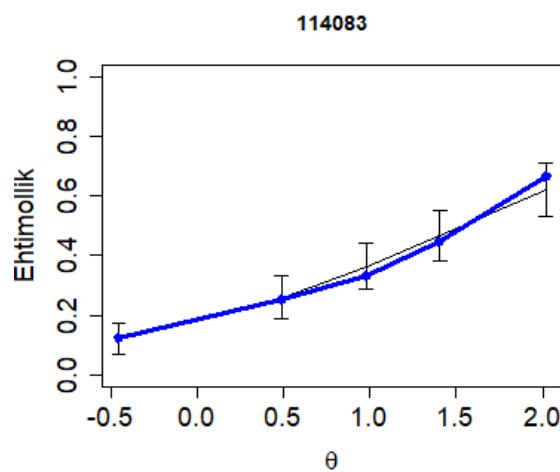
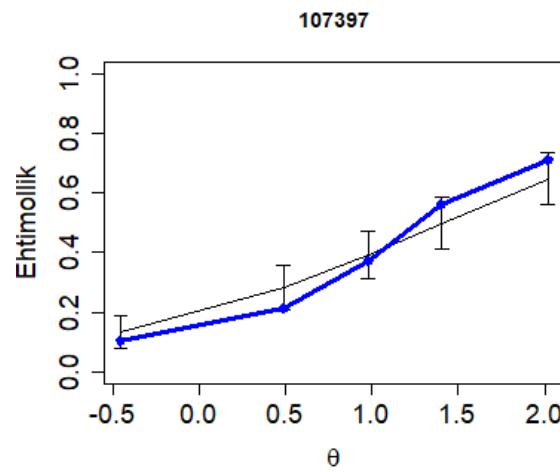
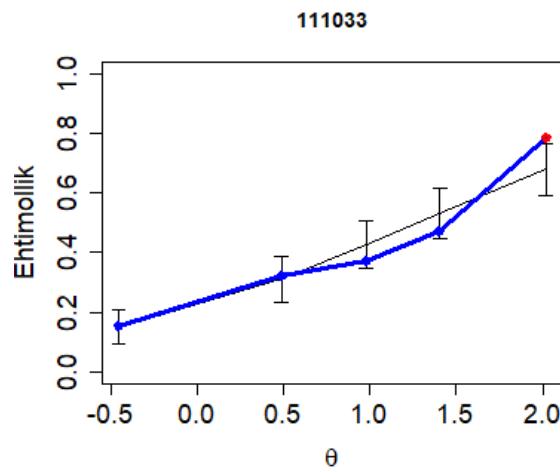


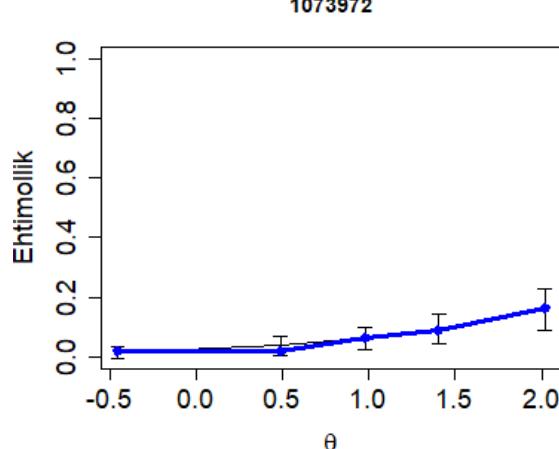
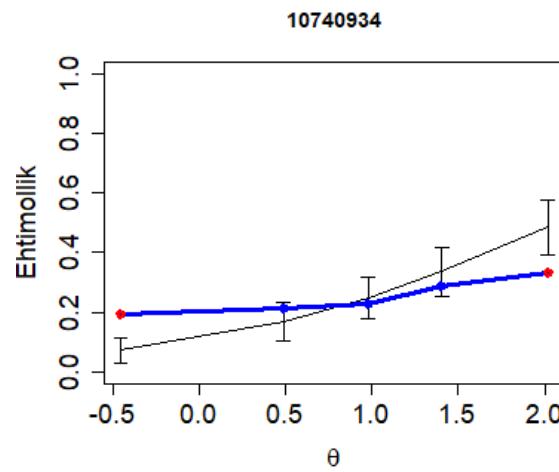
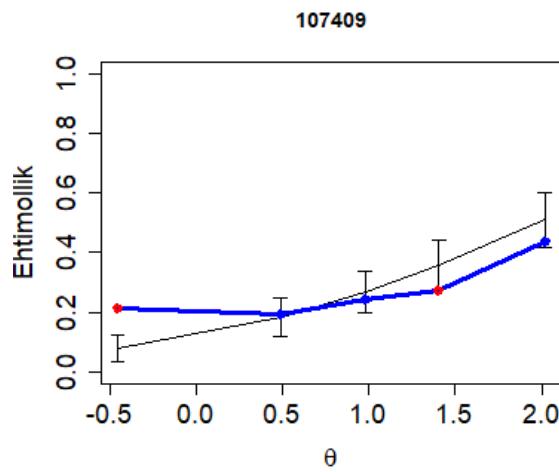












### 5c-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 3-test sinovi natijalarining Rash modeli bilan mosligi

6- rasmda geografiya fanidan o'tkazilgan 1-, 2- va 3- test sinovi natijalari bo'yicha test ma'lumoti chiziqlari (TMCh) keltirilgan.

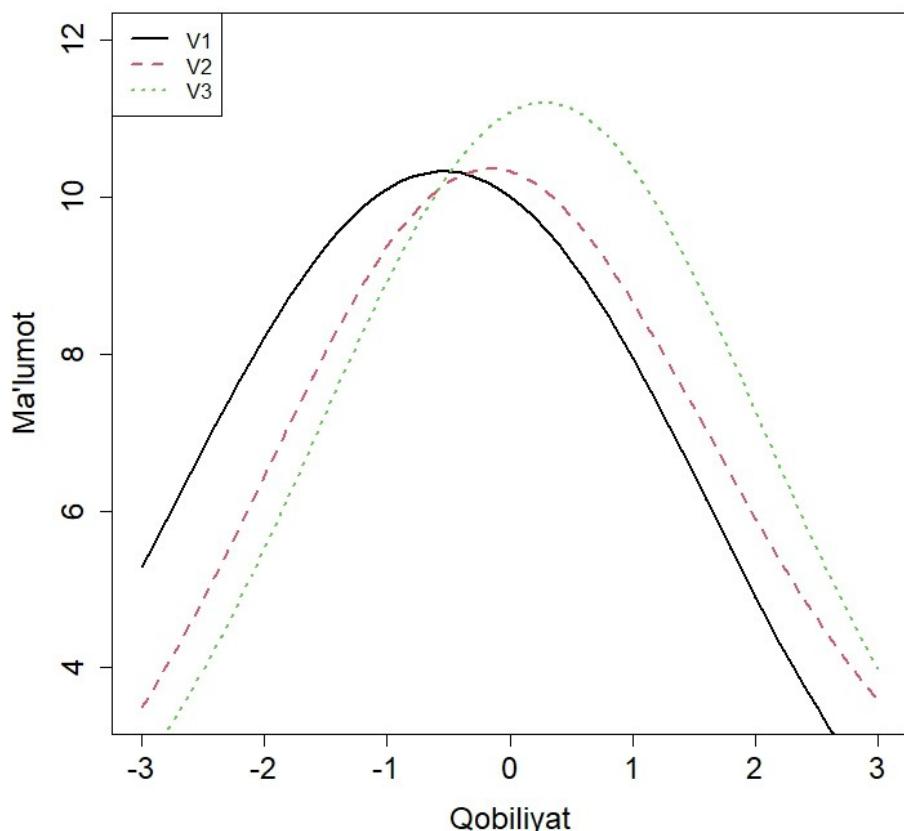
Test ma'lumoti chizig'i cho'qqisining nolga nisbatan chap tomonga biroz surilganligi ushbu test varianti qobiliyat darajasi past bo'lgan talabgorlar to'g'risida va aksincha, ma'lumot chizig'i cho'qqisining nolga nisbatan o'ng tomonga surilganligi ushbu test varianti qobiliyat darajasi yuqori bo'lgan talabgorlar to'g'risida

ko'proq ma'lumot beradi. Test ma'lumoti chizig'i cho'qqisi nol qiyatga to'g'ri kelishi yoki juda yaqinligi esa mazkur test varianti qobiliyat darajasi past va yuqori bo'lgan talabgorlar to'g'risida teng ma'lumot beradi.

5- rasmda ko'rsatilgan test ma'lumoti chiziqlariga ko'ra, geografiya fanidan o'tkazilgan 1- va 2-test sinovi natijalari ma'lumot chiziqlari cho'qqilarining nolga nisbatan chap tomonga (1- test sinovi

ko'proq, 2- test sinovi bo'yicha esa biroz) surilganligi ushbu test variantlari orqali qobiliyat darajasi past bo'lgan talabgorlar haqida ko'proq ma'lumot olinganligini bildiradi.

3- test sinovi ma'lumot chiziqlari cho'qqisining nolga nisbatan o'ng tomonga surilganligi esa, ushbu test varianti orqali qobiliyat darajasi yuqori bo'lgan talabgorlar haqida ko'proq ma'lumot olinganligini bildiradi.



#### 6-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-(V1), 2-(V2) va 3-(V3) test sinovi natijalarining test ma'lumoti chiziqlari

7-rasmda geografiya fanidan o'tkazilgan 1-, 2- va 3- test sinovlari natijalari bo'yicha test xarakteristikasi chiziqlari (TXCh) keltirilgan.

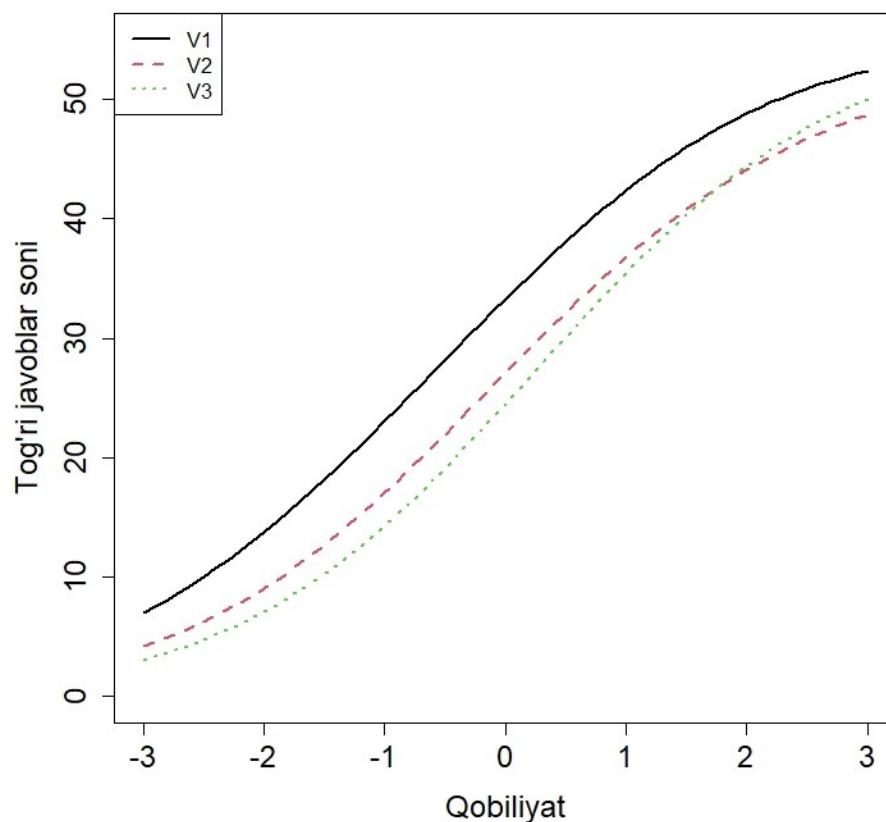
7-rasmdagi test xarakteristikasi chizig'idan to'g'ri javoblar sonining qobiliyat darajalari oshishi bilan ortib borishi ko'rindi.

Test xarakteristikasi chizig'idan 1-test sinovida ishlatilgan umumiyl elementli test varianti (V1) va 2-test sinovida foydalanilgan umumiyl elementli test varianti (V2) hamda 3-test sinovida ishlatilgan umumiyl elementli test varianti (V3) ning qiyinlik darajalarini bir-biri bilan

solishtirish mumkin. Bunga ko'ra, 1-test sinovida ishlatilgan umumiy elementli test varianti (V1) 2- va 3-test sinovi ishlatilgan umumiy elementli test varianti (V2, V3) ga nisbatan osonroq, 3-test sinovida ishlatilgan umumiy elementli test varianti (V3) esa 1-test va 2-test sinovida foydalanilgan umumiy elementli test varianti (V1, V2) ga nisbatan qiyinroq ekanligi ko'rindi.

7-rasmdan har bir variantning qiyinlik darajalari hisobga olingan

holda qobiliyatlar aniqlayotganligini ko'rish mumkin. Bu esa variantlarni qiyinligini hisobga olgan holda talabgorlarning qobiliyatlarni aniqlashda Rash modelini klassik test nazariyasiga nisbatan afzalligini bildiradi. Biroq, klassik test nazariyasi tahlil xulosalarini yanada to'ldirishini yodda tutish lozim. Shuning uchun ham odatda, test topshiriqlarining klassik test nazariyasi bilan aniqlangan xususiyatlari Rash modeli natijalari bilan birlgilikda beriladi.



### **7-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-(V1), 2-(V2) va 3-(V3) test sinovi natijalarining test xarakteristikasi chiziqlari**

Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3-test sinovlarida foydalanilgan test topshiriqlarining ishonchlilik koeffitsiyenti (Kronbax alfa koeffitsiyenti) mos ravishda 0,84; 0,84 va 0,87 ga teng ekanligi, ishonchlilik koeffitsiyentiga qo'yilgan mezon bo'yicha test topshiriqlarining o'zaro ichki muvofiqligi har uchchala test sinovi bo'yicha "yaxshi" darajada ekanligi aniqlandi.

Har bitta test topshirig'i bilan umumiy ball korrelyatsiya koeffitsiyenti qiymatlari 1- va 3-qiyinlik darajasidagi test topshiriqlari uchun 0,25 dan kichik bo'lgan test topshiriqlarini o'rganib chiqib kerakli o'zgarishlar qilish, lozim bo'lsa variantdan chiqarib tashlash maqsadga muvofiq bo'ladi. Har bitta test topshirig'i bilan umumiy ball korrelyatsiya koeffitsiyenti qiymatlari 2- qiyinlik darajasidagi test topshiriqlari uchun 0,5 dan kichik bo'lgan test topshiriqlari esa, o'rganib chiqilib qiyinlik darajalarini hisobga olgan holda kerakli o'zgarishlar qilish test topshiriqlarining sifatini yaxshilash uchun xizmat qiladi.

Qiyinlik darajasi bo'yicha (-3:3) logit birligi oralig'idan tashqarida joylashgan test topshiriqlaridan kam miqdorda ma'lumot olinishi sababli bunday test topshiriqlarining o'rniga

(-3:3) logit birligi oralig'iga to'g'ri keladigan qiyinlikdagi test topshiriqlaridan qo'yish maqsadga muvofiq. Biroq, bunday test topshiriqlari agarda talabgorlar orasida shu test topshiriqlariga mos qobiliyatli talabgorlar bo'lsa, shunday test topshiriqlarining mavjudligi shu qobiliyatli talabgorlar to'g'risida ma'lumot beradi. Aks holda qiyinlik darajasi juda past va juda yuqori bo'lgan test topshiriqlarini o'rniga (-3:3) logit birligi atrofidagi test topshiriqlaridan kiritish, yuqori va past qobiliyat darajalaridan olinadigan ma'lumot miqdori orasidagi tafovutni yanada kamaytirish imkonini beradi.

Test topshiriqlari xususiyatlarini Rash modeliga moslashtirish muammoli elementlarni va o'ziga xos xususiyatlarga ega bo'lgan qobiliyatlarni ajratish imkonini beradi. Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovlarida foydalanilgan test variantlarida 1- test sinovi bo'yicha (ID raqamlari - 101155, 101166, 101412 va 101590) bo'lgan, 2- test sinovi bo'yicha (ID raqamlari - 107322 va 11447434) bo'lgan va 3- test sinovi bo'yicha (ID raqamlari - 107402 va 112560) bo'lgan test topshiriqlarining Rash modeli bilan moslik darajasi mos tushmaganligi, ya'ni ajratilgan qobiliyat guruhlarining barchasi bilan mos tushmaganligi

aniqlandi. Bunday test topshiriqlarini ham kalibirovkalangan test bazasiga jamlashdan avval mutaxassislar

tomonidan qayta ko'rib chiqilishi lozim.

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## TEST CHARACTERISTICS: TESTS ON GEOGRAPHY

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**Abstract.** This article analyzes the results on the geography tests conducted in 2024 for the national certification based on Classical Test Theory (CTT) and the Rasch model. The descriptive statistics of the test results and the correlation between individual test items and the total score are discussed. The difficulty levels of the test items used in three test administrations conducted using CTT and the Rasch model have been analyzed. Wright maps were generated for each test form based on the ability and difficulty levels identified using the Rasch model. Additionally, test data and characteristic curves, as well as the fit statistics of each test item within the test forms according to the Rasch model, were examined.

**Keywords:** Test items, Cronbach's alpha, difficulty, correlation coefficient, Rasch model, Wright-map, ability, fit to the Rasch model.