YUSUPOV A.E., KARIMOV A.A., JOVLIEV V.U.

AVTOMOBILLARDA TASHISH VA HARAKAT XAVFSIZLIGINI TASHKIL ETISH ASOSLARI

(II qism)

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O‘ZBEKISTON RESPUBLIKASI OLIY VA O‘RTA MAXSUS TA’LIM VAZIRLIGI

QARSHI MUHANDISLIK-IQTISODIYOT INSTITUTI

YUSUPOV A.E., KARIMOV A.A., JOVLIEV V.U.

AVTOMOBILLARDA TASHISH VA HARAKAT XAVFSIZLIGINI TASHKIL ETISH ASOSLARI

O‘zbekiston Respublikasi Oliy va o‘rta maxsus ta’lim vazirligi muvofiqlashtirish kengashi tomonidan oliy ta’lim muassasalari talabalariga o‘quv qo‘llanma sifatida tavsiya etilgan

A.E.Yusupov, A.A.Karimov, V.U.Jovliev. Avtomobillarda tashish va harakat xavfsizligini tashkil etish asoslari: Oliy ta’lim muassasalari talabalari uchun o’quv qo’llanma. O`zR Oliy va o`rta maxsus ta`lim vazirligi, 2020.- 121 bet.

Taqrizchilar:

Eshdavlatov E.U.- QMII “Yer usti transport tizimlari” kafedrasi dotsenti, t.f.n

Azimov N. Z. – Qashqadaryo avtoyo’l qurilish-ta’mirlash unitar korxonasi direktori o’rinbosari

O‘quv qo‘llanmada avtomobil transporti vositalari yuk va yo’lovchi tashish, harakat xavfsizligi tashkil etishga doir laboratoriya ishlari, ularni bajarilishiga namunalar va har talabalar mustaqil bajarishlari uchun variantlar keltirilgan.

O‘quv qo‘llanma bakalavriatning 5310600-“Yer usti transport tizimlari va ularning ekspluatatsiyasi” yo‘nalishi bo‘yicha ta’lim olayotgan talabalarga mo‘ljallangan.

Qarshi muhandislik iqtisodiyot instituti uslubiy kengashi tomonidan o’quv qo’llanma sifatida tavsiya etilgan

KIRISH

2017 yil 7 fevraldagi O’zbekiston Respublikasini yanada rivojlantirish bo’yicha Harakatlar strategiyasida transport infratuzilmasini rivojlantirish bo’yicha bir qancha rejalar ishlab chiqildi. Yuk va yo’lovchilarni tashishda zamonaviy transport vositalarini sotib olish, zamonaviy avtovokzallar qurish, yangidan yangi yo’nalishlar ochish hamda halqoro yuklarni tashish shular jumlasidandir. Hozirgi vaqt texnika va texnologiyalarni rivojlana borishi hamda harakat xavfsizligiga bo’lgan talabni oshib borishi zamon talabiga javob beradigan yuqori malakali mutaxassislar tayyorlashda “Yer usti transport tizimlari va ularning ekspluatatsiyasi” ta’lim yo’nalishining mutaxassislik fanlari orasida “Avtomobillarda tashish va harakat xavfsizligini tashkil etish asoslari” fani alohida o’rin tutadi. Chunki bu fanda avtomobillarda yuklarni tashish va ularni o’z vaqtida, sifati buzilmasdan iste’molchilarga yetkazish hamda avtomobillarda yo’lovchilrga sifatli xizmat ko’rsatib tashish asoslari o’rganiladi. Shuningdek, transportlarni va piyodalarni harakatlanish jarayonida harakat xavfsizligini ta’minlashning amaliy asoslari o’rganiladi.

Kundan kunga rivojlanib borayotgan texnika va texnologiyalarning taraqqiyoti talablari texnika fanlari, jumladan, avtomobillarda tashish va harakat xavfsizligini tashkil etish asoslari fanidan puxta bilimlarni talab qilmoqda. Yuk avtomobil transporti va yo’lovchi avtomobil transporti iqtisodiyotning muhim tarmoqlaridan biri hisoblanadi. Transportning ahamiyati yuklarni ishlab chiqarish joyidan iste’mol joyigacha bo’lgan harakatidagi zarurati orqali aniqlanadi. Iqtisodiy ma’nosi bo’yicha mahsulotning egasiga ya’ni iste’molchiga yetkazilmasa to’liq tayyor hisoblanmaydi. Shuning uchun transportning roli ishlab chiqarilgan mahsulotning iste’mol qiymatini ishlab chiqarish jarayonida saqlanishida o’z nihoyasiga yetadi.

Transportning yaxshi ishlashini belgilovchi muhim omillardan biri, uning yuk va yo’lovchilarni tashish muntazamligi va harakat xavfsizligini ta’minlanganligidir. Talabalar bu o’quv qullanma orqali laboratoriya mashg’ulotlarini masofoviy ta’lim olish orqali ham to’liq o’zlashtirib oladilar.

1-Laboratoriya ishi

MAVZU: TRANSPORT VOSITALARI EKSPLUATATSION XUSUSIYATLARI

Ishning maqsadi: Transport vositalari ekspluatation xususiyatlarini (yuk ko‘tarish qobiliyatiga ko‘ra) o‘rganish va uni tahlil qilish.

Ishni bajarish tartibi:

1.Transport vositalarini yuk ko‘ratish qobiliyatiga ko‘ra xususiyatlarini aniqlash.

2.Transport vositalari tavsifini keltirish.

Avtomobillarning asosiy ekspluatatsion xususiyatlariga quyidagilar kiradi: dinamikligi, yonilg’i iqtisodligi, boshqaruvchanligi, turg’unligi, o’tag’onligi, harakat ravonligi, sig’dira olishligi, mustahkamligi, chidamliligi, texnik xizmat ko’rsatish va tamirlashga mosligi, ortish-tushirish ishlarini bajarishga mosligi.

Yuk tashish bilan bog’liq sig’dira olish xususiyati avtomobilning hajmiy yuk ko’tarish qobiliyati, kuzov ost sathining 1m^2 yuzasiga to’g’ri keluvchi yuk ko’tarish qobiliyati, avtomobil massasidan foydalanish koeffitsienti va boshqa parametrlar orqali aniqlanadi.

Kuzovning hajmiy yuk ko’tarish qobiliyati kuzovning 1 m^3 hajmiga qancha yuk ko’tarish qobiliyati to’g’ri kelishini bildiradi.

Kuzovning hajmiy yuk ko’tarish qobiliyati quyidagi formulalar orqali aniqlanadi:

1. bortli avtomobillar uchun:

$$q_h = q_n / V_к = q_n / (a_к \cdot в_к \cdot h); \quad \text{t/m}^3$$

2. samosval avtomobillar uchun:

$$q_h = q_н / V_к = q_n / [a_к \cdot в_к (h - h_{sh})]; \quad \text{t/m}^3$$

1 m^2 kuzov maydoniga to‘g‘ri keluvchi yuk ko‘taruvchanlik

$$q_s = q_n / (a_к \cdot в_к); \quad \text{t/m}^2$$

Avtomobil massasidan foydalanish koeffitsiyenti

$$h_q = G_o / q_n$$

bu yerda: a_k – kuzov uzunligi, m;

v_k - kuzovning kengligi, m;

h - kuzov bortining balandligi, m;

h_{sh}- bort platformasidan yukning eng yuqori qismigacha bo‘lgan balandligi, m;

G_o- avtomobilning o‘z og‘irligi, t;

q_n - avtomobilning nominal yuk ko‘tarish qobiliyati, t.

LABORATORIYA ISHINI BAJARISHGA NAMUNA

Ushbu laboratoriya ishi bajarish uchun Kamaz 5511 samasval avtomobilini yuk ko’tarish qobiliyatiga ko’ra taxlil qilamiz.

Berilgan: q_n=10 t, G_o=8t, a=5m, b=2,4m, h=1m;

Kuzovning hajmiy yuk ko‘tarish qobiliyatini aniqlash.

Biz ushbu laboratoriya ishi bajarish uchun Kamaz 5511 samasval avtomobilini yuk ko’tarish qobiliyatiga ko’ra taxlil qilishimizda 2-formuladan foydalanamiz.

1. bortli avtomobillar uchun:

$$q_h = q_n / V_к = q_n / (a_к \cdot в_к \cdot h); \quad \text{t/m}^3$$

2. samosval avtomobillar uchun:

$$q_h = \frac{q_n}{V_к} = \frac{q_n}{[a_к \cdot в_к (h - h_1)]} = \frac{10}{5 * 2{,}4 \mid (1 - 0{,}1)} = 0{,}92 \quad t/m^3;$$

1 m^2 kuzov maydoniga to‘g‘ri keluvchi yuk ko‘taruvchanlik

$$q_s = \frac{q_n}{(a_к \cdot в_к)} = \frac{10}{5 * 2{,}4} = \frac{10}{12} = 0{,}83 \ t/m^2;$$

Avtomobil massasidan foydalanish koeffitsiyenti

$$h_q = \frac{G_o}{q_n} = \frac{8}{10} = 0{,}8$$

2 – Laboratoriya ishi

MAVZU: YUK TASHISH MARSHRUTLARINI TUZISH

Ishning maqsadi: Avtotransport korxonasi joylashuvini hisobga olgan holda yuk tashish marshrutlarini tuzish va uni tahlil qilish.

Ishni bajarish tartibi:

1. Shaxmat jadvalini tuzish.
2. Yuk oqimi sxemasini (epyurasi)ni qurish
3. Avtokorxona joylashuv punktini tanlash.
4. Yuk tashish marshrutlarini tuzish.

Yuk tashish obektlariga kon qazilmalari va mahsulotga kayta ishlov berish sanoatlari, qurilish va savdo tashkilotlari, boshqa har xil ishlab chiqarish hamda uy joy ro'zg'orlari kiradi. Yuk deyilganda tashish uchun qabul qilingandan to uni egasiga topshirilgungacha buyumlar tushuniladi. Yuklar ayni buyum (tovar) va taralardan iborat bo'lishi mumkin. Tashilgan yuklarning o'lchami faqatgina tonna o'lchamida bo'ladi. Boshqa o'lchamlar-litr, dona, kub metr kabilar-tonna o'lchamiga o'tkazilishi shart. Ko'pchilik yuklar tarasiz tashiladi va ularni tarasiz tashish deyiladi.

1. Shaxmat jadvalini tuzish

Topshiriq asosida shaxmat jadvali tuziladi. U yuk oqimlarini o‘rganish va avtoxo‘jalikni qaysi punktga joylashtirishni aniqlash uchun xizmat qiladi. Shaxmat jadvalining qatorlarida yuk jo‘natuvchilar va xuddi shu tartibda ustunlarda yuk qabul qilish punktlari joylashtiriladi. Har bir jo‘natuvchi va qabul qiluvchi bo‘yicha jami jo‘natilgan va qabul qilingan yuklar aniqlanadi. Shaxmat jadvalini tuzishda har xil sinfdagi yuklar birinchi sinfga keltiriladi. Buning uchun yuk hajmi shu yukning ko‘taruvchanlikdan foydalanish koeffitsiyentiga bo‘linadi:

$\gamma_{st1}=1,0$ $\gamma_{st2}=0,8$ $\gamma_{st3}=0,6$ $\gamma_{zz4}=0,5$

Yuk jo‘natish punktlari	Yuk qabul qilish punktlari va yuk miqdori, ming t.				Jami
	A	B	V	G	
A					
B					
V					
G					
Jami					

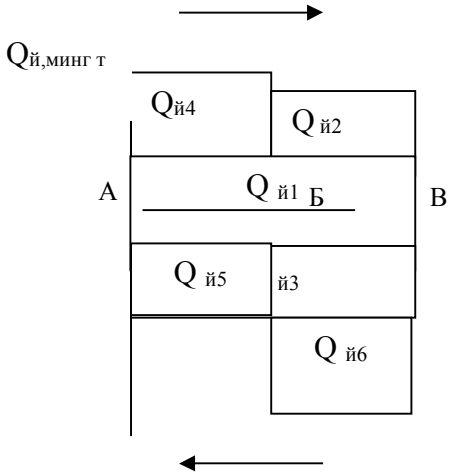
2. Yuk oqimi sxemasini (epyurasi) ni qurish

Yuk oqimlari sxema yoki epyura ko‘rinishida tasvirlanishi mumkin. Agar yuklarni yig‘uvchi va tarqatuvchi punktlar bir chiziq ustida yotsa "yuk-masofa" koordinatalarida epyura quriladi, bunda Q_{yil} ordinata o‘qida, *l* absissa o‘qida ko‘rsatiladi.

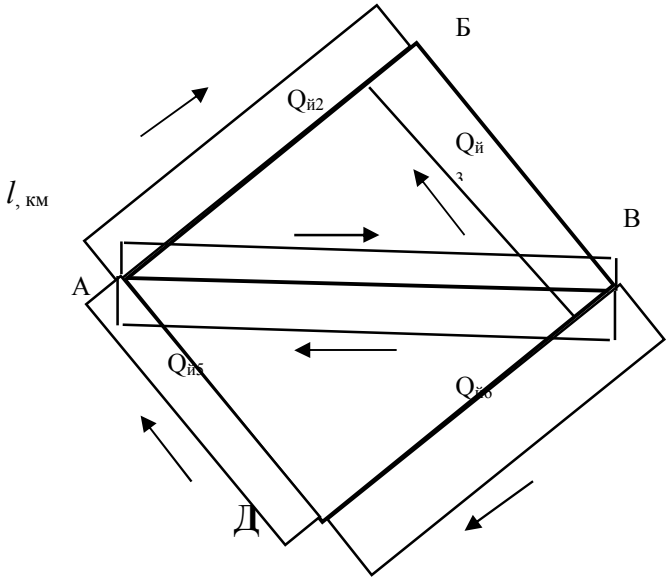
Agar yuk jo‘natuvchi va qabul qiluvchi punktlar bir chiziqda yotmasa, u holda yo‘l tarmog‘i chizmasi ustiga yuk oqimi sxemasi chiziladi.

Epyura va sxema masshtab asosida quriladi. Epyura yoki sxemadagi har bir to‘g‘ri to‘rtburchakning yuzasi shu uchastkadagi tonna-kilometr hisobidagi yuk oborotini ko‘rsatadi, uning hamma maydoni esa tashish amalga oshirilayotgan butun liniyaning yuk oborotini ko‘rsatad

Yuk oqimi epyurasi



Yuk oqimi sxemasi



3. Avtokorxona joylashuv punktini tanlash

Avtokorxonani shunday joylashtirish kerakki, bunda nolinchi qatnov masofasi, ya'ni avtokorxonadan birinchi yuk ortish punktigacha va oxirgi yuk qabul qilish punktidan avtosaroygacha bo‘lgan masofa qisqa bo‘lib, masofadan foydalanish koeffitsiyentini oshirish imkoniyatiga ega bo‘linsin.

Avtokorxona shaxmat jadvalini tahlil qilish natijasida aniqlanadi. Bunda har bir punkt bo‘yicha yuk jo‘natish va qabul qilish yillik yuk tashish hajmlari qo‘shib chiqiladi. Yuk tashish hajmi katta bo‘lgan punktda avtosaroyni joylashtirish lozim.

T/R	Punktlar	Jo‘natadi, Ming t	Qabul qiladi, ming t	Jami, ming t
1.	A			
2.	B			
3.	V			
4.	G			

4.Yuk tashish marshrutlarini tuzish

Yuk tashish marshrutlarini tuzish deganda ish unumi yuqori, tashish tannarxi past va masofadan foydalanish koeffitsiyenti 0,5dan katta ($\beta>0,5$) marshrut tushuniladi.

Harakat marshrutlarini tanlashda tashish masofasi, transport vositasi turi va avtomobillarning har ikki tomonga iloji boricha yuk bilan qatnashini ta'minlash e'tiborga olinadi.

Har bir marshrutning sxemasi chizilib, unda yukning nomi va hajmi, punktlar orasidagi masofalar ko‘rsatiladi.

IKKINCHI LABORATORIYA ISHIINI BAJARISHGA NAMUNA

Ishni bajarish tartibi:

1.Shaxmat jadvalini tuzish.

2.Yuk oqimi sxemasini (epyurasi)ni qurish

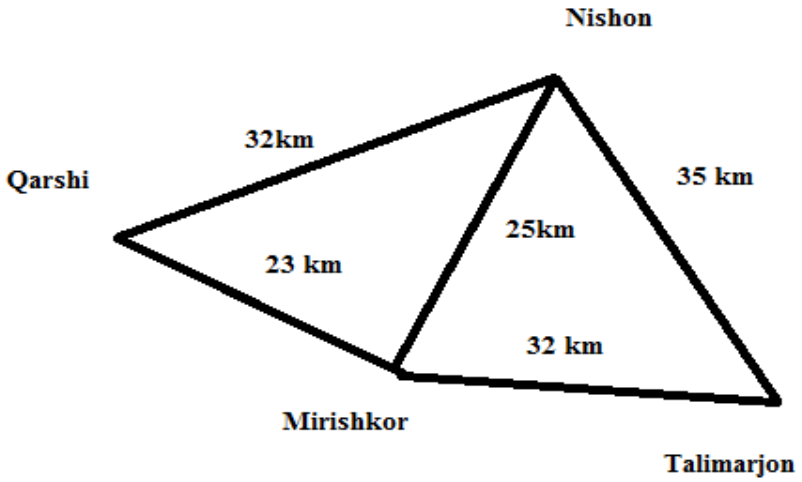
3.Avtokorxona joylashuv punktini tanlash.

4.Yuk tashish marshrutlarini tuzish.

Topshiriq: Variant №28 Berilgan: T_{ish}=8 soat, D_{yil}=305 kun, $\alpha_{ish} = 0,8$

Yunalish chizmasi

T/ R	Jo'natuvchi	Qabul qiluvchi	Yukning nomi	Yuk hajmi	Yuk sinfi
1	Qarshi	Nishon	Gazlama	270	1
2	Mirishkor	Qarshi	Metall	180	1
3	Nishon	Talimarjon	Xo'l meva	200	1
4	Talimarjon	Mirishkor	Sabzavot	200	2
5	Mirishkor	Nishon	Kir yuvuvchi mashina	150	3
6	Qarshi	Talimarjon	Kanserva	150	1



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qabul qilish punktlari joylashtiriladi. Har bir jo‘natuvchi va qabul qiluvchi bo‘yicha jami jo‘natilgan va qabul qilingan yuklar aniqlanadi. Shaxmat jadvalini tuzishda har xil sinfdagi yuklar birinchi sinfga keltiriladi. Buning uchun yuk hajmi shu yukning ko‘taruvchanlikdan foydalanish koeffitsiyentiga bo‘linadi:

$\gamma_{st1}=1,0$ $\gamma_{st2}=0,8$ $\gamma_{st3}=0,6$ $\gamma_{zz4}=0,5$

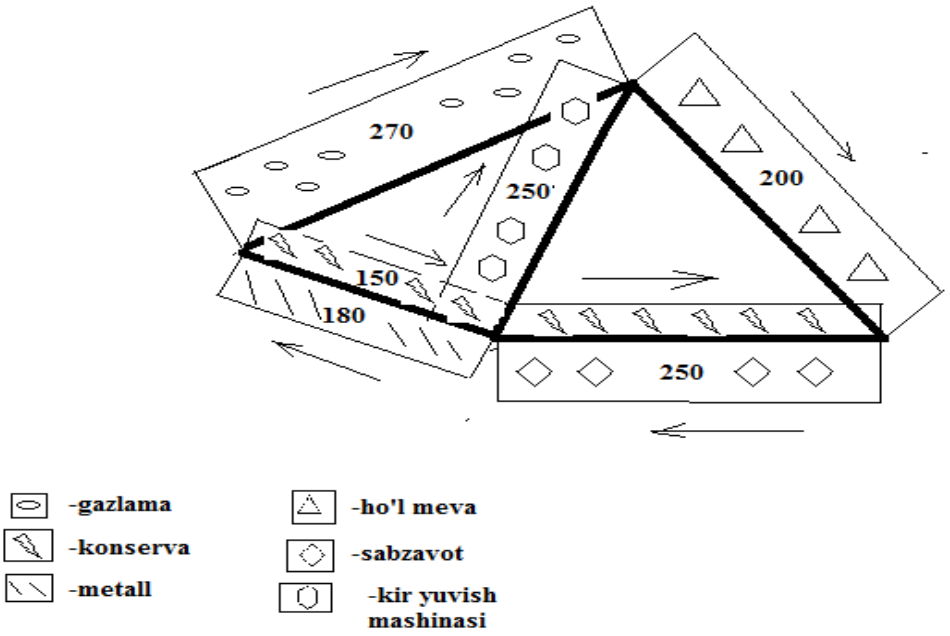
Yuk jo‘natish punktlari		Yuk qabul qilish punktlari va yuk miqdori, ming t.				Jami
		Qarshi	Mirishkor	Nishon	Talimarjon	
Qarshi				270	150	420
Mirishkor		180		150/0,6=250		430
Nishon					200	200
Talimarjon			200/0,8=250			250
Jami		180	250	520	350	1300

2. Yuk oqimi sxemasini (epyurasi) ni qurish

Yuk oqimlari sxema yoki epyura ko‘rinishida tasvirlanishi mumkin. Agar yuklarni yig‘uvchi va tarqatuvchi punktlar bir chiziq ustida yotsa "yuk-masofa" koordinatalarida epyura quriladi, bunda Q_{yil} ordinata o‘qida, *l* absissa o‘qida ko‘rsatiladi.

Agar yuk jo‘natuvchi va qabul qiluvchi punktlar bir chiziqda yotmasa, u holda yo‘l tarmog‘i chizmasi ustiga yuk oqimi sxemasi chiziladi.

Epyura va sxema masshtab asosida quriladi. Epyura yoki sxemadagi har bir to‘g‘ri to‘rtburchakning yuzasi shu uchastkadagi tonna-kilometr hisobidagi yuk oborotini ko‘rsatadi, uning hamma maydoni esa tashish amalga oshirilayotgan butun liniyaning yuk oborotini ko‘rsatadi. Ushbu variant bo’yicha yuk oqimi sxemasi quruladi.



3.Avtokorxona joylashuv punktini tanlash

Avtokorxonani shunday joylashtirish kerakki, bunda nolinchi qatnov masofasi, ya'ni avtokorxonadan birinchi yuk ortish punktigacha va oxirgi yuk qabul qilish punktidan avtosaroygacha bo'lgan masofa qisqa bo'lib, masofadan foydalanish koeffitsiyentini oshirish imkoniyatiga ega bo'linsin.

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Nolinchi qatnov masofasi 2…4 km masofa oralig'ida tanlanadi.

T/R	Punktlar	Jo'natadi, Ming t	Qabul qiladi, ming t	Jami, ming t
1.	Qarshi	420	180	600
2.	Mirishkor	430	250	680
3.	Nishon	200	520	720
4.	Talimarjon	250	350	600

Bundan kurinib turibdiki eng ko'p yuk Nishonda bo'lgani uchun avtokarxonani Nishondan tanlab olamiz.

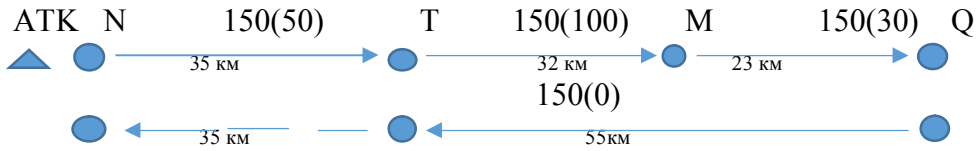
4. Yuk tashish marshrutlarini tuzish

Yuk tashish marshrutlarini tuzish deganda ish unumi yuqori, tashish tannarxi past va masofadan foydalanish koeffitsiyenti 0,5dan katta (β>0,5) marshrut tushuniladi.

Harakat marshrutlarini tanlashda tashish masofasi, transport vositasi turi va avtomobillarning har ikki tomonga iloji boricha yuk bilan qatnashini ta'minlash e'tiborga olinadi.

Har bir marshrutning sxemasi chizilib, unda yukning nomi va hajmi, punktlar orasidagi masofalar ko'rsatiladi.

1-marshrut



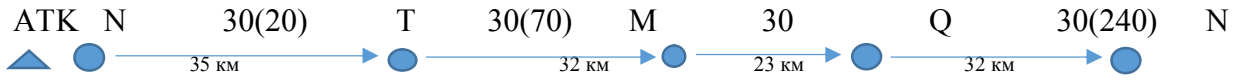
1) $L_{yuk\ o'rt} = \frac{\sum L_{yuk}}{n} = \frac{145}{4} = 36{,}3\ km$

2) $\beta = \frac{\sum L_{yuk}}{\sum L_{um}} = \frac{145}{180} = 0{,}8$

3) $\gamma_{st} = \frac{\sum \gamma_{st}}{n} = \frac{1+0{,}8+1+1}{4} = \frac{3{,}8}{4} = 0{,}95$

4) $Q_y = \sum Q \times \gamma_{st} = 150*1 + 150*0{,}8 + 150*1 + 150*1 = 570\ ming\ tonn$

2-marshrut



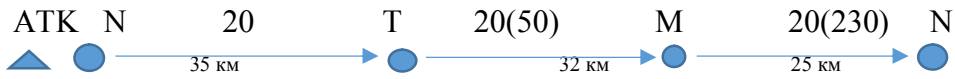
1) $\frac{\sum L_{yuk}}{n} = \frac{122}{4} = 30{,}5\ km$

2) $\beta = \frac{\sum L_{yuk}}{\sum L_{um}} = \frac{122}{122} = 1$

3) $\gamma_{st} = \frac{\sum \gamma_{st}}{n} = \frac{1+0{,}8+1+1}{4} = \frac{3{,}8}{4} = 0{,}95$

4) $Q_y = \sum Q \times \gamma_{st} = 30*1 + 30*0{,}8 + 30*1 + 30*1 = 114\ ming\ tonna$

3-marshrut



1) $\frac{\Sigma L_{yuk}}{n} = \frac{92}{3} = 30{,}6\ km$

2) $\beta = \frac{\Sigma L_{yuk}}{\Sigma L_{um}} = \frac{92}{92} = 1$

3) $\gamma_{st} = \frac{\Sigma \gamma_{st}}{n} = \frac{1+0{,}8+0{,}6}{3} = \frac{2{,}4}{3} = 0{,}8$

4) $Q_y = \Sigma Q \times \gamma_{st} = 20*1 + 20*0{,}8 + 20*0{,}6 = 48\ ming\ tonna$

4-marshrut

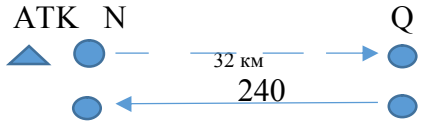
1) $\frac{\Sigma L_{yuk}}{n} = \frac{57}{2} = 28{,}5\ km$

2) $\beta = \frac{\Sigma L_{yuk}}{\Sigma L_{um}} = \frac{57}{92} = 0{,}6$

3) $\gamma_{st} = \frac{\Sigma \gamma_{st}}{n} = \frac{0{,}8+0{,}6}{2} = \frac{1{,}4}{2} = 0{,}7$

4) $Q_y = \Sigma Q \times \gamma_{st} = 50*0{,}8 + 50*0{,}6 = 70\ ming\ tonna$

5-marshrut



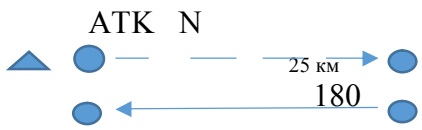
1) $\frac{\Sigma L_{yuk}}{n} = \frac{32}{1} = 32\ km$

2) $\beta = \frac{\Sigma L_{yuk}}{\Sigma L_{um}} = \frac{32}{64} = 0{,}5$

3) $\gamma_{st} = \frac{\Sigma \gamma_{st}}{n} = \frac{1}{1} = 1$

4) $Q_y = \Sigma Q \times \gamma_{st} = 240*1 = 240\ ming\ tonna$

6-marshrut



1) $\frac{\sum L_{yuk}}{n} = \frac{25}{1} = 25\ km$

2) $\beta = \frac{\sum L_{yuk}}{\sum L_{um}} = \frac{25}{50} = 0{,}5$

3) $\gamma_{st} = \frac{\sum \gamma_{st}}{n} = \frac{0{,}6}{1} = 0{,}6$

4) $Q_y = \sum Q \times \gamma_{st} = 180 * 0{,}6 = 108\ ming\ tonna$

Marshrutlar bo'yicha hisob kitobdan ko'rinib to'ribdiki bo'sh qatnov qancha kam bo'lsa ish unumdorligi shuncha ko'p bo'ladi va xarajatlar kamayadi.

3 – Laboratoriya ishi

MAVZU: TRANSPORT VOSITASI UNUMIGA TEXNIK-EKSPLUATATSION KO‘RSATKICHLAR TA’SIRI

Ishning maqsadi: Transport vositasi kunlik unumiga ta’sir etuvchi omillarni o‘rganish va uni tahlil qilish

Ishni bajarish tartibi:

1. Texnik-ekspluatatsion ko‘rsatkichlarning transport vositasi unumiga ta’sirini hisoblash.
2. Hisob natijalarini grafik ko‘rinishida tasvirlash va ularni tahlil qilish.

Transport vositasi kunlik unumi quyidagi formulalar orqali aniqlanadi:

$$Q_k = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}}; \quad \text{t}$$

$$P_k = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}}; \quad \text{tkm}$$

bu yerda:

T_{ish} – transport vositasi ish vaqti, soat;

q_n - transport vositasi nominal yuk ko‘tarish qobiliyati, t;

γ_{st} - yuk ko‘tarish qobiliyatidan foydalanish statik koeffitsiyenti;

β - bosib o‘tilgan masofadan foydalanish koeffitsiyenti;

V_t - o‘rtacha texnik tezlik, km/soat;

t_{o-t} - yuk ortish-tushirish vaqti, soat;

l_{yuk}- yukli qatnov masofasi, km.

Topshiriq T/R

Avtomobil rusumi	T_{ish}, soat	V_t, km/soat	β	γ_{st}	to-t , soat	q_n , t

a) yukli qatnov masofasi o‘zgarishining transport vositasi kunlik unumiga ta’siri (t, tkm)

Transport vositasi unumi	l_{yuq}, km						
	5	10	20	30	40	50	60
Q_k, t							
R_k, tkm							

b) texnik tezlik o‘zgarishining transport vositasi kunlik unumiga ta’siri (tkm)

l_{yuq}, km	V_t, km/soat						
	20	25	30	35	40	45	50
5							
30							
60							

Topshiriqda berilgan V_t ning kiymati o‘rniga jadvalda ko‘rsatilgan 20,25,...,50 km/soat tezliklar uchun P_k hisoblanadi

v) masofadan foydalanish koeffitsiyenti o‘zgarishining transport vositasi kunlik unumiga ta’siri (tkm)

l_{yuq}, km	β						
	0,4	0,5	0,6	0,7	0,8	0,9	1
5							
30							
60							

Topshiriqda berilgan β ning qiymati o‘rniga jadvalda ko‘rsatilgan 0,4; 0,5;...; 1,0 qiymatlar uchun P_k hisoblanadi.

g) yuk ko‘taruvchanlikdan statik foydalanish koeffitsiyenti o‘zgarishining kunlik ish unumiga ta’siri (tkm)

l_{yuq}, km	γ						
	0,4	0,5	0,6	0,7	0,8	0,9	1
5							
30							
60							

Topshiriqda berilgan γ_{st} ning qiymati o‘rniga jadvalda ko‘rsatilgan 0,4; 0,5;...; 1,0 qiymatlar uchun P_k hisoblanadi

d) yuk ortish-tushirish vaqti o‘zgarishining kunlik ish unumiga ta’siri (tkm)

l_{yuq}, km	t_{O-T}, s						
	0,1	0,3	0,5	0,7	0,8	1	1,2
5							
30							
60							

Topshiriqda berilgan t_{o-t} ning qiymati o‘rniga jadvalda ko‘rsatilgan 0,1; 0,3;...; 1,2 soat qiymatlar uchun P_k hisoblanadi.

ye) ish vaqti o‘zgarishining kunlik ish unumiga ta’siri (tkm)

l_{yuq}, km	T_{ISH}, soat						
	6	7	8	9	10	11	12
5							
30							
60							

Topshiriqda berilgan T_{ish} ning qiymati o‘rniga jadvalda ko‘rsatilgan 6,7,...,12 soat qiymatlar uchun P_k hisoblanadi.

yo) taransport vositasi yuk ko‘taruvchanligi o‘zgarishining kunlik ish unumiga ta’siri (tkm)

l_{yuq}, km	q_n, t						
	1	3	5	7	9	11	13
5							
30							
60							

Topshiriqda berilgan q_i ning qiymati o‘rniga jadvalda ko‘rsatilgan 1,3,...,13 t qiymatlar uchun P_k hisoblanadi.

UCHUNCHI LABORATORIYA ISHIGA NAMUNA

Berilgan

Topshiriq T/R

Avtomobil rusumi	T_{ish}, soat	V_t, km/soat	β	γ_{st}	to-t, soat	q_n, t
MAN CLA 26.280	10,5	40	0,9	0,8	1,0	26,0

a) yukli qatnov masofasi o‘zgarishining transport vositasi kunlik unumiga ta’siri (t, tkm)

Topshiriqda berilgan l_{yuq} ning kiymati o‘rniga jadvalda ko‘rsatilgan 5,10,...,60 km masofa uchun Q_k va P_k hisoblanadi

$$Q_{k5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{5+36} = 191{,}7 \ \ t$$

$$Q_{k10} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{10 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{10+36} = 170{,}9 \ \ t$$

$$Q_{k20} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{20+36} = 140.4 \ \ t$$

$$Q_{k30} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{30+36} = 119.1 \ \ t$$

$$Q_{k40} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{40 + 36} = 103.5 \quad t$$

$$Q_{k50} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{50 + 36} = 91{,}4 \quad t$$

$$Q_{k60} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40}{5 + 0{,}9 \times 40 \times 1} = \frac{7862{,}4}{60 + 36} = 81{,}9 \quad t$$

$$P_{k5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 191{,}7 \times 5 = 958{,}5 \quad tkm$$

$$P_{k10} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 170.9 \times 10 = 1709 \quad tkm$$

$$P_{k20} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 140{,}4 \times 20 = 2808 \quad tkm$$

$$P_{k30} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 119{,}1 \times 30 = 3573 \quad tkm$$

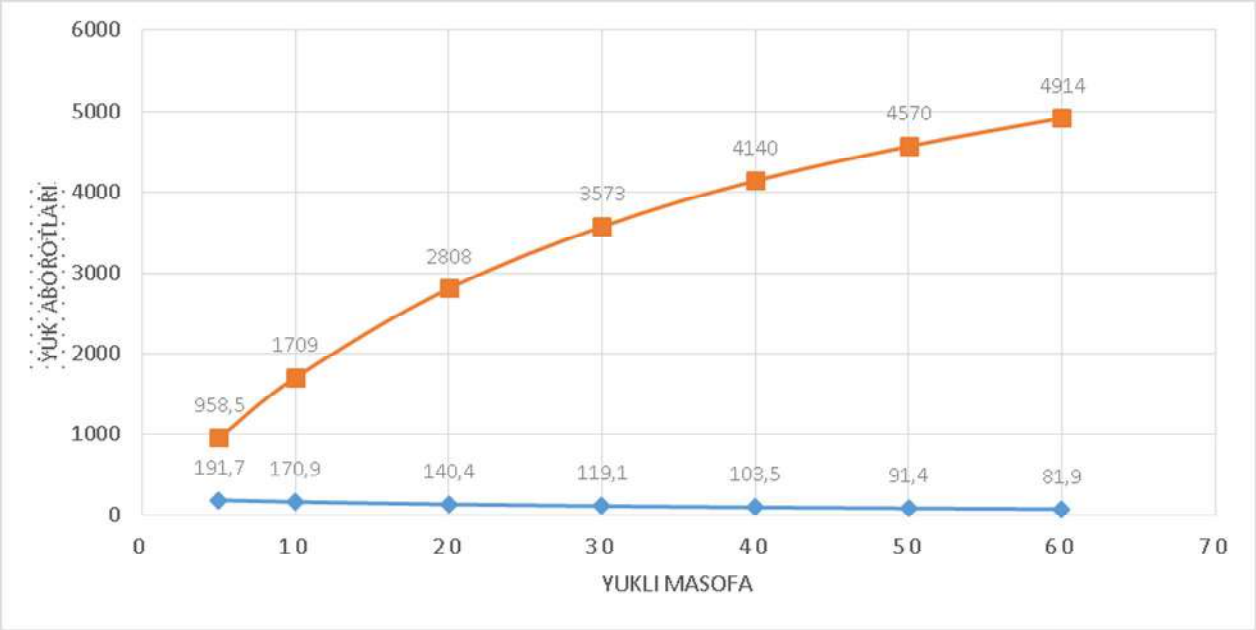
$$P_{k40} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 103{,}5 \times 40 = 4140 \quad tkm$$

$$P_{k50} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 91{,}4 \times 50 = 4570 \quad tkm$$

$$P_{k60} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} \times l_{yuk} = Q_K \times l_{yuk} = 81.9 \times 60 = 4914 \quad tkm$$

Transport vositasi unumi	l_{yuq}, km						
	5	10	20	30	40	50	60
Q_k, t	191,7	170,9	140,4	119,1	103,5	91,4	81,9
R_k, tkm	958,5	1709	2808	3573	4140	4570	4914

yukli qatnov masofasi o‘zgarishining transport vositasi kunlik unumiga ta’siri grafigi



Grafikdan ko'rinib turubdiki yuk tashish masofasi oshgan sari yuk hajmi kamayarkan yuk oboroti esa osharkan

b) texnik tezlik o'zgarishining transport vositasi kunlik unumiga ta'siri (tkm)

Topshiriqda berilgan V_t ning kiymati o'rniga jadvalda ko'rsatilgan 20,25,...,50 km/soat tezliklar uchun P_k hisoblanadi

$$P_{k5-20} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 20 \times 5}{5 + 0{,}9 \times 20 \times 1} = 854.6 \quad tkm$$

$$P_{k5-25} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 25 \times 5}{5 + 0{,}9 \times 25 \times 1} = 893.4 \quad tkm$$

$$P_{k5-30} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 30 \times 5}{5 + 0{,}9 \times 30 \times 1} = 921 \quad tkm$$

$$P_{k5-35} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 35 \times 5}{5 + 0{,}9 \times 35 \times 1} = 942 \quad tkm$$

$$P_{k5-40} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 958.8 \quad tkm$$

$$P_{k5-45} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 45 \times 5}{5 + 0{,}9 \times 45 \times 1} = 972 \quad tkm$$

$$P_{k5-50} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 50 \times 5}{5 + 0{,}9 \times 50 \times 1} = 982.8 \quad tkm$$

$$P_{k30-20} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 20 \times 30}{30 + 0{,}9 \times 20 \times 1} = 2457 \ \ tkm$$

$$P_{k30-25} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 25 \times 30}{30 + 0{,}9 \times 25 \times 1} = 2808 \ \ tkm$$

$$P_{k30-30} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 30 \times 30}{30 + 0{,}9 \times 30 \times 1} = 3104 \ \ tkm$$

$$P_{k30-35} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 35 \times 30}{30 + 0{,}9 \times 35 \times 1} = 3356 \ \ tkm$$

$$P_{k30-40} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 3574 \ \ tkm$$

$$P_{k30-45} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 45 \times 30}{30 + 0{,}9 \times 45 \times 1} = 3764 \ \ tkm$$

$$P_{k60-20} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 20 \times 60}{60 + 0{,}9 \times 20 \times 1} = 3024 \ \ tkm$$

$$P_{k60-25} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 25 \times 60}{60 + 0{,}9 \times 25 \times 1} = 3574 \ \ tkm$$

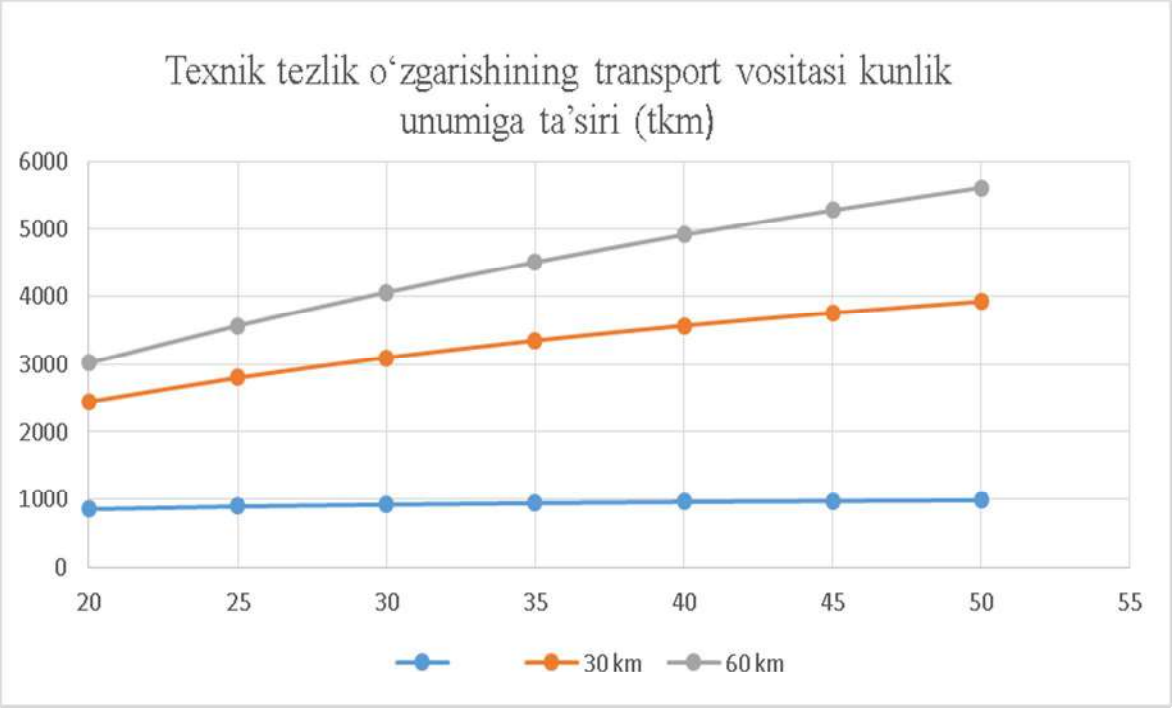
$$P_{k60-30} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 30 \times 60}{60 + 0{,}9 \times 30 \times 1} = 4067 \ \ tkm$$

$$P_{k60-35} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 35 \times 60}{60 + 0{,}9 \times 35 \times 1} = 4511 \ \ tkm$$

$$P_{k60-40} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4914 \ \ tkm$$

$$P_{k60-45} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 45 \times 60}{60 + 0{,}9 \times 45 \times 1} = 5281 \ \ tkm$$

l_{yuq}, km	V_t, km/soat						
	20	25	30	35	40	45	50
5	855	893	921	942	959	972	983
30	2457	2808	3104	3356	3574	3764	3931
60	3024	3574	4067	4511	4914	5281	5616



Grafikdan ko’rinib turubdiki tezlik oshgan sari transportning ish unumi ham oshar ekan.

v) masofadan foydalanish koeffitsiyenti o‘zgarishining transport vositasi kunlik unumiga ta’siri (tkm)

Topshiriqda berilgan β ning qiymati o‘rniga jadvalda ko‘rsatilgan 0,4; 0,5;...; 1,0 qiymatlar uchun P_k hisoblanadi.

$$P_{k\,5-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}4 \times 40 \times 5}{5 + 0{,}4 \times 40 \times 1} = 832 \quad tkm$$

$$P_{k\,5-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}5 \times 40 \times 5}{5 + 0{,}5 \times 40 \times 1} = 874 \quad tkm$$

$$P_{k\,5-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}6 \times 40 \times 5}{5 + 0{,}6 \times 40 \times 1} = 903 \quad tkm$$

$$P_{k\,5-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}7 \times 40 \times 5}{5 + 0{,}7 \times 40 \times 1} = 926 \quad tkm$$

$$P_{k\,5-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}8 \times 40 \times 5}{5 + 0{,}8 \times 40 \times 1} = 944 \quad tkm$$

$$P_{k5-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,9 \times 40 \times 5}{5 + 0,9 \times 40 \times 1} = 958 \quad tkm$$

$$P_{k5-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 1 \times 40 \times 5}{5 + 1 \times 40 \times 1} = 971 \quad tkm$$

$$P_{k30-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,4 \times 40 \times 30}{30 + 0,4 \times 40 \times 1} = 2279 \quad tkm$$

$$P_{k30-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,5 \times 40 \times 30}{30 + 0,5 \times 40 \times 1} = 2621 \quad tkm$$

$$P_{k30-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,6 \times 40 \times 30}{30 + 0,6 \times 40 \times 1} = 2912 \quad tkm$$

$$P_{k30-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,7 \times 40 \times 30}{30 + 0,7 \times 40 \times 1} = 3163 \quad tkm$$

$$P_{k30-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,8 \times 40 \times 30}{30 + 0,8 \times 40 \times 1} = 3382 \quad tkm$$

$$P_{k30-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,9 \times 40 \times 30}{30 + 0,9 \times 40 \times 1} = 3574 \quad tkm$$

$$P_{k30-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 1 \times 40 \times 30}{30 + 1 \times 40 \times 1} = 3744 \quad tkm$$

$$P_{k60-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,4 \times 40 \times 60}{60 + 0,4 \times 40 \times 1} = 2759 \quad tkm$$

$$P_{k60-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,5 \times 40 \times 60}{60 + 0,5 \times 40 \times 1} = 3276 \quad tkm$$

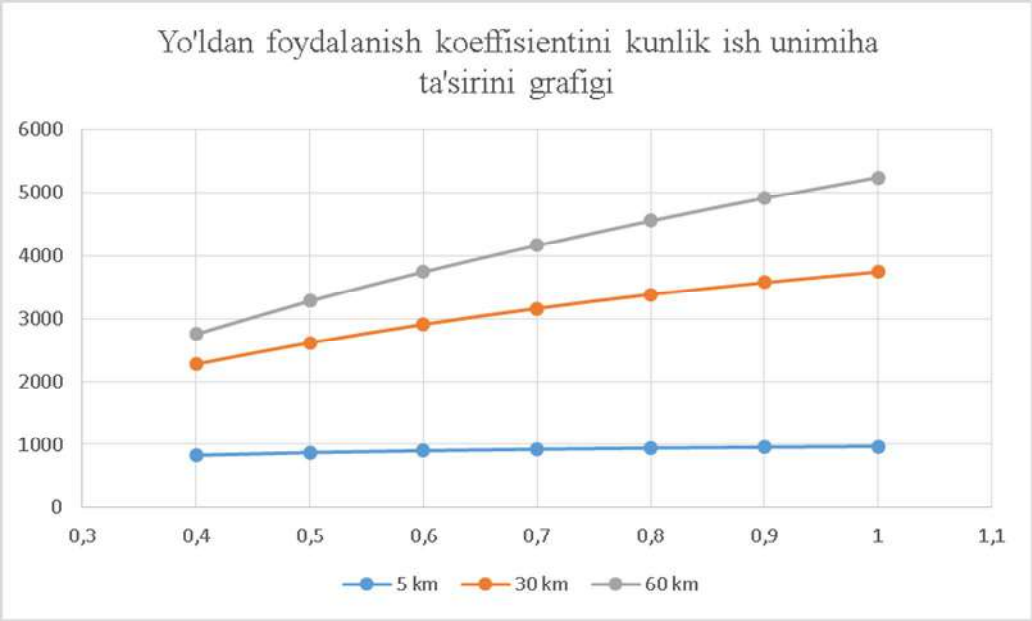
$$P_{k60-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,6 \times 40 \times 60}{60 + 0,6 \times 40 \times 1} = 3744 \quad tkm$$

$$P_{k60-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,8 \times 40 \times 60}{60 + 0,8 \times 40 \times 1} = 4558 \quad tkm$$

$$P_{k60-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 0,9 \times 40 \times 60}{60 + 0,9 \times 40 \times 1} = 4914 \quad tkm$$

$$P_{k60-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10,5 \times 26 \times 0,8 \times 1 \times 40 \times 60}{60 + 1 \times 40 \times 1} = 5242 \quad tkm$$

l_{yuq}, km	β						
	0,4	0,5	0,6	0,7	0,8	0,9	1
5	832	874	903	926	944	958	971
30	2279	2621	2912	3163	3382	3574	3744
60	2759	3276	3744	4169	4558	4914	5242



Grafikdan ko'rinib turubdiki masofadan foydalanish koeffitsiyenti qiymati oshgan sari transportning ish unumi ham oshar ekan.

g) yuk ko'taruvchanlikdan statik foydalanish koeffitsiyenti o'zgarishining kunlik ish unumiga ta'siri (tkm)

Topshiriqda berilgan γ_{st} ning qiymati o'rniga jadvalda ko'rsatilgan 0,4; 0,5;...; 1,0 qiymatlar uchun P_k hisoblanadi.

$$P_{k5-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}4 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 479 \quad tkm$$

$$P_{k5-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}5 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 599 \quad tkm$$

$$P_{k5-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}6 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 719 \quad tkm$$

$$P_{k5-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}7 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 839 \quad tkm$$

$$P_{k5-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 959 \quad tkm$$

$$P_{k5-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}9 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 1079 \quad tkm$$

$$P_{k5-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 1 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 1199 \quad tkm$$

$$P_{k30-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}4 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 1787 \quad tkm$$

$$P_{k30-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}5 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 2234 \quad tkm$$

$$P_{k30-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}6 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 2680 \quad tkm$$

$$P_{k30-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}7 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 3127 \quad tkm$$

$$P_{k30-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 3574 \quad tkm$$

$$P_{k30-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}9 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 4011 \quad tkm$$

$$P_{k30-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 1 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 4467 \quad tkm$$

$$P_{k60-0.4} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}4 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 2457 \quad tkm$$

$$P_{k60-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}5 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 3071 \quad tkm$$

$$P_{k60-0.6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}6 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 3686 \quad tkm$$

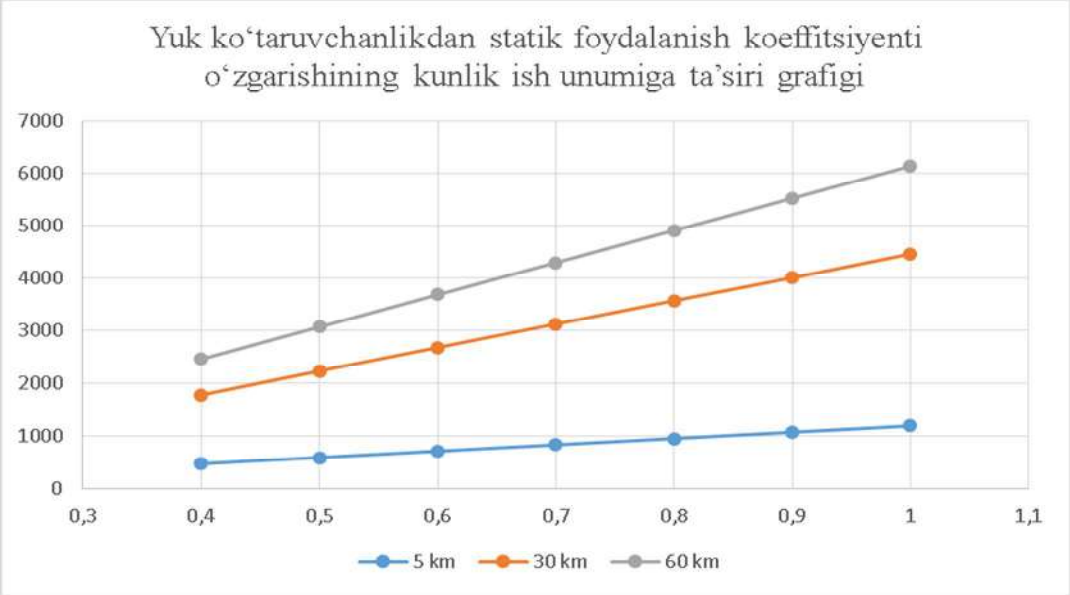
$$P_{k60-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}7 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4300 \quad tkm$$

$$P_{k60-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4914 \quad tkm$$

$$P_{k60-0.9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}9 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 5528 \quad tkm$$

$$P_{k60-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 1 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 6143 \quad tkm$$

l_{yuq}, km	γ						
	0,4	0,5	0,6	0,7	0,8	0,9	1
5	479	599	719	839	959	1079	1199
30	1787	2234	2680	3127	3574	4011	4467
60	2457	3071	3686	4300	4914	5528	6143



Grafikdan ko’rinib turubdiki yuk ko‘taruvchanlikdan statik foydalanish koeffitsiyenti qiymati oshgan sari transportning ish unumi ham oshar ekan.

d) yuk ortish-tushirish vaqti o‘zgarishining kunlik ish unumiga ta’siri (tkm)

Topshiriqda berilgan t_{o-t} ning qiymati o‘rniga jadvalda ko‘rsatilgan 0,1; 0,3;...; 1,2 soat qiymatlar uchun P_k hisoblanadi.

$$P_{k5-0.1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 0.1} = 4571 \quad tkm$$

$$P_{k5-0.3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 0.3} = 2488 \quad tkm$$

$$P_{k5-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 0.5} = 1709 \quad tkm$$

$$P_{k5-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 0.7} = 1302 \quad tkm$$

$$P_{k5-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 0.8} = 1163 \quad tkm$$

$$P_{k5-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 972 \quad tkm$$

$$P_{k5-1.2} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1.2} = 816 \quad tkm$$

$$P_{k30-0.1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 0.1} = 7020 \quad tkm$$

$$P_{k30-0.3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 0.3} = 5781 \quad tkm$$

$$P_{k30-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 0.5} = 4914 \quad tkm$$

$$P_{k30-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 0.7} = 4273 \quad tkm$$

$$P_{k30-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 0.8} = 4011 \quad tkm$$

$$P_{k30-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 3574 \quad tkm$$

$$P_{k30-1.2} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1.2} = 3222 \quad tkm$$

$$P_{k60-0.1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 0.1} = 7417 \quad tkm$$

$$P_{k60-0.3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 0.3} = 6663 \quad tkm$$

$$P_{k60-0.5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 0.5} = 6048 \quad tkm$$

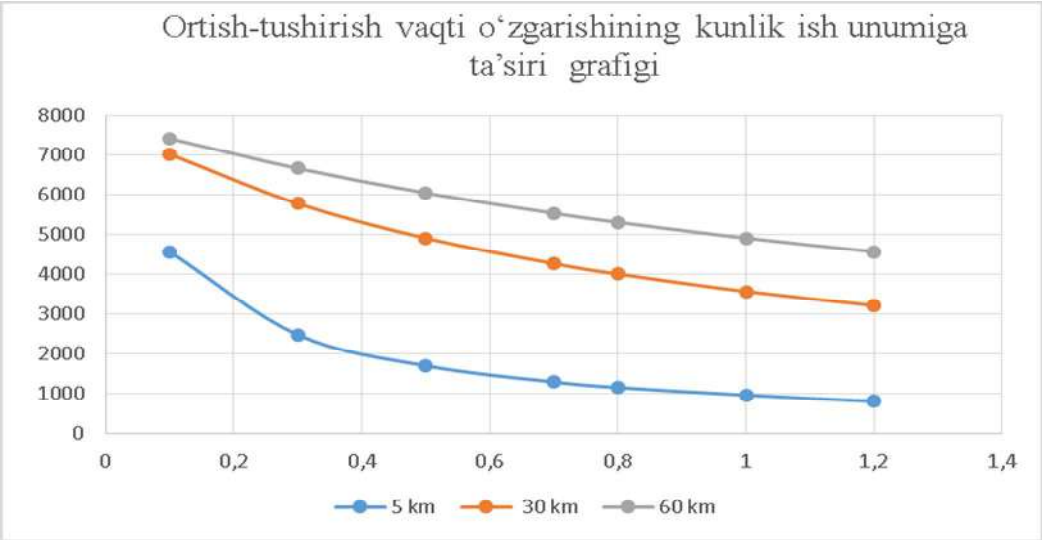
$$P_{k60-0.7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 0.7} = 5537 \quad tkm$$

$$P_{k60-0.8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 0.8} = 5312 \quad tkm$$

$$P_{k60-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4914 \quad tkm$$

$$P_{k60-1.2} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1.2} = 4571 \quad tkm$$

l_{yuq}, km	t_{O-T}, S						
	0,1	0,3	0,5	0,7	0,8	1	1,2
5	4571	2488	1709	1302	1163	972	816
30	7020	5781	4914	4273	4011	3574	3222
60	7417	6663	6048	5537	5312	4914	4571



Grafikdan ko’rinib turubdiki yuk ortish-tushirish vaqti oshgan sari transportning ish unumi kamayar ekan.

ye) ish vaqti o‘zgarishining kunlik ish unumiga ta’siri (tkm)

Topshiriqda berilgan T_{ish} ning qiymati o‘rniga jadvalda ko‘rsatilgan 6,7,...,12 soat qiymatlar uchun P_k hisoblanadi.

$$P_{k5-6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{6 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 2612 \quad tkm$$

$$P_{k5-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{7 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 3047 \quad tkm$$

$$P_{k5-8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 3483 \quad tkm$$

$$P_{k5-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{9 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 3918 \quad tkm$$

$$P_{k5-10} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 4354 \quad tkm$$

$$P_{k5-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{11 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 4789 \quad tkm$$

$$P_{k5-12} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{12 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 5224 \quad tkm$$

$$P_{k30-6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{6 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 4011 \quad tkm$$

$$P_{k30-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{7 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 4680 \quad tkm$$

$$P_{k30-8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 5349 \quad tkm$$

$$P_{k30-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{9 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 6017 \quad tkm$$

$$P_{k30-10} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 6686 \quad tkm$$

$$P_{k30-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{11 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 7354 \quad tkm$$

$$P_{k30-12} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{12 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 8023 \quad tkm$$

$$P_{k60-6} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{6 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4238 \quad tkm$$

$$P_{k60-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{7 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 4945 \quad tkm$$

$$P_{k60-8} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 5651 \quad tkm$$

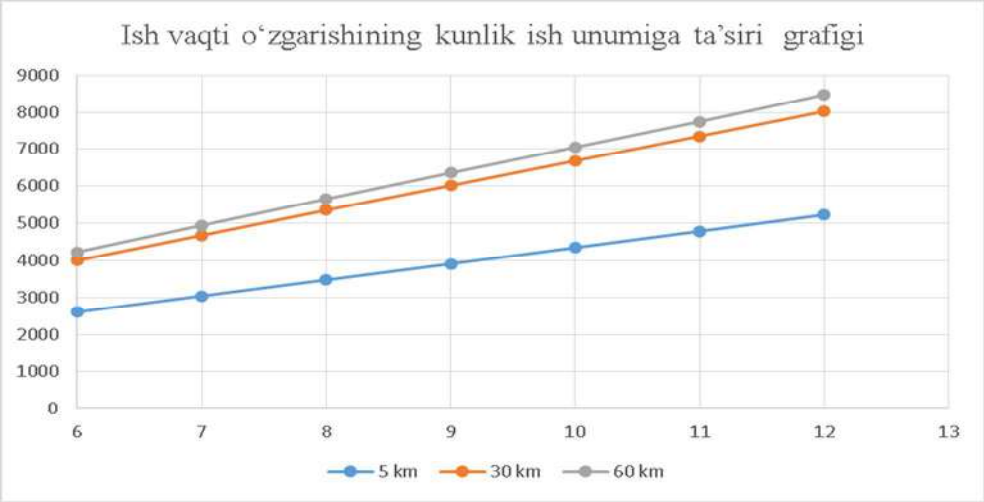
$$P_{k60-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{9 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 6358 \ \ tkm$$

$$P_{k60-10} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 7064 \ \ tkm$$

$$P_{k60-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{11 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 7749 \ \ tkm$$

$$P_{k60-12} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{12 \times 26 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 8477 \ \ tkm$$

l_{yuq}, km	T_{ISH}, soat						
	6	7	8	9	10	11	12
5	2612	3047	3483	3918	4354	4789	5224
30	4011	4680	5349	6017	6686	7354	8023
60	4238	4945	5651	6358	7054	7749	8477



Grafikdan ko’rinib turubdiki ish vaqti oshgan sari transportning ish unumi oshar ekan.

yo) transport vositasi yuk ko‘taruvchanligi o‘zgarishining kunlik ish unumiga ta’siri (tkm)

Topshiriqda berilgan q_i ning qiymati o‘rniga jadvalda ko‘rsatilgan 1,3,...,13 t qiymatlar uchun P_k hisoblanadi.

$$P_{k5-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 1 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 37 \ \ tkm$$

$$P_{k5-3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 3 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 111 \quad tkm$$

$$P_{k5-5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 5 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 185 \quad tkm$$

$$P_{k5-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 7 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 289 \quad tkm$$

$$P_{k5-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 9 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 333 \quad tkm$$

$$P_{k5-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 11 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 407 \quad tkm$$

$$P_{k5-13} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 13 \times 0{,}8 \times 0{,}9 \times 40 \times 5}{5 + 0{,}9 \times 40 \times 1} = 481 \quad tkm$$

$$P_{k30-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 1 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 137 \quad tkm$$

$$P_{k30-3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 3 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 411 \quad tkm$$

$$P_{k30-5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 5 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 685 \quad tkm$$

$$P_{k30-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 7 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 959 \quad tkm$$

$$P_{k30-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 9 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 1233 \quad tkm$$

$$P_{k30-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 11 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 1507 \quad tkm$$

$$P_{k30-13} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 13 \times 0{,}8 \times 0{,}9 \times 40 \times 30}{30 + 0{,}9 \times 40 \times 1} = 1781 \quad tkm$$

$$P_{k60-1} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 1 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 189 \quad tkm$$

$$P_{k60-3} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 3 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 567 \quad tkm$$

$$P_{k60-5} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 5 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 945 \quad tkm$$

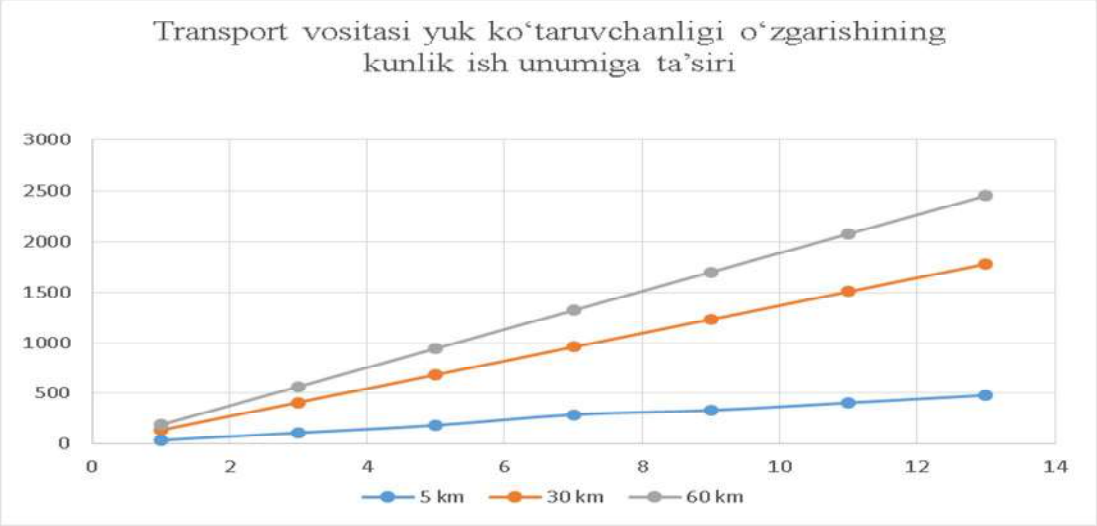
$$P_{k60-7} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 7 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 1323 \quad tkm$$

$$P_{k60-9} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 9 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 1701 \quad tkm$$

$$P_{k60-11} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 11 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 2079 \quad tkm$$

$$P_{k60-13} = \frac{T_{ish} \cdot q_n \cdot \gamma_{st} \cdot \beta \cdot V_T \cdot l_{yuk}}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{10{,}5 \times 13 \times 0{,}8 \times 0{,}9 \times 40 \times 60}{60 + 0{,}9 \times 40 \times 1} = 2457 \quad tkm$$

l_{yuq}, km	q_n, t						
	1	3	5	7	9	11	13
5	37	111	185	289	333	407	481
30	137	411	685	959	1233	1507	1781
60	189	567	945	1323	1701	2079	2457



Grafikdan ko’rinib turubdiki transport vositasi yuk ko‘taruvchanligi oshgan sari transportning ish unumi oshar ekan.

4 – Laboratoriya ishi

MAVZU: TRANSPORT VOSITASINI TANLASH

Ishning maqsadi: Yuklarni tashishda transport vositasini tanlash va ularni soatli ish unumi va tashish tannarxi bo‘yicha solishtirish.

Ishni bajarish tartibi:

1. Transport vositalarining marshrutlar bo‘yicha soatli ish unumini hisoblash.
2. Transport vositalarining marshrutlar bo‘yicha tashish tannarxini hisoblash.

Transport vositasini tanlash uchtadan kam bo‘lmagan avtomobillar (avtopoyezdlar) unumi va tashish tannarxini solishitirish orqali aniqalandi.

Avtomobilning soatlik unumi quyidagi formula orqali aniqlanadi.

$$W_Q = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}}; \quad \text{t/soat}$$

bu yerda: q_n - avtomobilning yuk ko‘tarish qobiliyati, t;

γ_{st}- yuk ko‘tarish qobiliyatidan statik foydalanish koeffitsiyenti;

V_t- avtomobilning o‘rtacha texnik tezligi (shahar ichida $q_n \le 7$t bo‘lganda 30 km/soat, $q_n > 7$t bo‘lganda 28 km/soat, shahar tashqarisida $q_n \le 7$t bo‘lganda 50 km/soat, $q_n \ge 7$t bo‘lganda 46 km/soat);

β- bosib o‘tilgan masofadan foydalanish koeffitsiyenti;

l_{yuk}- o‘rtacha yukli qatnov uzunligi, km;

t_{o-t}- ortish-tushirish uchun sarflangan vaqt, soat.

Bir tonna tashilgan yukning tannarxi quyidagicha aniqlanadi:

$$S_T = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}}; \text{ so‘m/t}$$

bu yerda: $S_{o‘z}$- 1 km bosib o‘tilgan masaofa uchun o‘zgaruvchan xarajatlar, so‘m/km;

S_{doim}- 1 soatli ish uchun doimiy xarajatlar, so‘m/soat.

Har bir marshrut bo‘yicha W_Q va S_T hisoblanib, unum va tannarx matritsalari to‘ldiriladi. So‘ngra unum matritsasining ustuni bo‘yicha eng katta qiymat, tannarx matritsasida esa eng kichik qiymat belgilanadi va yangi yutuqlar matritsasi hosil qilinadi. Matritsadagi nollar qatori eng maksimal unum va eng minimal tannarxga ega bo‘lgan transport vositasiga to‘g‘ri keladi va shu transport vositasi tashish uchun qabul qilinadi.

Izoh: 2-laboratoriya ishi asosida bajariladi.

TO’RTINCHI LABORATORIYA ISHINI BAJARISH UCHUN NAMUNA

Transport vositasini tanlash uchtadan kam bo‘lmagan avtomobillar (avtopoyezdlar) unumi va tashish tannarxini solishitirish orqali aniqalandi.

Yuk turiga qarab 3 ta transport vositasini tanlab olib shu transportlar bo’yicha hisob ishlarini bajariladi.

1. Kamaz-5320 $q_n = 8\ t$, $C_{uz} = 250\ so'm/km$, $C_{doim} = 750\ so'm/soat$, $t_{o-t} = 40/60 = 0{,}66\ soat$
2. MAN CLA 16.220 $q_n = 16\ t$, $C_{uz} = 150\ so'm/km$, $C_{doim} = 450\ so'm/soat$, $t_{o-t} = 1\ soat$
3. Kamaz-5320+CKB-8350 $q_n = 16\ t$, $C_{uz} = 380\ so'm/km$, $C_{doim} = 800\ so'm/soat$, $t_{o-t} = 1\ soat$

Qolgan ma’lumotlar 2-laboratoriyadagi har bir tuzilgan marshrut bo’yicha avtomobilning soatlik ish unumini va har bir tonna tashilgan yukning tannarxini 3ta tanlangan avtomobil bo’yucha hisoblab chiqamiz.

Avtomobilning soatlik unumi quyidagi formula orqali aniqlanadi.

$$W_Q = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}};\quad \text{t/soat}$$

bu yerda: q_n - avtomobilning yuk ko‘tarish qobiliyati, t;

γ_{st}- yuk ko‘tarish qobiliyatidan statik foydalanish koeffitsiyenti;

V_t- avtomobilning o‘rtacha texnik tezligi (shahar ichida $q_n \le 7t$ bo‘lganda 30 km/soat, $q_n > 7t$ bo‘lganda 28 km/soat, shahar tashqarisida $q_n \le 7t$ bo‘lganda 50 km/soat, $q_n \ge 7t$ bo‘lganda 46 km/soat);

β- bosib o‘tilgan masofadan foydalanish koeffitsiyenti;

l_{yuk}- o‘rtacha yukli qatnov uzunligi, km;

t_{o-t}- ortish-tushirish uchun sarflangan vaqt, soat.

Izoh: 2-laboratoriya ishi asosida bajariladi.

Kamaz-5320 avtomobili bo’yicha har bir marshrut uchun avtomobilning soatlik ish unumini hisoblab chiqamiz.

$$W_{Q1} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 0.95 \times 0.8 \times 45}{36.3 + 0.8 \times 45 \times 0.66} = \frac{273.6}{60} = 4.6 \ \ t/soat;$$

$$W_{Q2} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 0.95 \times 1 \times 45}{30.5 + 1 \times 45 \times 0.66} = \frac{342}{60.2} = 5.7 \ \ t/soat;$$

$$W_{Q3} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 0.8 \times 1 \times 45}{30.6 + 1 \times 45 \times 0.66} = \frac{288}{60.3} = 4.8 \ \ t/soat;$$

$$W_{Q4} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 0.7 \times 0.6 \times 45}{28.5 + 0.6 \times 45 \times 0.66} = \frac{151.2}{46.3} = 3.3 \ \ t/soat;$$

$$W_{Q5} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 1 \times 0.5 \times 45}{32 + 0.5 \times 45 \times 0.66} = \frac{180}{46.9} = 3.8 \ \ t/soat;$$

$$W_{Q6} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{8 \times 0.6 \times 0.5 \times 45}{25 + 0.5 \times 45 \times 0.66} = \frac{108}{39.9} = 2.7 \ \ t/soat;$$

MAN CLA 16.220 avtomobili bo’yicha har bir marshrut uchun avtomobilning soatlik ish unumini hisoblab chiqamiz.

$$W_{Q1} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.95 \times 0.8 \times 45}{36.3 + 0.8 \times 45 \times 1} = \frac{547.2}{72.3} = 7.6 \ \ t/soat;$$

$$W_{Q2} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.95 \times 1 \times 45}{30.5 + 1 \times 45 \times 1} = \frac{684}{75.5} = 9.1 \ \ t/soat;$$

$$W_{Q3} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.8 \times 1 \times 45}{30.6 + 1 \times 45 \times 1} = \frac{576}{75.6} = 7.6 \ t/soat;$$

$$W_{Q4} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.7 \times 0.6 \times 45}{28.5 + 0.6 \times 45 \times 1} = \frac{302.4}{55.5} = 5.4 \ t/soat;$$

$$W_{Q5} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 1 \times 0.5 \times 45}{32 + 0.5 \times 45 \times 1} = \frac{360}{54.5} = 6.6 \ t/soat;$$

$$W_{Q6} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.6 \times 0.5 \times 45}{25 + 0.5 \times 45 \times 1} = \frac{216}{47.5} = 4.5 \ t/soat;$$

KamAZ-5320+GKB-8350 avtomobili bo'yicha har bir marshrut uchun avtomobilning soatlik ish unumini hisoblab chiqamiz.

$$W_{Q1} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.95 \times 0.8 \times 40}{36.3 + 0.8 \times 40 \times 1} = \frac{486.4}{68.3} = 7.1 \ t/soat;$$

$$W_{Q2} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.95 \times 1 \times 40}{30.5 + 1 \times 40 \times 1} = \frac{608}{70.5} = 8.6 \ t/soat;$$

$$W_{Q3} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.8 \times 1 \times 40}{30.6 + 1 \times 40 \times 1} = \frac{512}{70.6} = 7.2 \ t/soat;$$

$$W_{Q4} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.7 \times 0.6 \times 40}{28.5 + 0.6 \times 40 \times 1} = \frac{268.8}{52.5} = 5.1 \ t/soat;$$

$$W_{Q5} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 1 \times 0.5 \times 40}{32 + 0.5 \times 40 \times 1} = \frac{320}{52} = 6.2 \ t/soat;$$

$$W_{Q6} = \frac{q_n \cdot \gamma_{st} \cdot \beta \cdot V_T}{l_{yuk} + \beta \cdot V_T \cdot t_{o-t}} = \frac{16 \times 0.6 \times 0.5 \times 40}{25 + 0.5 \times 40 \times 1} = \frac{192}{45} = 4.2 \ t/soat;$$

Bir tonna tashilgan yukning har bir marshrut bo'yicha tannarxi quyidagicha aniqlanadi:

$$S_T = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta} \left(C_{uz} + \frac{C_{doum}}{V_T} \right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}}; \text{ so'm/t}$$

bu yerda: $C_{o'z}$- 1 km bosib o‘tilgan masaofa uchun o‘zgaruvchan xarajatlar, so‘m/km;

C_{doim}- 1 soatli ish uchun doimiy xarajatlar, so‘m/soat.

Kamaz-5320 avtomobili uchun bir tonna tashilgan yukning har bir marshrut bo’yicha tannarxi quyidagicha aniqlanadi:

$$S_{T1} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{36.3}{8 \times 0.95 \times .08} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 0.95} =$$

$$= \frac{36.3}{6} \times 266.6 + \frac{495}{7.6} = 1613 + 65 = 1678 \ so'm/t;$$

$$S_{T2} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{30.5}{8 \times 0.95 \times 1} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 1} =$$

$$= \frac{30.5}{7.6} \times 266.6 + \frac{495}{8} = 1128.4 \ so'm/t;$$

$$S_{T3} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{30.6}{8 \times 0.8 \times 1} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 0.8} =$$

$$= \frac{30.6}{6.4} \times 266.6 + \frac{495}{6.4} = 1143.4 \ so'm/t;$$

$$S_{T4} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{28.5}{8 \times 0.7 \times 0.6} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 0.6} =$$

$$= \frac{28.5}{3.36} \times 266.6 + \frac{495}{4.8} = 2342.4 \ so'm/t;$$

$$S_{T5} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{32}{8 \times 1 \times 0.5} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 1} =$$

$$= \frac{32}{4} \times 266.6 + \frac{495}{8} = 2194.8 \ so'm/t;$$

$$S_{T6} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{25}{8 \times 0.6 \times 0.5} \times (250 + \frac{750}{45}) + \frac{750 \times 0.66}{8 \times 0.6} =$$

$$= \frac{25}{2.4} \times 266.6 + \frac{495}{4.8} = 2975.6 \ so'm/t;$$

MAN CLA 16.220 avtomobili uchun bir tonna tashilgan yukning har bir marshrut bo’yicha tannarxi quyidagicha

$$S_{T1}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{36.3}{16\times0.95\times.08}\times(150+\frac{450}{45})+\frac{450\times1}{16\times0.95}=$$

$$=\frac{36.3}{12.2}\times160+\frac{450}{15.2}=509\ so'm/t;$$

$$S_{T2}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{30.5}{16\times0.95\times1}\times(150+\frac{450}{45})+\frac{450\times1}{16\times1}=$$

$$=\frac{30.5}{16.2}\times150+\frac{450}{16}=349\ so'm/t;$$

$$S_{T4}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{28.5}{16\times0.7\times0.6}\times(150+\frac{450}{45})+\frac{450\times1}{16\times0.6}=$$

$$=792\ so'm/t;$$

$$S_{T5}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{32}{16\times1\times0.5}\times(150+\frac{450}{45})+\frac{450\times1}{16\times1}=$$

$$=668\ so'm/t;$$

$$S_{T6}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{25}{16\times0.6\times0.5}\times(150+\frac{450}{45})+\frac{450\times1}{16\times0.6}=$$

$$=879\ so'm/t;$$

KamAZ-5320+GKB-8350 avtomobili uchun bir tonna tashilgan yukning har bir marshrut bo'yicha tannarxi quyidagicha aniqlanadi:

$$S_{T1}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{36.3}{16\times0.95\times.08}\times(380+\frac{800}{45})+\frac{800\times1}{16\times0.95}=$$

$$=\frac{36.3}{12.2}\times400+\frac{800}{15.2}=1212\ so'm/t;$$

$$S_{T2}=\frac{l_{yuk}}{q_n\cdot\gamma_{st}\cdot\beta}\left(C_{uz}+\frac{C_{doum}}{V_T}\right)+\frac{C_{доим}\cdot t_{o-t}}{q_n\cdot\gamma_{ST}}=\frac{30.5}{16\times0.95\times1}\times(380+\frac{800}{45})+\frac{800\times1}{16\times1}=$$

$$=852\ so'm/t;$$

$$S_{T3} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{30.6}{16 \times 0.8 \times 1} \times (380 + \frac{800}{45}) + \frac{800 \times 1}{16 \times 0.8} =$$

$$= 1021 \ so'm/t;$$

$$S_{T4} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{28.5}{16 \times 0.7 \times 0.6} \times (380 + \frac{800}{45}) + \frac{800 \times 1}{16 \times 0.6} =$$

$$= 1751 \ so'm/t;$$

$$S_{T5} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{32}{16 \times 1 \times 0.5} \times (380 + \frac{800}{45}) + \frac{800 \times 1}{16 \times 1} =$$

$$= 1650 \ so'm/t;$$

$$S_{T6} = \frac{l_{yuk}}{q_n \cdot \gamma_{st} \cdot \beta}\left(C_{uz} + \frac{C_{doum}}{V_T}\right) + \frac{C_{доим} \cdot t_{o-t}}{q_n \cdot \gamma_{ST}} = \frac{25}{16 \times 0.6 \times 0.5} \times (380 + \frac{800}{45}) + \frac{800 \times 1}{16 \times 0.6} =$$

$$= 2163 \ so'm/t;$$

Har bir marshrut bo‘yicha W_Q va S_T hisoblanib, unum va tannarx matritsalari to‘ldiriladi. So‘ngra unum matritsasining ustuni bo‘yicha eng katta qiymat, tannarx matritsasida esa eng kichik qiymat belgilanadi va yangi yutuqlar matritsasi hosil qilinadi. Matritsadagi nollar qatori eng maksimal unum va eng minimal tannarxga ega bo‘lgan transport vositasiga to‘g‘ri keladi va shu transport vositasi tashish uchun qabul qilinadi.

Avtomobilning soatlik unumi matritsasi

T/R	Avtomobillar	Marshrutlar bo’yicha W_Q soatlik ish unumi					
		I	II	II	IV	V	VI
1	Kamaz-5320	4.5	5.7	4.8	3.3	3.8	2.7
2	MANCLA 16.220	7.6	9.1	7.6	5.4	6.6	4.5
3	KamAZ 5320+GKB-8350	7.1	8.6	7.2	5.1	6.2	4.2
	max	7.6	9.1	7.6	5.4	6.6	4.5

Tavakkallik matrisasi

T/R	Avtomobillar	Marshrutlar bo’yicha W_Q soatlik ish unumi farqi					
		I	II	II	IV	V	VI
1	Kamaz-5320	3.1	3.4	2.8	2.1	2.8	1.8
2	MANCLA 16.220	0	0	0	0	0	0
3	KamAZ-5320+GKB-8350	0.5	0.5	0.4	0.5	0.4	0.3

Bir tonna tashilgan yukning tannarxi matrisasi

T/R	Avtomobillar	Bir tonna tashilgan yukning har bir marshrut bo'yicha tannarxi					
		I	II	II	IV	V	VI
1	Kamaz-5320	1678	1128.4	1143.4	2342.4	2194.8	2875.6
2	MANCLA 16.220	509	349	419	792	668	879
3	KamAZ-5320+GKB-8350	1212	852	1021	1751	1650	2163
	min	509	349	419	792	668	879

Tavakkallik matrisasi

T/R	Avtomobillar						
		I	II	II	IV	V	VI
1	Kamaz-5320	1169	779.4	724.4	1550.4	1526.8	1996.6
2	MANCLA 16.220	0	0	0	0	0	0
3	KamAZ-5320+GKB-8350	703	503	602	959	982	1284

Bu jadvallardan kurinib to'ribdiki avtomobilning soatlik unumi va bir tonna tashilgan yukning tannarxi bo'yicha ham MANCLA 16.220 avtomobilining samaradorligi yuqori ekan.Shuning uchun birilgan marshrutlarda yuklarni tashish uchun MANCLA 16.220 avtomobilini tanlab olamiz.

5 – Laboratoriya ishi

MAVZU: TRANSPORT VOSITALARINING MARSHRUTLARDAGI ISH KO'RSATKICHLARINI HISOBLASH

Ishning maqsadi: Transport vositalarining turli marshrutlardagi kunlik ish ko'rsatkichlarini hisoblash.

Ishni bajarish tartibi:

2-laboratoriya ishida tuzilgan har bir marshrut uchun quyida keltirilgan ko'rsatkichlar hisoblanadi.

Harakatni tashkil etishdan asosiy maqsad ma'lum davr (vaqt) ichida belgilangan tashish ishlarini bajarishdan iborat. Rejada belgilangan vaqt turlicha bo'lishi mumkin. Masalan bir sutka yoki smena vaqti. Harakatni tashkil etishda quyidagilar ta'minlanishi lozim: sutka ichi soatlarida, yuk oqimi yo'nalishi va harakat zichligiga ko'ra transport vositalaridan maksimal foydalanish; har xil sharoitlarda yo'l harakati qoidalariga rioya qilingan holda harakat tezligini oshirish

hisobiga transport jarayonini tezlatish; tannarxni kamaytirgan holda tashishni o'z vaqtida kechiktirmasdan tashish; mexnat unumdorligini oshirish.

Transport vositasini marshrutlardagi ish ko'rsatkichlarini hisoblash formulalari.

1.Transport vositasining marshrutda ishlash vaqti

$$\mathrm{T_M} = \mathrm{T}_{ish} - t_0 = \mathrm{T}_{ish} - \frac{l_0^1 + l_0^2}{V_\mathrm{T}} \text{ ,soat}$$

2.Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_\mathrm{T}} + \sum t_{o-t} \text{ , soat}$$

3.Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{\mathrm{T_M}}{t_{ayl}}; \quad Z_{yuk} = Z_a \cdot n ,$$

4.Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a \text{; soat}$$

$$T'_{ish} = T'_M + t_0 \text{ ; soat}$$

5.Transport vositasining kunlik unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a \text{ ; t}$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a \text{ ; tkm}$$

6.Kunlik bosib o'tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} \text{; km}$$

7.Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{yuk} \cdot Z_a}{l_к}$$

8.Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} \text{ ; avt.}$$

9.O'rtacha yukli qatnov va 1 t yukni o'rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} \text{ ; km} \qquad l_{urt} = \frac{P_K}{Q_K} \text{ ; km}$$

10.Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\gamma_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} \; ; \quad \gamma_d = \frac{P_к}{q_n \cdot z_{yuk} \cdot l_{yuk}}$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

BESHINCHI LABORATORIYA ISHIGA NAMUNA

MAN CLA 16.220 avtomobili uchun

1-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$T_M = T_{ish} - t_0 = T_{ish} - \frac{l_0^1 + l_0^2}{V_T} = 8 - \frac{2 + 36}{45} = 8 - 0,8 = 7,2\ soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_T} + \sum t_{o-t} = \frac{180}{45} + 4 = 8 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{T_M}{t_{ayl}} = \frac{7.2}{8} = 0.9 \approx 1 \qquad Z_{yuk} = Z_a \cdot n = 1 * 4 = 4\ qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 8 * 1 = 8 soat$$

$$T'_{ish} = T'_M + t_0 = 8 + 0.8 = 8.8 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16 * 3.8 * 1 = 60.8t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * (1 * 35 + 0.8 * 32 + 1 * 23 + 1 * 55) * 1 = 2217.6 tkm$$

6. Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 180 * 1 + 2 + 36 = 218 km$$

7. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{юк} \cdot Z_a}{l_к} = \frac{145 * 1}{218} = 0.66$$

8. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{570000}{60,8 * 305} = \frac{570000}{18544} = 31\, avtomobil$$

9. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{145}{4} = 36,3 km \quad l_{o'rt} = \frac{P_K}{Q_K} = \frac{2217,6}{60,8} = 36,5\, km$$

10. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{60,8}{16 * 4} = \frac{60,8}{64} = 0,95 \quad ; \quad \lambda_{din} = \frac{P_к}{q_n \cdot z_{yuk} \cdot l_{yuk}}$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

2-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$T_M = T_{ish} - t_0 = T_{ish} - \frac{l_0^1 + l_0^2}{V_T} = 8 - \frac{2 + 36}{45} = 8 - 0,8 = 7,2\, soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_T} + \sum t_{o-t} = \frac{122}{45} + 4 = 6,7 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{T_M}{t_{ayl}} = \frac{7.2}{6,7} = 1,07 \approx 1 \quad Z_{yuk} = Z_a \cdot n = 1 * 4 = 4 qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 6,7 * 1 = 6,7 soat$$

$$T'_{ish} = T'_M + t_0 = 6{,}7 + 0.8 = 7{,}5 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16 * 3.8 * 1 = 60.8t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * (1 * 35 + 0{,}8 * 32 + 1 * 23 + 1 * 32) * 1 = 1849{,}6 tkm$$

6. Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 122 * 1 + 2 + 36 = 160 \ km$$

7. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{юк} \cdot Z_a}{l_к} = \frac{122 * 1}{160} = 0.76$$

8. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{114000}{60{,}8 * 305} = \frac{114000}{18544} = 6 avtomobil$$

9. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{122}{4} = 30{,}5 km \quad l_{o'rt} = \frac{P_K}{Q_K} = \frac{1849{,}6}{60{,}8} = 30{,}4 km$$

10. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{60{,}8}{16 * 4} = \frac{60{,}8}{64} = 0{,}95 \ ;$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

3-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$T_M = T_{ish} - t_0 = T_{ish} - \frac{l_0^1 + l_0^2}{V_T} = 8 - \frac{2 + 36}{45} = 8 - 0{,}8 = 7{,}2 soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_T} + \sum t_{o-t} = \frac{92}{45} + 3 = 6{,}7 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{T_M}{t_{ayl}} = \frac{7{,}2}{5} = 1{,}4 \approx 1 \quad Z_{yuk} = Z_a \cdot n = 1 * 4 = 3 qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 5 * 1 = 5 soat$$

$$T'_{ish} = T'_M + t_0 = 5 + 0.8 = 5{,}8 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16 * 2{,}4 * 1 = 38{,}4 t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * (1 * 35 + 0{,}8 * 32 + 0{,}6 * 25) * 1 = 1209{,}6 tkm$$

6. Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 92 * 1 + 2 + 36 = 130 km$$

7. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{юк} \cdot Z_a}{l_к} = \frac{92}{130} = 0{,}7$$

8. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{48000}{38{,}4 * 305} = \frac{48000}{11712} = 4 \ avtomobil$$

9. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{92}{3} = 30{,}6 km \quad l_{o'rt} = \frac{P_K}{Q_K} = \frac{1209{,}6}{38{,}4} = 31{,}5 km$$

10. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{38{,}4}{16 * 4} = \frac{38{,}4}{48} = 0{,}8 \ ;$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

4-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$T_M = T_{ish} - t_0 = T_{ish} - \frac{l_0^1 + l_0^2}{V_T} = 8 - \frac{2 + 36}{45} = 8 - 0{,}8 = 7{,}2 soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_T} + \sum t_{o-t} = \frac{92}{45} + 2 = 4 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{T_M}{t_{ayl}} = \frac{7{,}2}{4} = 1{,}8 \approx 2 \quad Z_{yuk} = Z_a \cdot n = 2 * 2 = 4 qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 4 * 8 = 8 soat$$

$$T'_{ish} = T'_M + t_0 = 8 + 0{,}8 = 8{,}8 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16 * 1{,}4 * 2 = 44{,}8 t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * (0{,}8 * 32 + 0{,}6 * 25) * 2 = 1299 km$$

6. Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 92 * 2 + 2 + 36 = 222 km$$

7. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{юк} \cdot Z_a}{l_к} = \frac{57 * 2}{122} = \frac{114}{222} = 0{,}51$$

8. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{70000}{44{,}8 * 305} = \frac{70000}{13664} = 5 \ avtomobil$$

9. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{57}{2} = 28{,}5 km \quad l_{o'rt} = \frac{P_K}{Q_K} = \frac{1299}{44{,}8} = 28{,}9 \ km$$

10. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{44{,}8}{16 * 4} = \frac{44{,}8}{64} = 0{,}7;$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

5-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$T_M = T_{ish} - t_0 = T_{ish} - \frac{l_0^1 + l_0^2}{V_T} = 8 - \frac{2 + 36}{45} = 8 - 0{,}8 = 7{,}2 soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_T} + \sum t_{o-t} = \frac{64}{45} + 1 = 2{,}4 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{T_M}{t_{ayl}} = \frac{7{,}2}{2{,}4} = 3 \qquad Z_{yuk} = Z_a \cdot n = 3 * 1 = 3 \ qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 2{,}4 * 3 = 7{,}2 soat$$

$$T'_{ish} = T'_M + t_0 = 7{,}2 + 0.8 = 8 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16*1*3 = 48t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * 1 * 32 * 3 = 1536 \ tkm$$

6. Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 64 * 3 + 2 + 36 = 230 \ km$$

7. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{yuk} \cdot Z_a}{l_к} = \frac{32*3}{230} = \frac{92}{230} = 0{,}4$$

8. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{240000}{48 * 305} = \frac{240000}{14640} = 16 \ avtomobil$$

9. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{32}{1} = 32 km \qquad l_{o'rt} = \frac{P_K}{Q_K} = \frac{1536}{48} = 32 \ km$$

10. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{48}{16 * 3} = \frac{48}{64} = 1 \ ;$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

6-marshrut uchun:

1. Transport vositasining marshrutda ishlash vaqti

$$\mathrm{T_M} = \mathrm{T}_{ish} - t_0 = \mathrm{T}_{ish} - \frac{l_0^1 + l_0^2}{V_\mathrm{T}} = 8 - \frac{2 + 36}{45} = 8 - 0{,}8 = 7{,}2 soat$$

2. Transport vositasining bir aylanish vaqti

$$t_{ayl} = t_h + \sum t_{o-t} = \frac{l_a}{V_\mathrm{T}} + \sum t_{o-t} = \frac{50}{45} + 1 = 2{,}1 soat$$

3. Kunlik aylanishlar va qatnovlar soni

$$Z_a = \frac{\mathrm{T_M}}{t_{ayl}} = \frac{7{,}2}{2{,}1} = 3 \qquad Z_{yuk} = Z_a \cdot n = 3*1 = 3 qatnov$$

4. Aylanishlar sonini yaxlitlash hisobiga ish va marshrut vaqtlarini hisoblash

$$T'_M = t_{ayl} \cdot Z_a = 2{,}1 * 3 = 6{,}3 soat$$

$$T'_{ish} = T'_M + t_0 = 6{,}3 + 0{,}8 = 7{,}1 soat$$

5. Transport vositasining kunlik ish unumi

$$Q_K = q_n \cdot \sum \gamma_{st} \cdot Z_a = 16 * 0{,}6 * 3 = 28{,}8 t$$

$$P_K = q_n \cdot (\sum \gamma_{st} \cdot l_{yuk}) Z_a = 16 * 0{,}6 * 25 * 3 = 720\ tkm$$

6, Kunlik bosib o‘tilgan masofa

$$l_K = l_a \cdot Z_a + l_{01} + l_{02} = 50 * 3 + 2 + 36 = 188 km$$

6. Kunlik masofadan foydalanish koeffitsiyenti

$$\beta = \frac{\sum l_{yuk} \cdot Z_a}{l_к} = \frac{25 * 3}{188} = \frac{75}{188} = 0{,}4$$

7. Ekspluatatsiyadagi avtomobillar soni

$$A_e = \frac{\sum Q_y}{Q_к \cdot Д_{yil}} = \frac{108000}{28{,}8 * 305} = \frac{108000}{8784} = 12\ avtomobil$$

8. O‘rtacha yukli qatnov va 1 t yukni o‘rtacha tashish masofalari

$$l_{yuk} = \frac{\sum l_{yuk}}{n} = \frac{25}{1} = 25 km \qquad l_{o'rt} = \frac{P_K}{Q_K} = \frac{720}{28{,}8} = 25\ km$$

9. Yuk ko‘taruvchanlikdan foydalanish statik va dinamik koeffitsiyentlar

$$\lambda_{st} = \frac{Q_к}{q_n \cdot z_{yuk}} = \frac{28{,}8}{16 * 3} = \frac{28{,}8}{48} = 0{,}6 \ ;$$

Yuk ko’taruvchanlikdan foydalanishning dinamik koeffitsiyenti agar yuk ko’tarish qobiliyati har xil bo’lgan avtomobillar ishlatilsa qo’llaniladi.

6 – Laboratoriya ishi

MAVZU: AVTOTRANSPORT KORXONASINING YILLIK ISHLAB CHIQARISH DASTURINI HISOBLASH

Ishning maqsadi: Transport vositalarining kunlik ish ko‘rsatkich- lari asosida avtotransport saroyining yillik ishlab chiqarish dasturini hisoblash.

Ishni bajarish tartibi:

Ishlab chiqarish dasturini hisoblash uchun transport vositalarining quyidagi o‘rtacha ish ko‘rsatkichlari hisoblanadi

Avtotrasnport saroyi deyilganda uning ixtiyoridagi avtomobil (avtobus) lar, tirkami va yarimtirkamalar tushuniladi. Ular o’z navbatida turlari, markalari va transport vositalari miqdorlari bilan xarakterlanib, tashish bilan bog’liq ishlab

chiqarish dasturini to'liq bajarishga qaratilgandirlar. Transport vositalari turlari va modullari, avtotransport saroyining oldiga qo'yilgan vazifa hamda bajarilishi lozim bo'lgan ishlarga bog'liqdir.

Avtotransport korxonasining yillik ishlab chiqarish dasturini hisoblash formulalari.

1. Avtomobillarning o'rtacha ishda bo'lish vaqti

$$T_{ish.o'rt} = \frac{\sum_{i=1}^{n} A_{ei} \cdot T_{ishi}}{\sum_{n} A_{ei}} \text{ ; soat}$$

2. Avtokorxona bo'yicha o'rtacha kunlik bosib o'tilgan masofa

$$l_{к.o'rt.} = \frac{\sum A_{ei} \cdot l_{ki}}{\sum A_{ei}} \text{ ; km}$$

3. Avtokorxona bo'yicha o'rtacha masofadan foydalanish koeffitsiyenti

$$\beta_{o'rt} = \frac{\sum A_{ei} \cdot l_{.yuk.i} \cdot Z_{yuk.i}}{\sum A_{ei} \cdot l_{кi}}$$

4. Yuk ko'taruvchanlikdan statik va dinamik foydalanish o'rtacha koeffitsiyentlari

$$\gamma_{st.o'rt} = \frac{\sum A_{ei} \cdot \gamma_{sti} \cdot Z_{yuki}}{\sum A_{ei} \cdot Z_{yuki}}; \qquad \gamma_{dn.o'rt} = \frac{\sum A_{ei} \cdot \gamma_{\partial ni} \cdot Z_{yuki}}{\sum A_{ei} \cdot Z_{yuki}};$$

5. O'rtacha yukli qatnov uzunligi va 1 t yukni tashish o'rtacha masofasi

$$l_{yuk.o'rt} = \frac{\sum A_{ei} \cdot l_{yuki} \cdot Z_{yuki}}{\sum A_{ei} \cdot Z_{yuki}} \text{ ; km} \qquad l_{o'rt} = \frac{\sum P_{кi}}{\sum Q_{кi}} \text{ ; km}$$

Yillik ishlab chiqarish dasturini hisoblash:

Avtomobillarning kunlik yuk tashish hajmi

$$Q_к = \frac{T_{ish.o'rt} \cdot q_n \cdot \gamma_{st.o'rt} \cdot \beta_{o'rt} \cdot V_T \cdot \sum A_{ei}}{l_{yuko'rt} + \beta_{o'rt} \cdot V_T \cdot t_{o-t}} \text{ ; t}$$

Yillik yuk tashish hajmi $Q_y = Q_k \cdot D_{yik}$; t

Kunlik yuk oboroti $P_k = Q_k \cdot l_{o'rt}$; tkm

Yillik yuk oboroti $P_y = R_k \cdot D_{yik}$; tkm

Hisobdagi avtomobillar soni $A_h = \frac{\sum A_{ei}}{\alpha_{ich}}$

OLTINCHI LABORATORIYA ISHIGA NAMUNA

Ishlab chiqarish dasturini hisoblash uchun transport vositalarining quyidagi o'rtacha ish ko'rsatkichlari hisoblanadi:

1. Avtomobillarning o‘rtacha ishda bo‘lish vaqti

$$T_{ish.o'rt} = \frac{\sum_{i=1}^{n} A_{ei} \cdot T_{ishi}}{\sum_{n} A_{ei}} = \frac{31 \cdot 8{,}8 + 6 \cdot 7{,}5 + 4 \cdot 5{,}8 + 5 \cdot 8{,}8 + 16 \cdot 8 + 12 \cdot 7{,}1}{31 + 6 + 4 + 5 + 16 + 12} = \frac{598{,}2}{74} = 8;\ soat$$

2. Avtokorxona bo‘yicha o‘rtacha kunlik bosib o‘tilgan masofa

$$l_{к.o'rt.} = \frac{\sum A_{ei} \cdot\ l_{ki}}{\sum A_{ei}} = \frac{31 \cdot 218 + 6 \cdot 160 + 4 \cdot 130 + 5 \cdot 222 + 16 \cdot 230 + 12 \cdot 188}{31 + 6 + 4 + 5 + 16 + 12} = \frac{15284}{74} = 206{,}5;\ km$$

3. Avtokorxona bo‘yicha o‘rtacha masofadan foydalanish koeffitsiyenti

$$\beta_{o'rt} = \frac{\sum A_{ei} \cdot l_{юki} \cdot Z_{yuki}}{\sum A_{ei} \cdot l_{ki}} = \frac{31 \cdot 363 \cdot 4 + 6 \cdot 305 \cdot 4 + 4 \cdot 306 \cdot 3 + 5 \cdot 285 \cdot 4 + 16 \cdot 323 \cdot 3 + 12 \cdot 253}{31 \cdot 218 + 6 \cdot 160 + 4 \cdot 130 + 5 \cdot 222 + 16 \cdot 230 + 12 \cdot 188} = \frac{86064}{15284} = 0{,}56$$

4. Yuk ko‘taruvchanlikdan statik va dinamik foydalanish o‘rtacha koeffitsiyentlari

$$\gamma_{st.o'rt} = \frac{\sum A_{ei} \cdot \gamma_{sti} \cdot Z_{yuki}}{\sum A_{ei} \cdot Z_{yuki}} = \frac{31 \cdot 0{,}95 \cdot 4 + 6 \cdot 0{,}95 \cdot 4 + 4 \cdot 0{,}8 \cdot 3 + 5 \cdot 0{,}7 \cdot 4 + 16 \cdot 1 \cdot 3 + 12 \cdot 0{,}6 \cdot 3}{31 \cdot 4 + 6 \cdot 4 + 4 \cdot 3 + 5 \cdot 4 + 16 \cdot 3 + 12 \cdot 3} = \frac{233{,}8}{264} = 0{,}88$$

5. O‘rtacha yukli qatnov uzunligi va 1 t yukni tashish o‘rtacha masofasi

$$l_{yuk.o'rt} = \frac{\sum A_{ei} \cdot l_{yuki} \cdot Z_{yuki}}{\sum A_{ei} \cdot Z_{yuki}} = \frac{86064}{264} = 32{,}6\ \ km;$$

$$l_{o'rt} = \frac{\sum P_{ki}}{\sum Q_{ki}} = \frac{2217{,}6 + 1849{,}6 + 1209{,}6 + 1299 + 1536 + 720}{60{,}8 + 60{,}8 + 38{,}4 + 44{,}8 + 48 + 28{,}8} = \frac{8831{,}8}{281{,}6} = 31{,}4\ km$$

Yillik ishlab chiqarish dasturini hisoblash:

Avtomobillarning kunlik yuk tashish hajmi

$$Q_к = \frac{T_{ish.o'rt} \cdot q_n \cdot \gamma_{st.o'rt} \cdot \beta_{o'rt} \cdot V_T \cdot \sum A_{ei}}{l_{yuk.o'rt} + \beta_{o'rt} \cdot V_T \cdot t_{o-t}} = \frac{8 \cdot 16 \cdot 0{,}88 \cdot 0{,}56 \cdot 45 \cdot 74}{32{,}6 + 0{,}56 \cdot 45 \cdot 1} = \frac{210051}{57{,}8} = 3634t$$

Yillik yuk tashish hajmi $Q_y = Q_k \cdot D_{yik} = 3634 \cdot 305 = 1108370$ t;

Kunlik yuk oboroti $P_k = Q_k \cdot l_{o‘rt} = 3634 \cdot 31{,}4 = 114107{,}6$ tkm;

Yillik yuk oboroti $P_y = R_k \cdot D_{yik} = 114107{,}6 \cdot 305 = 34802218$ tkm;

Hisobdagi avtomobillar soni $A_h = \frac{\sum A_{ei}}{\alpha_{ich}} = \frac{74}{0.8} = 93av$

7 – Laboratoriya ishi

MAVZU: TRANSPORT VOSITASI HARAKAT GRAFIGINI TUZISH

Ishning maqsadi: Transport vositasining vaqt birligi (smena davomida) ichida marshrutda ishlashini tashkil etish va va uni grafik ko‘rinishida tasvirlash

Ishni bajarish tartibi:

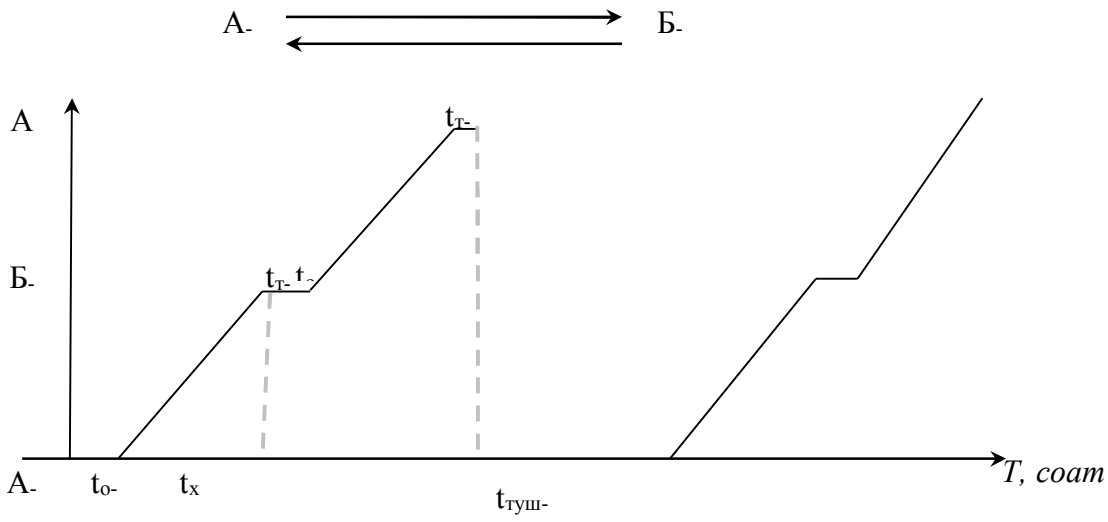
Transport vositasining marshrutdagi harakat grafigini tuzish uchun 2-laboratoriya ishida tuzilgan bitta mayatnik va bitta halqasimon marshrut sxemasini tanlab olinadi va 5-laboratoriya ishida bajarilgan hisob-kitoblardan foydalaniladi.

Harakat grafigi «vaqt-masofa» koordinatalarida qurilib, bunda abg‘issa o‘qida ish vaqti, ordinata o‘qida marshrut sxemasi bo‘yicha punktlararo masofalar ko‘rsatiladi. Avtokorxona joylashgan punkt koordinata boshida olinadi. Vaqt o‘qida ortish, harakatlanish tushirish va tushlik vaqtlari ko‘rsatiladi. Harakat vaqti quyidagicha aniqlanadi.

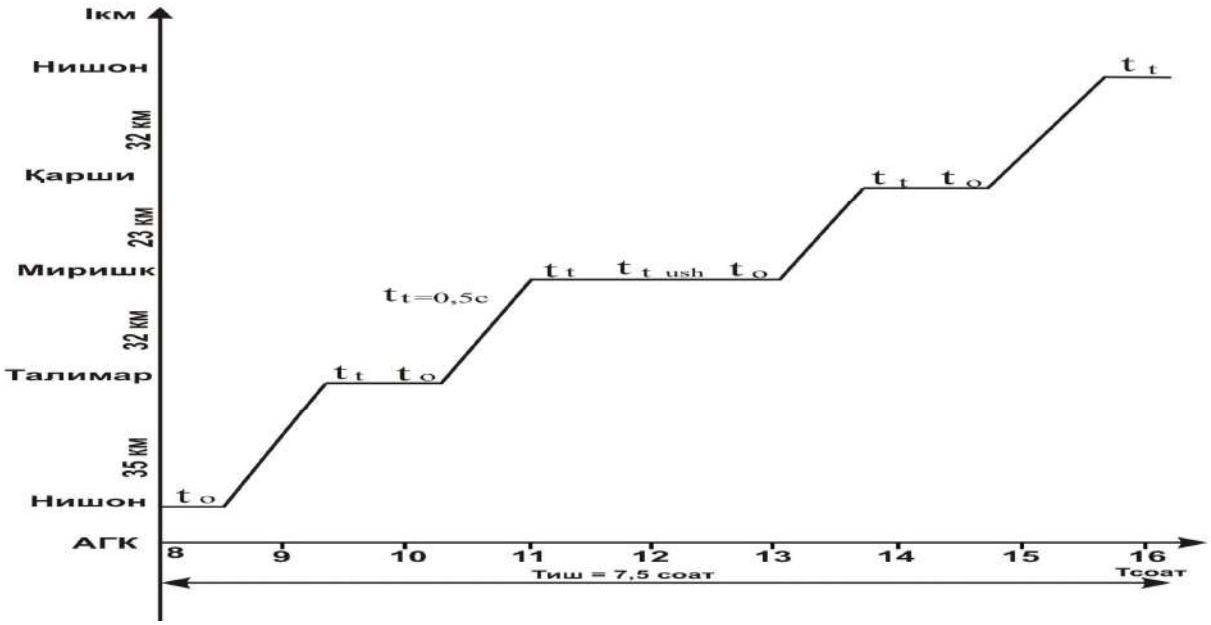
$$t_n = \frac{l}{V_T} \text{ ; soat}$$

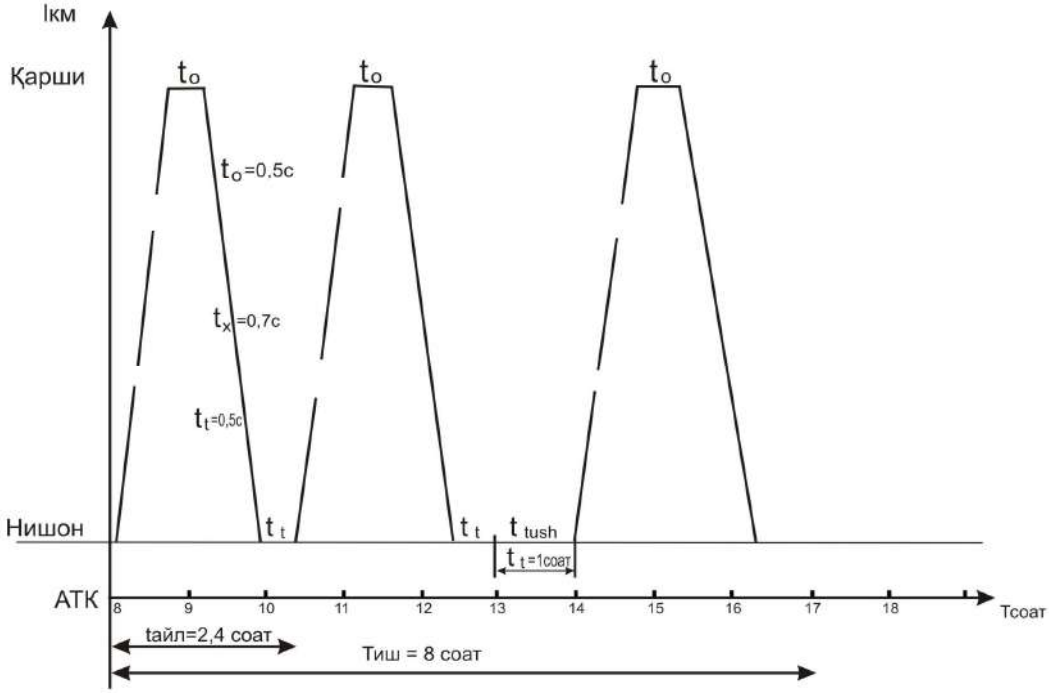
bu yerda: l- punktlararo masofalar, km.

Har 3-4 soatdan so‘ng avtomobilga tushlik vaqti beriladi (smena davomida 1 soat).



Halqasimon marshrut bo’yicha 2-marshrut





Mayatnikli marshrut

8 – Laboratoriya ishi

MAVZU: AVTOMOBILLARDA SHAHARLARARO TASHISH

Ishning maqsadi: Shaharlararo yuklarni tashishda transport vositalaridan foydalanish samaradorligini oshirish.

Ishni bajarish tartibi:

Berilgan A-YE punktlari o‘rtasida to‘g‘ridan-to‘g‘ri tashish hamda yuk tashish avtomobil bekatlari tashkil etib, yuklarni uchastkalar bo‘ylab tashishda yuklarni yetkazib berish vaqti hisoblanadi.

Shaharlararo tashishdagi mayda partiyaali yuklarni bir joyga yig’ib komplektlab tashishni tashkil etishda yuk tashish avtomobili bekati (YUTAB)ning ahamiyati katta. Bunday bekatlar omboriga yuklarni tegishli transport vositalari keltiradilar. Yuklarni yo’nalishlariga qarab komplektlab, avtopoezdlarda yuk egalariga jo’natiladi. Bunday, oldindan komplektlab yuklarni tashish tizimi, avtomobil va avtopoezdlar yuk ko’tarish qobiliyatidan unumli foydalanish imkonini beradi.

Tashish shartlari: Avtopoyezd rusumi: MAZ-543202-220+MAZ-93802 (q_n=14t); V_t = 50 km/soat; t_d=14 soat; t_{o-t} = 2 soat; t_{uu} = 30 min;

t_{tush} = 1 soat

A _____ YE (to‘g‘ridan-to‘g‘ri tashish)

A _____ B ____ V _____ G _____ D _____ YE (uchastkalar bo‘yicha tashish)

To‘g‘ridan-to‘g‘ri tashishda yuklarni yetkazib berish vaqti:

$$t_q = t_h + t_{o-t} + t_d \text{ ; soat}$$

Uchastkalar bo‘yicha yuklarni yetkazib berish vaqti:

$$t_q = t_h + t_{tush} + t_{uu} \text{ ; soat}$$

bu yerda: V_t – avtomobilning texnik tezligi, km/soat;

t_d - haydovchiga katta dam berish vaqti, soat;

t_{o-t} - avtomobilga yuk ortish va tushirish vaqti, soat;

t_{uu} - tyagachga bir tirkamani uzib boshqasini ulash vaqti, soat;

t_{tush} - tushlik vaqti, soat.

SAKKIZINCHI LABORATORIYA ISHIGA NAMUNA

1. To'g'ridan to'g'ri tashishda yuklarni yetkazib berish vaqtini 30-variant bo'yicha hisoblab chiqamoz.

$$t_q = t_h + t_{o-t} + t_d \; ; \; soat$$

$$t_h = \frac{l}{V_T} = \frac{790}{50} = 15\,,8 \;\; soat$$

$$t_q = 15\,,8 + 2 + 14 = 31\,,8 \;\; soat$$

Berilgan

$V_T = 50$ km/s

$t_{o\text{-}t} = 2$ soat

$t_d = 14$ soat

$L_{A\text{-}4E} = 790$ km

2. Uchastkalar bo'yicha yuklarni yetkazib berish vaqtini 30- variant bo'yicha hisoblab chiqamiz.

$$t_q = t_h + t_{tush} + t_{uu} \; ; \; soat$$

$$t_{h_1} = \frac{l_1}{V_T} = \frac{150}{50} = 3 \;\; soat$$

$$t_{h_2} = \frac{l_2}{V_T} = \frac{180}{50} = 3\,,6 \;\; soat$$

$$t_{h_3} = \frac{l_3}{V_T} = \frac{160}{50} = 3\,,2 \;\; soat$$

$$t_{h_4} = \frac{l_4}{V_T} = \frac{140}{50} = 2\,,8 \;\; soat$$

$$t_{h_5} = \frac{l_5}{V_T} = \frac{160}{50} = 3\,,2 \;\; soat$$

$$t_h = 3 + 3\,,6 + 3\,,2 + 2\,,8 + 3\,,2 = 15\,,8 \;\; soat$$

$$t_q = 15\,,8 + 5 + 2{,}5 = 23\,,3 \;\; soat$$

Hisob kitoblar natijasida ko'rinib turibdiki yuklarni uchastkalar bo'yicha tashilganda samaradorlik yuqori bo'lar ekan.

9– Laboratoriya ishi

MAVZU: YO'LOVCHILAR OQIMINI KUZATISH VA UNI TAHLIL ETISH

Ishning maqsadi: Passajirlar oqimini kuzatish usullari bilan tanishish va uning sutka soatlari bo'yicha taqsimlanishini tahlil qilish.

Ishni bajarish tartibi:

1. Passajirlar oqimlarini kuzatish usullari bilan tanishish
2. Avtobus marshruti sxemasini tuzish
3. Sutka soatlari bo'yicha passajirlar oqimi epyurasini chizish va notekislik koeffitsiyentini aniqlash.

Shahar aholisiga ish joylariga, yashash joylariga, dam olish va boshqa maishiy talablarini qondirish joylariga qisqa vaqtlarda yetib borishlari uchun transport vositalari talab etiladi.

Tashishga bo'lgan talab shahar hududining o'lchamiga, aholining moddiy ta'minlanganligi va madaniyat darajasiga ko'p jihatdan bog'liqdir.

Shahar transportining eng ko'p tarqalgan turlariga tramvay, avtobus, trolleybus, yengil taksi avtomobili va metropoliten kiradi.

Ushbu passajirlarni tashishga mo'ljallangan transport vositalari quyidagi belgilariga qarab guruhlarga bo'linadi:

Vazifasiga ko'ra – umumfoydalanishdagi, yakka tartibdagi foydalanishdagi va korxonalarga tegishli. Umumfoydalanish transport vositalariga: tramvay, trolleybus, avtobus, metropoliten, yengil avtomobil-taksi, ikkinchisiga shaxsiy foydalanuvdagi yengil avtomobillar, mototsiklllar, velosiped va mopedlar, uchinchisiga esa korxona va tashkilotlarga qarashli avtobus va yengil avtomobillar kiradi.

Foydalanish xarakteriga ko'ra –oldindan ma'lum yo'nalishlarda tashishlarni amalga oshiruvchi va passajirlar tomonidan belgilangan yo'nalishlarda harakatlanuvchi (turistik, buyurtmali) hamda yengil avtomobil-taksilarga bo'linadi.

Tashish turiga ko'ra – shahar ichida, shahar atrofida, mahalliy, shaharlararo, xalqaro va turistik.

Shahar ichida ishlovchi avtobuslar ma'lum yo‘nalishlarda passajirlarni tashishga mo‘ljallangan bo‘ladi.

Shahar atrofi yo‘nalishlarida ishlovchi avtobuslar passajirlarni shahardan shahar atrofiga tashishga mo‘ljallangan.

Mahalliy yo‘nalishlardagi tashishlar tumanlar markazlari, jamoa xo‘jaliklari, aholi yashash joylarini birlashtirishga mo‘ljallangan.

Shaharalararo tashishlargan shahar va posyolka chegarasidan 50 km dan ortiq masofaga tashishlar kiradi.

Xalqaro avtomobil transporti bilan passajirlarni tashishda davlatlararo chegaralar kesib o‘tiladi.

Sutka soatlari bo‘yicha passajirlar oqimi notekislik koeffitsiyenti quyidagi formula orqali aniqlanadi:

$$\eta_n = \frac{Q_{\max}}{Q_{o'rt}}$$

bu yerda: Q_{max} – passajirlar oqimi «tig‘iz» vaqtidagi passajirlar soni;

$Q_{o‘rt}$ – bir soatga to‘g‘ri keluvchi passajirlar soni: $Q_{o‘rt} = \Sigma Q/n$

Sutka soatlari bo‘yicha passajirlar oqimining taqsimlanishi

T/R	Sutka soatlari	To‘g‘ri yo‘nalish (A)		Teskari yo‘nalish (B)		Jami
		foiz	pass.	foiz	pass	
1.	5-6	1,5		1		
2.	6-7	4,5		3,5		
3.	7-8	8,5		8		
4.	8-9	11		9		
5.	9-10	8		7		
6.	10-11	6		5,5		
7.	11-12	5		4		
8.	12-13	4		4		

9.	13-14	4,5		4,5		
10.	14-15	5		5,5		
11.	15-16	6		6,5		
12.	16-17	7		8		
13.	17-18	8,5		10		
14.	18-19	7		9		
15.	19-20	6		6		
16.	20-21	4		4,5		
17.	21-22	2		2,5		
18.	22-23	1,5		1,5		
	n = 18	100		100		Σ Q =

TO'QQIZINCHI LABORATORIYA ISHIGA NAMUNA

Sutka soatlari bo'yicha passajirlar oqimining taqsimlanishi

T/R	Sutkasoatlari	To'g'ri yo'nalish (A)		Teskariyo'nalish (B)		Jami
		foiz	pass.	foiz	pass	
1.	6-7	3	126	2	80	206
2.	7-8	5	210	4	160	370
3.	8-9	12	504	10	400	904
4.	9-10	9	378	8	320	698
5.	10-11	7	294	7	280	574
6.	11-12	5	210	5	200	410
7.	12-13	8	336	6	240	576
8.	13-14	7	294	7	280	574
9.	14-15	6	252	8	320	572
10.	15-16	7	294	8	320	614
11.	16-17	8	336	9	360	696

12.	17-18	10	420	11	440	860
13.	18-19	9	378	10	400	778
14.	19-20	4	168	5	200	368
15.	n = 14	100	4200	100	4000	ΣQ =8200

$$Q_{o'r} = \frac{\sum Q}{n} = \frac{8200}{14} = 586 \qquad \eta_n = \frac{Q_{\max}}{Q_{o'rt}} = \frac{904}{586} = 1{,}5$$

10 – Laboratoriya ishi

MAVZU: MARSHRUTDA ISHLOVCHI AVTOBUSLAR SONINI VA HARAKAT INTERVALINI ANIQLASH

Ishning maqsadi: Sutkaning har bir soatida avtobuslarga bo‘lgan talabni va harakat intervalini hisoblash.

Ishni bajarish tartibi:

1. Marshrutda avtobusning bir aylanish vaqtini hisoblash.
2. Sutka soatlari bo‘yicha avtobuslar sonini hisoblash.
3. Sutka soatlari bo‘yicha harakat intervalini aniqlash.

Avtobuslar harakatini tashkil etish marshrutda reys vaqtini o‘lchash xronometrajiga ko‘ra passajirlar oqimining hosil bo‘lishi va taqsimlanishi ma’lumotlarini o‘rganish natijalariga asoslanib, bu o‘z navbatida harakat intervali va chastotasini aniqlash, avtobuslarning harakat jadvalini tuzish, haydovchilar jamoasining ish va dam olish tartiblarini tanlashga xizmat qiladi.

Berilgan marshrutda avtobusning bir aylanish vaqti quyidagi formula orqali aniqlanadi:

$$t_{ayl} = 2 \cdot (\frac{l_M}{V_T} + n_{obs} \cdot t_{mit} + t_{mnt}); \text{ soat}$$

bu yerda: l_M- marshrut uzunligi, km;

V_T- texnik harakat tezligi, km/soat;

t_{mit} - oraliq bekatda to‘xtash vaqti, min;

n_{ost} - oraliq bekatlar soni;

t_{mnt} - oxirgi bekatda turish vaqti, min.

Sutka soatlari bo‘yicha avtobuslar soni quyidagicha aniqlanadi:

$$A_M = \frac{Q_{max} \cdot t_{ayl}}{q_n}; \text{ avt.}$$

bu yerda: q_n - avtobusning sig‘imi, pass.;

Q_{max} - sutkaning har bir soatidagi to‘g‘ri va teskari yo‘nalishlar bo‘yicha maksimal passajirlar soni.

Sutka soatlari bo‘yicha harakat intervali:

$$I_a = \frac{t_{ayl}}{A_M} \cdot 60 \text{ ; min.}$$

O’NINCHI LABORATORIYA ISHIGA NAMUNA

Berilgan:

$l_м$=20 km; n_{ast}=26; t_{ay}=0,5 min; t_{ox}=5 min

Berilgan marshrutda avtobusning bir aylanish vaqti quyidagi formula orqali aniqlanadi:

$$t_{ayl} = 2 \cdot (\frac{l_M}{V_T} + n_{obs} \cdot t_{mit} + t_{mnt}) = 2 \times (\frac{20}{40} + 26 \cdot 0{,}5 + 5) = 37 \text{min} = 0{,}6 \, soat$$

bu yerda: l_M- marshrut uzunligi, km;

V_T- texnik harakat tezligi, km/soat;

t_{mit}- oraliq bekatda to‘xtash vaqti, min;

n_{ost} - oraliq bekatlar soni;

t_{mnt}- oxirgi bekatda turish vaqti, min.

Sutka soatlari bo‘yicha avtobuslar soni quyidagicha aniqlanadi:

$$A_M = \frac{Q_{max} \cdot t_{ayl}}{q_n};\ avt$$

bu yerda: q_n- avtobusning sig‘imi, pass.;

Q_{max} - sutkaning har bir soatidagi to‘g‘ri va teskari yo‘nalishlar bo‘yicha maksimal passajirlar soni.

$$A_{6-7} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{126 \cdot 0{,}6}{37} = 2\ avtom$$

$$A_{7-8} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{210 \cdot 0{,}6}{37} = 3\ avtom$$

$$A_{8-9} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{504 \cdot 0{,}6}{37} = 8\ avtom$$

$$A_{9-10} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{378 \cdot 0{,}6}{37} = 6\ avtom$$

$$A_{10-11} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{294 \cdot 0{,}6}{37} = 5\ avtom$$

$$A_{11-12} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{210 \cdot 0{,}6}{37} = 3\ avtom$$

$$A_{12-13} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{336 \cdot 0{,}6}{37} = 6\ avtom$$

$$A_{13-14} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{294 \cdot 0{,}6}{37} = 5\ avtom$$

$$A_{14-15} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{320 \cdot 0{,}6}{37} = 5\ avtom$$

$$A_{15-16} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{320 \cdot 0{,}6}{37} = 5\ avtom$$

$$A_{16-17} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{360 \cdot 0{,}6}{37} = 6\ avtom$$

$$A_{17-18} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{440 \cdot 0{,}6}{37} = 7\ avtom$$

$$A_{18-19} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{400 \cdot 0{,}6}{37} = 6\ avtom$$

$$A_{19-20} = \frac{Q_{max} \cdot t_{ayl}}{q_n} = \frac{200 \cdot 0{,}6}{37} = 3\ avtom$$

Sutka soatlari bo‘yicha harakat intervali:

$$I_a = \frac{t_{ayl}}{A_M} \cdot 60 \text{ ; min}$$

$$I_{6-7} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{2} \cdot 60 = 18 \text{ min}$$

$$I_{7-8} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{3} \cdot 60 = 12 \text{ min}$$

$$I_{8-9} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{8} \cdot 60 = 4,5 \text{ min}$$

$$I_{9-10} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{6} \cdot 60 = 6 \text{ min}$$

$$I_{10-11} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{5} \cdot 60 = 7,2 \text{ min}$$

$$I_{11-12} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{3} \cdot 60 = 12 \text{ min}$$

$$I_{12-13} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{6} \cdot 60 = 6 \text{ min}$$

$$I_{13-14} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{5} \cdot 60 = 7,2 \text{ min}$$

$$I_{14-15} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{5} \cdot 60 = 7,2 \text{ min}$$

$$I_{15-16} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{5} \cdot 60 = 7,2 \text{ min}$$

$$I_{16-17} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{6} \cdot 60 = 6 \text{ min}$$

$$I_{17-18} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{7} \cdot 60 = 5,1 \text{ min}$$

$$I_{18-19} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{6} \cdot 60 = 6 \text{ min}$$

$$I_{19-20} = \frac{t_{ayl}}{A_M} \cdot 60 = \frac{0,6}{3} \cdot 60 = 12 \text{ min}$$

Harakat intervali va avtobuslar soni yo'lovchilarni tashish turiga ko'ra o'zgaradi.

Laboratoriya ishi №11

MAVZU: TRANSPORT VOSITALARINING HARAKAT MIQDORI VA TARKIBINI ANIQLASH.

Ishning maqsadi. Real ko‘cha va yo‘l sharoitlarida transport vositalarining harakat miqdorini va tarkibini kuzatuv usulidan foydalanib aniqlash.

Topshiriq. Real ko‘cha va yo‘l sharoitlarida bir soatlik harakat miqdorini va tarkibini kuzatuv uslubidan foydalanib aniqlash.

Ishning bajarish joyi. Institut yaqinida joylashgan chorraxalar

Ishlatiladigan asbob uskunalar.

Qo‘l soati va maxsus tayyorlangan jadval.

Ushbu ishda talabalar transport vositalarining harakat miqdorini va tarkibini ko‘z bilan ko‘rib kuzatish (vizual) usuli bilan tanishadilar. Ko‘z bilan ko‘rib harakat miqdorini hisoblash usuli quyidagi tartibda amalga oshiriladi.

Buning uchun talabalar kichik guruhlarga bo‘linib, chorraxalarda kuzatuv olib borish orqali o‘tayotgan transport vositalarining sonini va turini aniqlaydilar va ma’lumotlarni 1-jadvalga qayd qiladilar.

Dars qoldirgan talabalar fanni qayta o‘zlashtirish uchun institut axborot-resurs markazida joylashtirilgan elektron uslubiy qo‘llanmadan, oldindan tayyorlangan videolavhalardan foydalanib, yoki kunni ikkinchi yarmida chorraxalarda dars yo‘q vaqtlarda yuqoridagi matnda tushuntirilgan tarzda o‘qituvchining topshirig‘iga binoan hisoblaydilar.

O‘tayotgan transport vositalarining harakat miqdorini ishchi jadvalga 1, 2, 3, 4, 5, 6, 7, 8, 9 raqamlar yozish yo‘li bilan qayd qilinadi. Qayd qilishning bu turi amalda bajarishga oson, shuningdek, keyingi hisob uchun ixcham va qulaydir.

1-jadval

Yo‘l va ko‘chaning nomi_____ Hisobga olish kuni_____20____y.

Haftaning kuni_____Harakatning yo‘nalishi_____

Hisob vaqti: boshlandi_____ Tugatildi_____

Hisobchining F.I.SH._____

Hisob vaqti soati	Yengil avtomo-billar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobus	Velomoto-transport	Jami
		2t	2-5t	5-8t	8t dan yuqori			
8^{00}-8^{05}								
8^{05}-8^{10}								
8^{10}-8^{15}								
8^{15}-8^{20}								
8^{20}-8^{25}								
8^{25}-8^{30}								
8^{30}-8^{35}								
8^{35}-8^{40}								
8^{40}-8^{45}								
8^{45}-8^{50}								
8^{50}-8^{55}								
8^{55}-9^{00}								
8^{00}-9^{00}								

Harakat miqdorini aniqlash uchun uzluksiz tekshirishda bir soatlik vaqtni har 5 daqiqa interval oralig‘ida 12 ta intervalga bo‘lib 1-jadvalga yozib boriladi. Olingan ma’lumotlarni qayta ishlab, transport vositalari harakat miqdorining 10, 15, 20 va 30 daqiqa oralig‘idagi qiymatlari, bir soatlik tanlab olingan harakat miqdorini hisoblash uchun 2-jadval ko‘rinishida yoziladi.

2-jadval

Variantlar	Yengil avtomo-billar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobuslar	Velomoto-transport	Jami
		2t	2-5t	5-8t	8t dan yuqori			

Vaqtning 15 daqiqalik intervallari	1 2 3 4								
Ekstri-mumlar	max								
	min								
R=									
N=									
Δ=									

Harakat miqdorini aniqlash uchun uzluksiz tekshirishda bir soatlik vaqtni har 5 daqiqa interval oralig‘ida 12 ta intervalga bo‘lib 1-jadvalga yozib boriladi. Olingan ma’lumotlarni qayta ishlab, transport vositalari harakat miqdorining 10, 15, 20 va 30 daqiqa oralig‘idagi qiymatlari, bir soatlik tanlab olingan harakat miqdorini hisoblash uchun 2-jadval ko‘rinishida yoziladi.

Bir soatlik harakat miqdorining tanlab olingan qiymatlarining statistik xususiyatlari quyidagi tartibda hisoblanadi:

1. Variatsion ko‘lamni aniqlash:

$$R = N^{10}soat(\max) - N^{10}_{soat}(\min), avt/soat$$

bu yerda:

$N^i(\max), N^i(\min)$ -bir soatlik harakat miqdorining eng katta va eng kichik qiymatlari, ular vaqt oralig‘idagi tanlab olingan variant;

i - 5, 10, 15, 20, 30 daqiqalik vaqt oralig‘i.

2. Bir soatlik harakat miqdorining vaqt oralig‘idagi o‘rtacha qiymatini topish:

$$\overline{N} = \frac{\sum_{1}^{K} N_{soat}}{K} \quad avto/soat$$

bu yerda: *K*-variantlar soni.

Bir soat ichidagi harakat miqdorining uzluksiz kuzatish vaqti 5, 10, 15, 20, 30 daqiqani tashkil etganda *K* ning qiymati shu sonlarga mos holda 12, 6, 4, 3 va 2 ga teng bo‘ladi.

3. Hisoblarning xatoligini aniqlash:

$$\Delta = \frac{N_{soat} - \overline{N}_{soat}}{N_{soat}}$$

Amaliy ishlarni boshlashdan oldin talabalarga, harakat miqdorini aniqlashning asosiy qoida va tartibi tushuntiriladi. Bunda 5ta jadval, 1ta gistogramma, 1ta siklogramma chiziladi.

O'N BIRINCHI LABORATORIYA ISHIGA NAMUNA

1-jadval

Yo'l va ko'chaning nomi: Mustaqillik ko'chasi

Hisobga olish kuni 12.03.2020y.

Haftaning kuni Chorshanba Harakatning yo'nalishi_____

Hisob vaqti: boshlandi:8^{00} Tugatildi: 9^{00}

Hisobchining F.I.SH._____

Hisob vaqti soati	Yengil avtomo-billar	Yuk avtomobillari yuk ko'tarish bo'yicha				Avtobus	Velomoto-transport	Jami
		2t	2-5t	5-8t	8t dan yuqori			
8^{00}-8^{05}	148	2				1		151
8^{05}-8^{10}	134	2						137
8^{10}-8^{15}	143	1	1			2		146
8^{15}-8^{20}	137	2				1		141
8^{20}-8^{25}	152	3						155
8^{25}-8^{30}	144	2	1					146
8^{30}-8^{35}	154	1				3		159
8^{35}-8^{40}	150	1						151
8^{40}-8^{45}	140	1	1			1		142
8^{45}-8^{50}	138	3						141
8^{50}-8^{55}	147	1				1		150
8^{55}-9^{00}	151	2	1					153
Jami:	1738	21	4			9		1772
Foizlarda	88%	0.9%	0.3%			0.8%		100%

2-jadval

Variantlar		Yengil avtomo-billar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobuslar	Velomoto-transport	Jami
			2t	2-5t	5-8t	8t dan yuqori			
Vaqtning 10 daqiqalik intervallari	1	282	4	1			1		288
	2	280	3	1			3		287
	3	296	5				0		301
	4	304	2	1			3		310
	5	278	4				1		283
	6	294	3	1			1		303
Ekstri-mumlar	max								310
	min								283
R=									27
N=									285
Δ=									0,83

1. Variatsion ko‘lamni aniqlash:

$$R = N^{10}soat(\max) - N^{10}_{soat}(\min) = 310 - 283 = 27 avt/soat$$

bu yerda:

$N^i(\max), N^i(\min)$ -Har 10 minutlik harakat miqdorining eng katta va eng kichik qiymatlari, ular vaqt oralig‘idagi tanlab olingan variant;

2. Bir soatlik harakat miqdorining vaqt oralig‘idagi o‘rtacha qiymatini topish:

$$\overline{N} = \frac{\sum_{1}^{6} N_{soat}}{K} = \frac{1772}{6} = 295 \quad avto/soat$$

bu yerda: *K*-variantlar soni.

K ning qiymati 6,

3. Hisoblarning xatoligini aniqlash:

$$\Delta = \frac{N_{soat} - \overline{N}_{soat}}{N_{soat}} = \frac{1772 - 295}{1772} = 0.833$$

3-jadval

Variantlar		Yengil avtomobillar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobuslar	Velomoto-transport	Jami
			2t	2-5t	5-8t	8t dan yuqori			
Vaqtning 15 daqiqalik intervallari	1	425	5	1		3			434
	2	433	7	1		1			442
	3	444	3	1		1			449
	4	436	6	1		4			447
Ekstri-mumlar	max								449
	min								434
R=									15
N=									443
Δ=									0.75

1. Variatsion ko‘lamni aniqlash:

$$R = N^{15}soat(\max) - N^{15}_{soat}(\min) = 449 - 434 = 15 \quad avt/soat$$

bu yerda:

$N^{15}(\max), N^{15}(\min)$ - Har 15 daqiqa vaqt davomidagi eng katta va eng kichik qiymatlari, ular vaqt oralig‘idagi tanlab olingan variant;

2. Har 15 daqiqa vaqt davomidagi harakat miqdorining vaqt oralig‘idagi o‘rtacha qiymatini topish:

$$\overline{N} = \frac{\sum_{1}^{4} N_{soat}}{K} = \frac{1772}{4} = 443 \quad avto/soat$$

bu yerda: *K*-variantlar soni 4

3. Hisoblarning xatoligini aniqlash:

$$\Delta = \frac{N_{soat} - \overline{N}_{soat}}{N_{soat}} = \frac{1772 - 443}{1772} = 0{,}75$$

4-jadval

Variantlar		Yengil avtomobillar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobuslar	Velomoto-transport	Jami
			2t	2-5t	5-8t	8t dan yuqori			
Vaqtning 20 daqiqalik intervallari	1 2 3	562 600 576	7 7 7	2 1 1			4 3 2		575 611 586
Ekstri-mumlar	max								611
	min								575
R=									36
N=									591
Δ=									0,66

1. Variatsion ko‘lamni aniqlash:

$$R = N^{20}soat(\max) - N^{20}_{soat}(\min) = 611 - 575 = 36 \quad avt/soat$$

bu yerda:

$N^{20}(\max), N^{20}(\min)$ -Har 20 minutlik harakat miqdorining eng katta va engkichik qiymatlari, ular vaqt oralig‘idagi tanlab olingan variant;

2. Bir soatlik harakat miqdorining vaqt oralig‘idagi o‘rtacha qiymatini topish:

$$\overline{N} = \frac{\sum_{1}^{3} N_{soat}}{K} = \frac{1772}{3} = 591 \quad avto/soat$$

bu yerda: *K*-variantlar soni 3.

3. Hisoblarning xatoligini aniqlash:

$$\Delta = \frac{N_{soat} - \overline{N}_{soat}}{N_{soat}} = \frac{1772 - 591}{1772} = 0,66$$

5-jadval

Variantlar		Yengil avtomobillar	Yuk avtomobillari yuk ko‘tarish bo‘yicha				Avtobuslar	Velomoto-transport	Jami
			2t	2-5t	5-8t	8t dan yuqori			
Vaqtning 20 daqiqalik intervallari	1 2	858 880	12 9	2 2			4 5		876 896
Ekstrimumlar	max								876

	min								896
R=									20
N=									886
Δ=									0,66

1. Variatsion ko‘lamni aniqlash:

$$R = N^{30}soat(\max) - N^{30}_{soat}(\min) = 896 - 876 = 20 \quad avt/soat$$

bu yerda:

$N^{30}(\max), N^{30}(\min)$ -Har 30 minutdagi harakat miqdorining eng katta va eng kichik qiymatlari, ular vaqt oralig‘idagi tanlab olingan variant;

2. Bir soatlik harakat miqdorining vaqt oralig‘idagi o‘rtacha qiymatini topish:

$$\overline{N} = \frac{\sum_{1}^{2} N_{soat}}{K} = \frac{1772}{2} = 886 \quad avto/soat$$

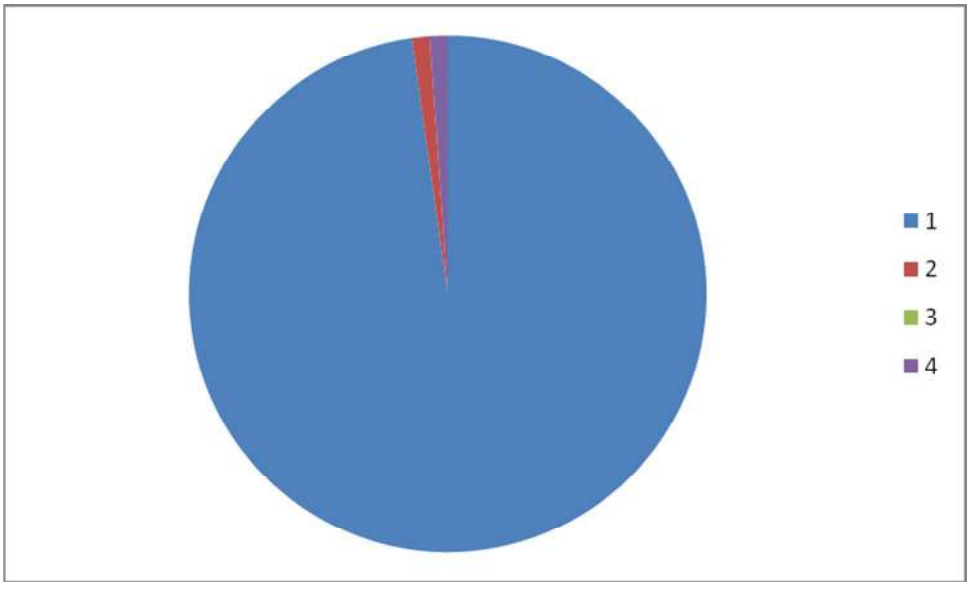
bu yerda: *K*-variantlar soni 2.

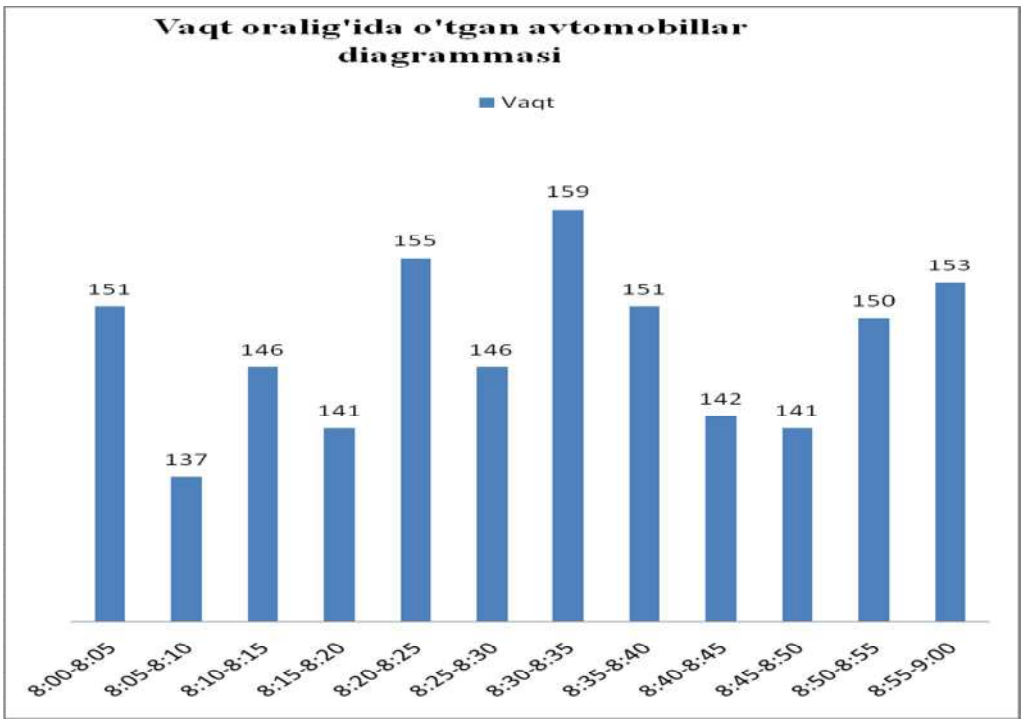
3. Hisoblarning xatoligini aniqlash:

$$\Delta = \frac{N_{soat} - \overline{N}_{soat}}{N_{soat}} = \frac{1772 - 886}{1772} = 0,5$$

Transport vositalarining harakat miqdori va tarkibini siklogrammasi

Yengil avtomobillar	Yuk avtomobillari		Avtobuslar
	2t	2-5t	
1	2	3	4
87,7%	1%	0.3%	1%





Xulosa: Har bir talaba o'zining natijalari asosida hulosa yozadi.

Laboratoriya ishi №12

MAVZU: TRANSPORT VOSITALARINING ONIY TEZLIGINI MAVJUD KO'CHA SHAROITIDA ANIQLASH VA TAHLIL QILISH.

Ishning maqsadi. Mavjud ko'chaning to'g'ri qismida transport vositalarining oniy harakat tezligini o'lchash.

Topshiriq. Jami 120 tadan kam bo'lmagan miqdorda yengil avtomobillarning oniy tezligini aniqlash va statistik usuli yordamida tahlil qilish.

Ishning bajarish joyi. Laboratoriya ishi, institut yaqinida joylashgan Mustaqillik va A.Navoiy ko'chalarida o'tkaziladi.

Ishlatiladigan asbob uskunalar.

Sekundomer va uzunlik o'lchovchi tasma.

Transport vositalarining harakat tezligini sekundomer bilan o'lchash uchun yo'lning chorraha va to'g'ri qismlarida ma'lum bir masofa belgilab olinadi. Asosan o'lchov masofasining uzunligi 50 m.dan (harakat tezligi kichik bo'lgan joylarda) -

150 metrgacha (harakat tezligi yuqori bo‘lgan joylarda) belgilanadi. Transport vositalarining kirish va chiqish vaqtini aniq belgilash uchun yo‘l yoqasiga oq-qora rangli bo‘yoq bilan bo‘yalgan ishora tayog‘i o‘rnatiladi yoki yo‘lning qatnov qismiga ko‘ndalang belgi chiziqlari tushiriladi. Kuzatuvchilar (talabalar) harakat tezligini o‘lchash uchun auditoriyaning derazalari oldida real ko‘cha sharoitida o‘tayotgan transport vositalarini yoki maxsus o‘rnatilgan kamera yordamida televizor ekraniga uzatilayotgan, shuningdek avvaldan olib qo‘yilgan videolavhalardagi transport vositalarining tezligini sekundomer yordamida aniqlaydilar. Kuzatuv natijalarini oldindan tayyorlangan jadvalga yozib boradi. Kuzatuvchi transport vositasining oldi bamperi o‘lchov chizig‘iga kirganda daqiqa o‘lchagichni ishga tushiradi va o‘lchov masofasidan chiqishda uni to‘xtatadi.

Tezlikni o‘lchashdan olingan qiymatlar 6-jadvalga yoziladi. Harakat tezligi to‘g‘risidagi natijalar matematik statistika usuli yordamida qayta ishlanadi. Olingan natijalarni statistik qayta ishlash misoli 4-jadvalda ko‘rsatilgan. Statistik tahlilning birinchi bosqichi bir-biriga eng yaqin qiymatlarni turkumlarga birlashtirishdan iborat. 7-jadval qiymatlaridan foydalanib taqsimot egriligi va jamlangan taqsimot egrilik grafiklari quriladi.

6-jadval

Avtomobillarning harakat tezligini aniqlash.

O‘lchash kuni_____ Ko‘chaning nomi_____

Yo‘l qatnov qismining kengligi_____m, qoplamaning turi_____

Ob-havo sharoitlari_____ O‘lchash masofasi _____

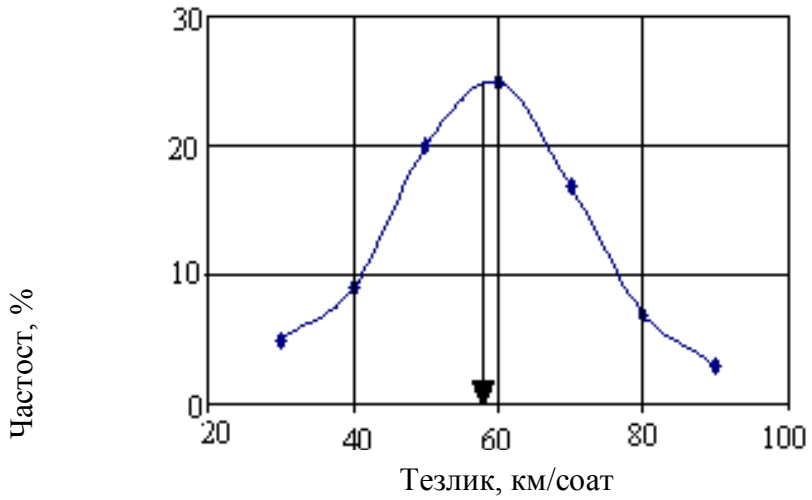
Transport vositalarining soni, dona	O‘tish vaqti,	Harakat tezligi	
	t, cek	V, m/sek	V, km/soat
1			
2			
3			
.			
.			
.			
.			

.			
120			

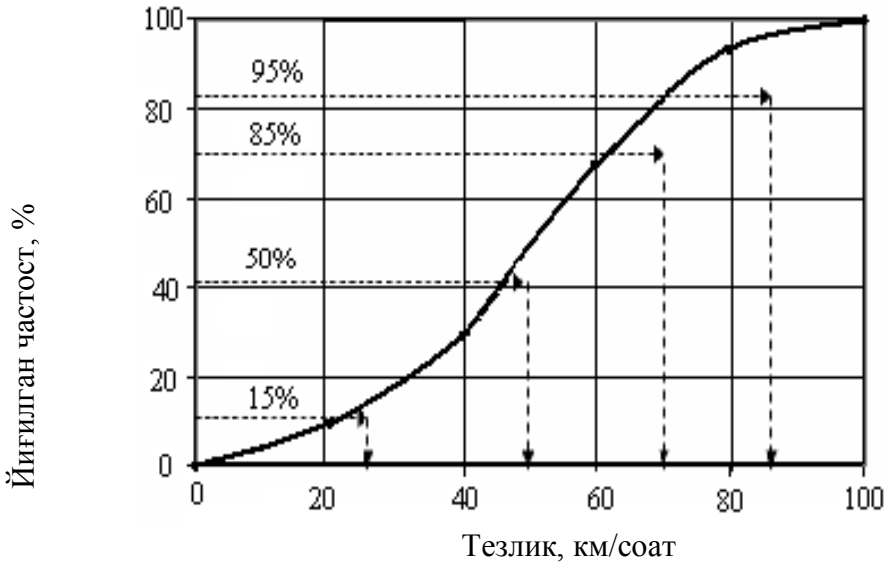
7-jadval

Turkumlar, km/soat	Takrorlanish, dona	Chastost, %	Yig‘ilgan chastost, %	Izoh
35-40 40-45 45-50 50-55 55-60 60-65 65-70 70-75 75-80 80-85				
	120	100,0		

a)



b)



1-rasm. Kuzatish natijalarining statistik qayta ishlanish grafiklari.
a) Taqsimot egriligi; b) Yig‘ilgan taqsimot egriligi.

Taqsimot egriligi yordamida avtomobillar harakat tezligining ko‘p qaytariladigan (modal) qiymati aniqlanadi. Yig‘ilgan egrilik yordamida 15,50,85,95% ta’minlanganlikdagi tezlik qiymatlari aniqlanadi.

O’N IKKINCHI LABORATORIYA ISHIGA NAMUNA

6-jadval

Avtomobillarning harakat tezligini aniqlash.

O‘lchash kuni Ko‘chaning nomi_____

Yo‘l qatnov qismining kengligi_____m, qoplamaning turi_____

Ob-havo sharoitlari_____ O‘lchash masofasi _____

Transport vositalarining soni, dona	O‘tish vaqti,	Harakat tezligi		Transport vositalarining soni, dona	O‘tish vaqti,	Harakat tezligi	
	t, cek	V, m/sek	t, cek		t, cek	V, m/sek	V, km/soat
1	6,6	15,2	55	61	6,7	14,9	54
2	6,9	14,5	52	62	5,6	17,9	64
3	6,4	15,6	56	63	6	16,7	60
4	6,3	15,9	57	64	8,3	12,0	43
5	5,1	19,6	71	65	5,6	17,9	64
6	5,7	17,5	63	66	6,2	16,1	58
7	7,8	12,8	46	67	5,9	16,9	61
8	9,3	10,8	39	68	7,6	13,2	47
9	5	20,0	72	69	6,4	15,6	56
10	6	16,7	60	70	6,5	15,4	55
11	7,1	14,1	51	71	6	16,7	60
12	8,3	12,0	43	72	7,8	12,8	46
13	7,2	13,9	50	73	5,9	16,9	61
14	6,8	14,7	53	74	6,4	15,6	56
15	4,2	23,8	86	75	7,1	14,1	51
16	5,6	17,9	64	76	7,3	13,7	49
17	8,1	12,3	44	77	5,9	16,9	61
18	7,8	12,8	46	78	6,4	15,6	56
19	6,7	14,9	54	79	6,9	14,5	52
20	6,5	15,4	55	80	6,2	16,1	58
21	8,3	12,0	43	81	5,6	17,9	64
22	9,4	10,6	38	82	6	16,7	60
23	4,2	23,8	86	83	7,6	13,2	47
24	4,7	21,3	77	84	6,4	15,6	56
25	10,2	9,8	35	85	6,5	15,4	55
26	10	10,0	36	86	6,8	14,7	53
27	9,1	11,0	40	87	5,9	16,9	61
28	9,4	10,6	38	88	6,2	16,1	58

29	7,3	13,7	49	89	7,3	13,7	49
30	6,7	14,9	54	90	5,9	16,9	61
31	6,8	14,7	53	91	6,5	15,4	55
32	5,6	17,9	64	92	6,9	14,5	52
33	7,1	14,1	51	93	5,6	17,9	64
34	7,6	13,2	47	94	6,4	15,6	56
35	6,3	15,9	57	95	7,1	14,1	51
36	5,9	16,9	61	96	5,9	16,9	61
37	6,2	16,1	58	97	7,6	13,2	47
38	6,4	15,6	56	98	6	16,7	60
39	8,1	12,3	44	99	6,5	15,4	55
40	8	12,5	45	100	6,9	14,5	52
41	6,9	14,5	52	101	4,8	20,8	75
42	7,3	13,7	49	102	5,1	19,6	71
43	6,4	15,6	56	103	5,6	17,9	64
44	6,1	16,4	59	104	4,9	20,4	73
45	5,1	19,6	71	105	5,3	18,9	68
46	5,6	17,9	64	106	5,1	19,6	71
47	9,7	10,3	37	107	5,9	16,9	61
48	6,8	14,7	53	108	4,9	20,4	73
49	9,3	10,8	39	109	5,5	18,2	65
50	9,2	10,9	39	110	4,8	20,8	75
51	9,3	10,8	39	111	5,3	18,9	68
52	8,3	12,0	43	112	5,1	19,6	71
53	7,8	12,8	46	113	5,5	18,2	65
54	6,4	15,6	56	114	5,6	17,9	64
55	5,9	16,9	61	115	4,6	21,7	78
56	5,6	17,9	64	116	5,3	18,9	68
57	8,1	12,3	44	117	4,9	20,4	73
58	6,5	15,4	55	118	5,9	16,9	61
59	7,1	14,1	51	119	5,5	18,2	65
60	6,4	15,6	56	120	4,6	21,7	78

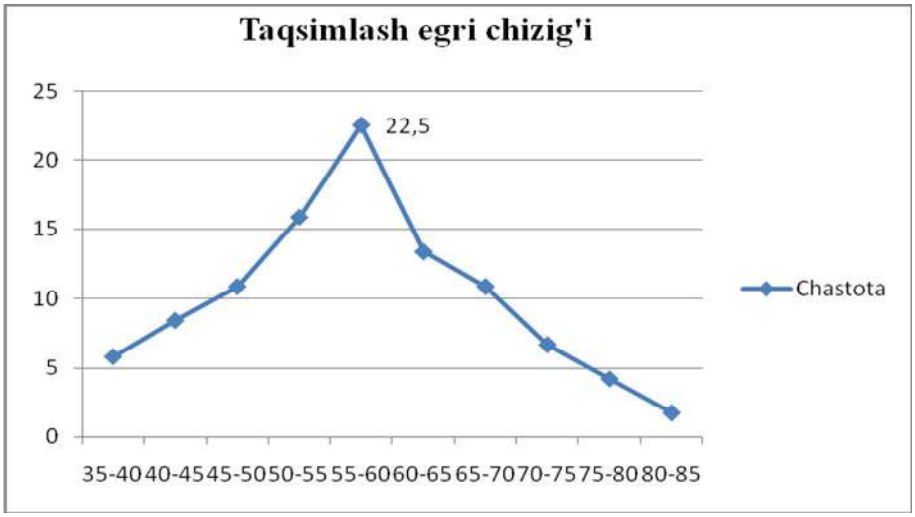
6- jadval asosida taqsimlash egri chizig'i va yig'ilgan chastost egri chizig'i jadvali tuzuladi.

7-jadval

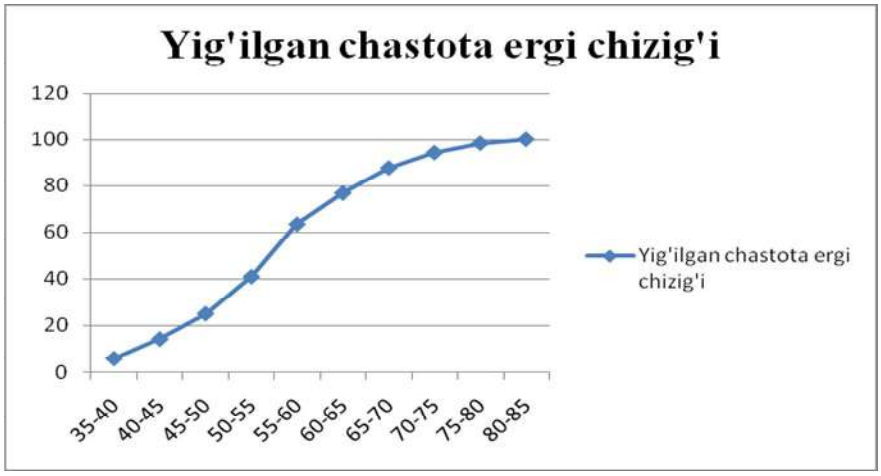
Turkumlar, km/soat	Takrorlanish, dona	Chastost, %	Yig'ilgan chastost, %	Izoh
35-40	7	5,8	5,8	
40-45	10	8,4	14,2	
45-50	13	10,84	25,04	
50-55	19	15,84	40,88	
55-60	27	22,5	63,38	
60-65	16	13,34	76,72	
65-70	13	10,84	87,56	

70-75 75-80 80-85	8 5 2	6,67 4,17 1,7	94,23 98,3 100	
	120	100,0		

7- jadval asosida taqsimlash egri chizig'i va yig'ilgan chastost egri chizig'i grafigi quruladi.



1-rasm. Taqsimlash egri chizig'i grafigi



2-rasm. Yig'ilgan chastota egri chizig'i grafigi

Xulosa. Talabalar bajarilgan ishlar bo'yicha o'z xulosalarini yozadi. V_{mod} tezlik qiymatini va $V_{15}, V_{50}, V_{85}, V_{95}$% ta'minlanganlik tezligini aniqlashadi

Laboratoriya ishi №13

MAVZU: PIYODALAR HARAKAT OQIMINI ANIQLASH VA TAHLIL QILISH.

Ishning maqsadi. Ko‘cha va yo‘llarda piyodalar oqimi harakatini o‘rganish.

Topshiriq. Piyodalar harakat oqimini hisoblash, aniqlangan ma’lumotlarni tahlil qilish.

Ishning bajarilish joyi. Institut yaqinida joylashgan Mustaqillik va A.Navoiy ko‘chalari.

Ishlatiladigan asbob uskunalar.

Sekundomer, uzunlik o‘lchovchi tasma.

Piyodalarning harakat oqimini o‘rganish uslubi quyidagilardan iborat:

Real yo‘l-ko‘cha sharoitinig amaldagi transport va piyodalar harakatini tashkil etishda texnik boshqaruv vositalari bilan jihozlanish holatini sxemasini chizish. Chizmaga barcha yo‘l belgilari, yo‘l belgi chiziqlari, svetoforlar, yo‘naltiruruvchi to‘siqlar va boshqa harakatni tashkil etish vositalarini ma’lum masshtabda ko‘rsatish.

Piyodalar o‘tish joyidagi qarama-qarshi yo‘nalishda yo‘lni kesib o‘tayotgan yoki trotuarda qarama-qarshi harakatlanayotgan piyodalarni bir vaqtning o‘zida alohida hisobga olish. Buning uchun hisobchi shunday joylashish kerakki chorrahada yoki yo‘l bo‘lagidagi transport va piyodalarni harakatlanish vaziyatini aniq ko‘rishi darkor.

Piyodalar harakat miqdorini hisoblash uchun oldindan tayyorlangan maxsus varaqaga (8-jadvalga) yozib boriladi.

8-jadval

Chorraha nomi_____ Post №_____

Sanash vaqti_____ Sanovchining familiyasi_____

Harakat yo‘nalishi	Kuzatish vaqti	Kuzatish vaqtidagi piyodalar soni
Institut-bank	8^{00}-8^{10}	45
Bank-institut	8^{00}-8^{10}	34

Talaba auditoriyaning derazasidan yoki televizor ekranidagi videolavhalardan foydalanib kichik guruhlarga bo‘linib, hisobni 1 soat davomida olib borish maqsadga

muvofiqdir. Shu soatdagi piyodalar harakatining vaqt ichida bir xil emasligini hisobga olish uchun soatni bo‘laklarga bo‘lgan holda ya’ni 15, 10 yoki 5 daqiqalik interval qabul qilinadi. Har bir talaba o‘zining hisob varaqasini alohida to‘ldiradi va ishning yakunida barcha varaqalar jamlanib tahlil qilinadi va xulosa natijalari yozib qo‘yiladi. Kelgusida shu yo‘lning qismida hamda chorrahada harakat xavfsizligini ta’minlashda, yo‘lga belgi chiziqlari chizishda, svetofor, yo‘l belgilari, piyodalar to‘siqlari o‘rnatishda va harakatni tashkil etishda olingan ma’lumotlardan foydaniladi. Talaba qayta o‘zlashtirish uchun institutning axborot resurs markazidan berilgan piyodalar o‘tish joylarida piyodalarning harakatini kuzatish orqali qoldirgan darslarini qayta o‘zlashtirishlari mumkin.

O’N UCHUNCHI LABORATORIYA ISHIGA NAMUNA

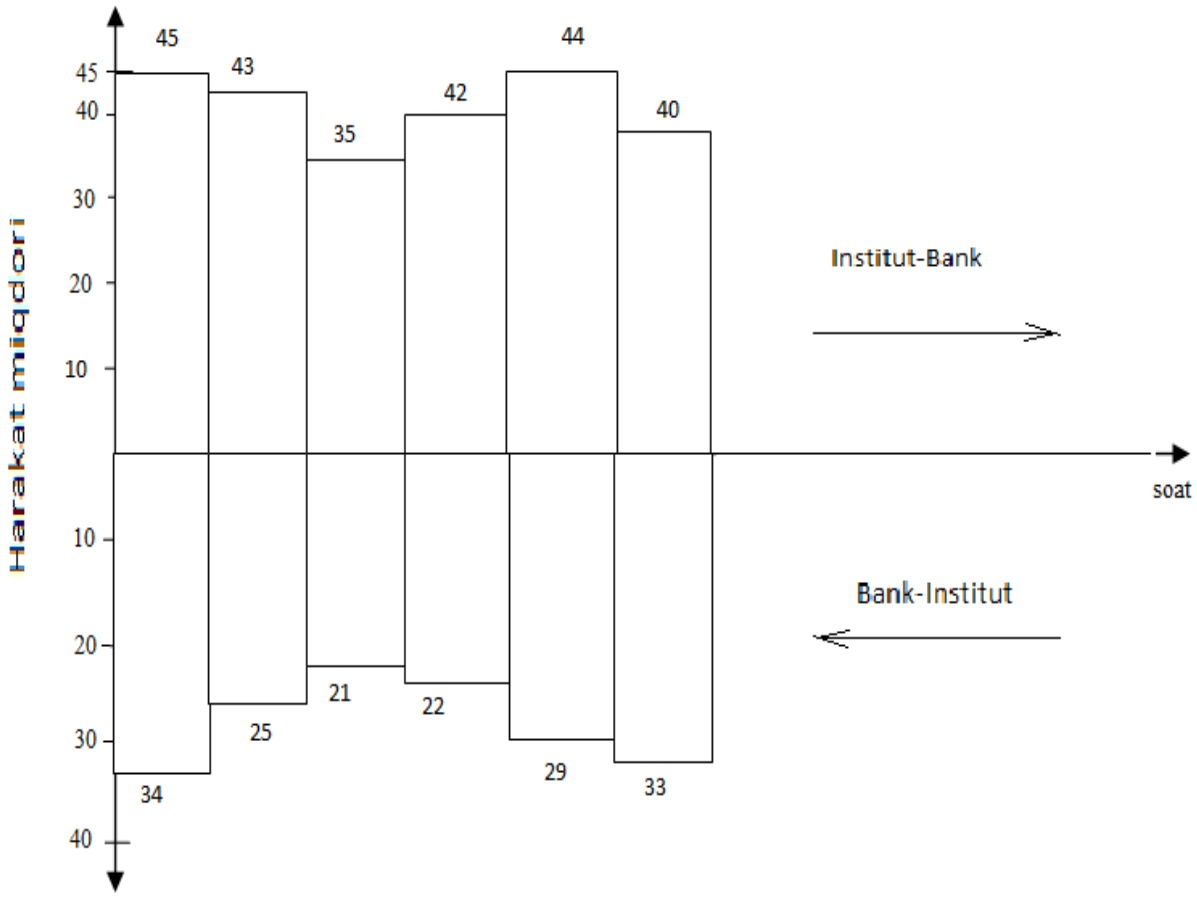
8-jadval

Chorraha nomi: Ipoteka bank-Institut Post №1

Sanash vaqti: 8:00 dan 9:00gacha Sanovchining familiyasi: Jovliyev V.U.

Harakat yo‘nalishi	Kuzatish vaqti	Kuzatish vaqtidagi piyodalar soni
Institut-Bank	8^{00}-8^{10}	45
Bank-Institut	8^{00}-8^{10}	34
Institut-Bank	8^{10}-8^{20}	43
Bank-Institut	8^{10}-8^{20}	28
Institut-Bank	8^{20}-8^{30}	35
Bank-Institut	8^{20}-8^{30}	21
Institut-Bank	8^{30}-8^{40}	43
Bank-Institut	8^{30}-8^{40}	22
Institut-Bank	8^{40}-8^{50}	44
Bank-Institut	8^{40}-8^{50}	29
Institut-Bank	8^{50}-8^{60}	40
Bank-Institut	8^{50}-8^{60}	33

Piyodalar harakat miqdorini vaqt ichida o’zgarish kartogrammasi



Laboratoriya ishi №14

MAVZU: YO'L HISOBGA OLISHNING BIRLAMCHI HUJJATLARINI TUZISH VA TAHLIL QILISH.

Ishning maqsadi. YTHni hisobga olishning birlamchi hujjatlari bilan tanishuv. YTH kartochkasini to'ldirish.

Topshiriq. YTH kartochkasini to'ldirish. Kod axborotlarini rasshifrovka qilish.

Ishning bajarish joyi. Real ko'cha-yo'l sharoiti o'quv laboratoriyasi.

Ishlatiladigan asbob-uskunalar. YTHning kartochkasi**.**

Bu labarotoriya ishida o'qituvchining topshirig'iga asosan YTH kartochkasiga hodisaning yozma ravishdagi bayonini yozish va millimetrovka qog'ozida M: 1:200 masshtabda YTH chizmasini chizish kerak.

Misol: YTH bayoni.

12 fevral 2018 yil soat 19^{50}. Mustaqillik ko'chasida «TIKO» yengil avtomobili haydovchisi tomonidan piyodani bosib ketish hodisasi sodir qilingan. Piyodaning yoshi 22 da.

Avtomobil to'g'ri yo'nalishda, asfaltobeton qoplamali gorizontal tekis yo'lda harakatlangan. Yo'lning qatnov qismini kengligi 10,5-11 metr. Piyodani bosib ketish sutkaning qorong'i vaqtida sodir bo'lgan.

Bulutli, yog'ingarchilik ob-havo, toyg'onchoq, yo'l yoritilmagan. Toliqqan holda haydovchi xavfli sharoitda harakat tezligini oshirgan.

Belgilangan joyda yaqin harakatlanayotgan transportning oldidan piyoda yo'lni kesib o'tgan. II-toifa haydovchisi, mehnat faoliyati 10 yildan oshiq, yoshi 40 da, hodisa 12 ish soatida sodir bo'lgan.

YTHini hisobga olish kartochkasini to‘ldirish uchun jadval.

1. Umumiy ma’lumotlar a. Kartochka turi 1-birinchi bor aniqlangan 2-so‘roqqa javob 3-o‘zgartirilgan kartochka 4-bekor qilingan kartochka b. Hodisa turi 1-to‘qnashuv; 2-ag‘darilish; bosib ketish 3. Turgan TV 4. To‘siq 5. Piyoda 6. Velosipedist 7. Kaja vali transport 8. Haydovchi 9. Boshqa hodisalar. *2.YTHining aholi punktidagi joyi.* a. Aholi punkti status 1.Respublika,vilovt markazi. 2. Respublika, viloyatga tegishli shahar. 3. Rayonga tegishli 4. Posyolka, qishloq	*4. Yo‘l sharoiti* *a) Qoplama turi va qatnov qismi holati* Qattiq Gruntli qoplama 1-quruq 4-quruq 2-xo‘l 5-xo‘l 3-muzlagan 6-muzlagan *b) Yoritilganlik* 1-Kunduz kuni Sutkaning qorong‘i paytidagi yoritilganlik 2-qo‘shilgan 3-qo‘shilgan 4-yoritgigchlar yo‘l *v)Yo‘l va ko‘cha elementlari* 1-ko‘prik (yo‘l o‘tkazgichlar; estakada) 2-Umum foydalanuv transporti to‘xtash zonasi 3. Piyodalar o‘tish joyi 4.Chorraha,boshqariladigan ASBT (ASUD) 5.Boshqariladigan chorraha 6.Boshqarilmaydigan chorraha 7.Shlagbaumli temir yo‘l preyezdi 8. Shlagbaumsiz temir yo‘l	G. YTHga sabab bo‘lgan sharoitlar 1-sirpanchiq qoplama 2-norovon qoplama 3-yo‘l yoqasi talab doirasida emas. 4-ko‘prik gabariti qatnov qismi eniga mos kelmaydi 5-temir yo‘l preyezdi talab doirasiga mos kelmaydi. 6-daraxt, yoritgich tayanchi 7-tratuar, piyodalar o‘tish joyining yo‘qligi 8-xavfli yo‘l uchastkalarini chegaralanmaganligi 9-qatnov qismining to‘la yoritilmaganligi 10-ishlab chiqarish joyini chegaralan-maganligi va signalizag‘iya yo‘qligi 11-yo‘l belgilarining yo‘q-ligi yoki ularning noto‘g‘ri o‘rnatilganligi 12-svetoforning nosozligi va uni ko‘rish yomonligi 13-gorizantal ajratuvchi yo‘l chiziqlari-ning yo‘qligi yoki ularning ko‘rinishi yomonligi 14-boshqa sharoitlar *5.Piyodalarnin YHQini buzishi* 1-qatnov qismi orqali o‘tgan o‘tish joyining noto‘g‘ri qo‘yilganligi 2-yo‘l harakati boshqaruv signaliga e’tiborsizligi 3-TV orqasidan kutilmagan chiqib qolish,	6.Aybdor haydovchilar haqida ma’lumotnoma a) Kvalifikag‘iyasi 1-TVini boshqarish uchun kategoriyasi mos keladi. 2-TVini boshqarishga haqi yo‘q 3-YTHi joyidan qochmoq *b)YHQini buzish (haydov-chi,velosipelist tomonidan)* 01-Tvini mas holda boshqarish 02-Tezlikni oshirgan, (yo‘l belgilari va YQQiga amal qilmasdan tezlikni oshirish) 03-Boshqaruv signaliga rioya qil-magan, yo‘l belgisi va ajratuvchi yo‘l chiziqlariga e’tiborsizligi Qoidani buzishlar 04-odam tashish 05-manyovrganligi 06-piyodala o‘tish joyidan yurishi 07-Umum foydalanuv tansporti yurish joyidan yurishi 08-Yorituvchi asboblardan foy-sh 09-Tvlarini to‘siqsiz joylar-da,o‘tish joylarida qoldirish, ya’ni imtiyoz yurish joylarida qoldirishi. 10-Tvlarini to‘xtash joylari o‘tish, yurish	16-Oraliq masofaga e’tiborsizlik 17-rulda uxlab qolish va toliqish 18-TVlarini nosoz holda boshqarish, ya’ni ekspluа-tag‘iyada taqiqlangan sharoitda boshqarish 19-Boshqa YHQ buzish 7.*Tvi haqida ma’lumotnoma.* a) Pritsyepli yoki yarim pritsepli 1- ha 2-yo‘q b) YTH si sodir etilishiga sabab bo‘luvchi Tvining nosozligi 1-tormoz sistemasi, (ishchi tormoz sistemasi) 2-rulq boshqarmasi 3-G‘ildirak (yirtilishi, ajralishi) 4.shina (protektorning yeyilishi, yorilishi) 5-lampali signalli yoritgich asboblari 6-Ilashish tuzilmasi 7-Konstruktsiyasining boshqa elementlari 9. Jarohatlanganlar haqida ma’lumotnoma a) Yo‘l harakati qatnashchilarining kategoriyasi 1-haydovchi

5. Boshqa aholi punkti *3.YTHining yo'ldagi joyi.* A. Yo'lning ahamiyati. 1. Umumiy davlat 2. Respublika 3. Viloyat (o'lka) 4. Mahalla 5. Boshqa joylarda	preyezdi 9. 3 m dan katta tepalik	daraxt orqasidan chiqib qolish 4-qatnov qismida o'ynash 5 7 yoshgacha bo'lgan piyodalarning boshlovchisiz yurishi 6-mast holda yurishi 7-boshqa YHQini buzish	12-Yuk tashish 13-Buksirovka qilish 14-Qarama-qarshi polosaga chiqish va quvib o'tish 15-Chorrahada yo'l qoidasi va navbatni o'tib ketishga e'tibor bermaslik	4-velosipedchi 2-yo'lovchi 5- 3-piyoda 6-boshqa qatnashchilar b) Xavfsizlik remeni 1-taqilgan 2-taqilmagan 10. Qo'shimcha ma'lumotlar.

Yo'l-transport hodisasini hisobga olish kartochkasi

1.Umumiy ma'lumotlar
kartochka nomeri №1
a) kartochka turi 1
b) hodisa turi 2
2_oy 12_kun 2_hafta 19:50 soat
qo'shimcha kartochka nomeri28291
2.Aholi punkti statusi Qarshi shahri Mustaqillik ko'chasi

3.YTH ni yo'ldagi joyi Qarshi shahri Mustaqillik ko'chasi
a) yo'lning ahamiyati 1
4. Yo'l sharoiti
a)qoplama turi va qatnov qismi holati 3
b) yoritilganlik 1
v) ko'cha va yo'l elementlari 4
g)YTH ga yordam beruvchi sharoitlar 1
5.Piyodalarning qoida buzishi 3

6.Aybdor haydovchilar haqida ma'lumotnoma	1 TV	2 TV	3 TV
a) klassifikatsiyasi	II		
Yoshi	40		
Jinsi: erkak (1)	1		
Staji (yil)	10		
YTHgacha rulda bo'lgan vaqti	5		
b)YTHni buzganlar (haydovchi,velosipedchi)	02		
7TVsi haqida ma'lumot			
a)pritsiyep yoki yarim pritsiyep	01		
b)YTHni sodir bo'lishiga yordam beruvchi			

8. TVsining kimga tegishliligi	Birinchi TV	Ikkinchi TV	Uchinchi TV
Haydovchining ismi, familiyasi otasining ismi, guvohnoma nomeri	Saidov Adham Ismoilovich		
Markasi,nomer belgisi,texnik pasportining nomeri va seriyasi	TICO 70A 484AA		
Vazirlik, tashkilot, korxona, ish joyi, yashash joyi	Qarshi shahar Paxtazor mitti tumani		
hududga tegishli (respublika,viloyat, nohiya)	Qashqadaryo		

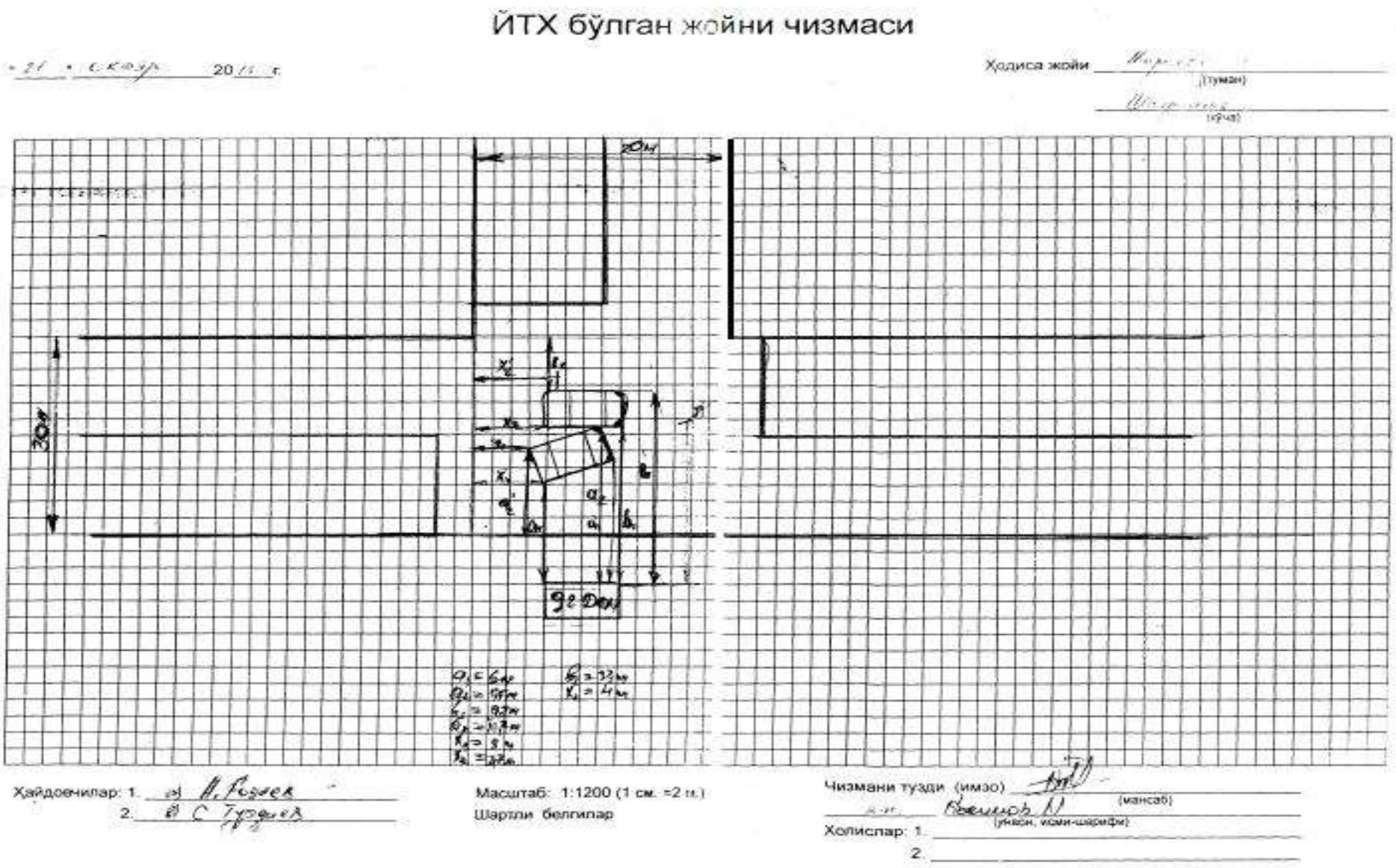
9.Jarohatlanlar haqida ma'lumotnoma			
O'lganlar (YTH da hammasi bo'lib) Jarohatlangar (hammasi bo'lib)	Jarohat olganlar		
	1-nchi	2-nchi	3-nchi
O'lgan (1) Jarohatlangan (2)	1		
a)Yo'l harakat qatnashchisi kategoriyasi			
Jinsi: erkak (1) ayol (2)	1		
Yoshi	22		
Tvlarining tartib nomeri			
b) xavfsizlik remeni			
Familiyasi, ismi, otasining ismi			
Uy adresi			
Qayerga jo'natilgan, jarohat xarakteri			

10.Qo'shimcha ma'lumotlar
Haydovchiing charchaganligi, ko'p vaqt ro'lda bo'lganligi.

11.YTH sxemasi va tasvirlash (tasviri)

12.Ko'riladigan choralar

Kartochka tuzgan Qosimov N.Sh
SHIIB nomeri bo'yicha
SHIIB boshligi_____berilgan №_____
Sana:12.02.2018



YTH sxemasi va tasvirlash (tasviri)ga misol (SHIIB xodimi tomonidan tasvirlangan)

Laboratoriya ishi №15

MAVZU: YO‘L VA KO‘CHA SHAROITLARIDA O‘RNATILGAN TEXNIK VOSITALARINI O‘RGANISH.

Ishning maqsadi. Harakatni tartibga solishda qo‘llaniladigan texnik vositalar bilan tanishuv va ularni normativ hujjatlariga asosan qo‘llanishini o‘zlashtirish.

Topshiriq. 1. Berilgan chorraha va yo‘l bo‘lagining sxemasini tuzish.

2. Texnik vositalarni normativ hujjatlarga asosan chorrahaga yo‘l bo‘lagiga o‘rnatish.

I**shning bajarilish joyi.** Transport va piyodalar harakat oqimining jadalligi yuqori bo‘lgan shahar ko‘chalari tarmog‘i va chorrahalarda (instituti atrofida).

Ishlatiladigan asbob uskunalar. Ruletka, planshet.

Svetoforlarni chorrahada va piyodalar yo‘laklarida o‘rnatilishi zaruriyati transport va piyodalar oqimini o‘zaro kesishuvidagi jadalliklarini va YTH sonini normativ hujjat 23457-86 davlat namunasida berilgan soni bilan solishtirish natijasida aniqlanadi. GOST 10807-78 yo‘l belgilari va GOST 13508-74 chiziq belgilari yo‘llarga o‘rnatilish va chizilish GOST 23457-86 ga asosan olib boriladi.

Topshiriqlarni bajarish uchun berilgan ko‘chaning va chorrahaning geometrik parametrlarini va u yerdagi transport va piyodalar harakat oqimini amaldagi tartibiga solish jarayonini ko‘rib chiqib ularni sxemasini chizish lozim. Oldin bajarilgan ishlarga asoslangan holda transport va piyodalar harakat miqdorini ko‘rib chiqib ularni GOST 23457-86 da berilgan qiymatlar bilan solishtirib chorrahada svetofor o‘rnatish kerak yoki kerak emasligiga xulosa chiqariladi. Berilgan yo‘lda o‘rnatilgan belgilarning va chizilgan chiziqlarni GOST 23457-86 da ko‘rsatilgan talablar bajarilishini tekshirib xulosa yozilinadi.

Hisobot tarkibi

1. Chorrahaning mavjud chizmasi.
2. Normativ xujjatlarga asosan chorrahaga o‘rnatiladigan texnik vositalar chizmasi.
3. Xulosa.

Laboratoriya ishi №16

MAVZU: HAYDOVCHINING DIQQATINI TADQIQ QILISH.

Ishning maqsadi. Haydovchining psixofiziologik xususiyatlaridan biri-diqqatni tadqiq qilish usuli bilan tanishish.

Topshiriq. 1. Oddiy variant Shulte-Platonov jadvalini tuzish

2. Tekshirish natijasida diqqatni baxolash.

Diqqat inson ongining biror narsa yoki xodisaga jamlanishidir. Haydovchining diqqati pasayishi sababli ko‘pincha yo‘l-transport xodisalari sodir etilmoqda. Diqqatni blankalar, maxsus asboblar yoki kompyuterda tadqiq qilish mukin. Diqqatni tekshirish bilan haydovchining avtomobilni boshqarishga xavfli psixofiziologik xolatini aniqlash va uni oldini olish imkoniyatini beradi.

Diqqatni Shulte-Platonov jadvali yordamida taqiq qilish.

Bu usul haydovchi diqqatining xususiyatlarini (hajmi, taqsimlanishi va ko‘chirilish tezligi), operativ xotirasi va emotsional tursunligini aniqlash imkoniyatini beradi. Jadvalda 49 katakda qora va qizil raqamlar yozilgan.

Bu usulda tekshirishda haydovchining vazifasi navbat bilan qora raqamlarni o‘sish, qizil raqamlarni kamayish tartibida qidirib topishdan iborat. Tekshiruv oddiy va murakkab variantli jadvallar bilan bajariladi. Jadvalning oddiy varianti 25 ta qora, 24 ta qizil raqamlardan iborat. Tekshirishda haydovchi uchta topshiriq bajaradi. 1-topshiriq-qora raqamlarni 1 dan 25 gacha topish, o‘qish va ko‘rsatkich bilan ko‘rsatish. 2-topshiriq-qizil raqamlarni 24 dan 1 gacha topish. 3-topshiriq-raqamlarni diqqatni ko‘chirib (rangini almashtirib) topish. Tekshiriluvchi qora raqamlarni o‘sish, qizil raqamlarni kamayish tartibini almashtirib (1 qora, 24 qizil, 2 qora, 23 qizil; 3 qora, 22 qizil va hakozo) topadi; Jadvalning murakkab varipantining iborat bo‘lib, oddiy variantdan farqi qora raqamlarni toq sonlardan iboratligidadir (1,3,5,7..49). Xar bir topshiriqni bajarish vaqti, yo‘l qo‘yilgan xatoliklar va uzoq to‘xtab qolishlar soni aniqlanadi.

Diqqatni baxolash xar bir topshiriqni bajarish vaqti, ko‘chirish vaqti va xatolar soni bilan baxolanadi. Ko‘chirish vaqti 1 va 2 topshiriqni bajarish vaqtlarini qo‘shib, 3-topshiriqni bajarish vaqtidan ayirish bilan aniqlanadi.

Murakkab variantli jadval bilan diqqatni tekshirishda quyidagi baxolash mezonidan foydalanish mumkin: topshiriqni bajarish vaqtni 170 s va kam-«a’lo» 171-240 s-«yaxshi»; 241-310 s«qoniqarli», 311-380 s-«qoniqarsiz»; 380 s va ko‘p-«juda qoniqarsiz». Har bir yo‘l qo‘yilgan xato uchun topshiriqni bajarish vaqtiga 5 s qo‘shiladi.

«SHULTE-PLATONOVA» QORA QIZIL JADVAL

24	9	1	16	13	6	5
18	2	2	15	4	22	23
17	10	19	16	13	7	8
12	7	23	4	1	20	21
11	25	6	5	12	24	14
9	3	10	11	3	20	18
21	15	14	19	22	8	17

Hisobot tarkibi.

1. Topshirishni bajarish vaqti bo‘yicha diqqatni baxolash.
2. Ko‘chirish vaqti bo‘yicha diqqatni baxolash.
3. Oddiy variantli Shulte-Platonov jadvalini tuzish.

Laboratoriya ishi №17

MAVZU: DIAGNOSTIKA MARKAZIDA TRANSPORT VOSITALARINI TEXNIK KO‘RIKDAN O‘TKAZISH.

17.1. Texnik ko‘rik hujjatlarini to‘ldirish va diagnostikamarkazi bilan tanishish.

Ishning maqsadi. 1. Transport vositalarini davlat texnik ko‘rigidan o‘tkazish qoidalari bilan tanishuv va ko‘rik hujjatlarini rasmiylashtshrish.

Topshiriq. 1. Transport vositalarini davlat texnik ko‘rigidan o‘tkazish qoidalari bilan tanishish.

2. Texnik ko‘rikdan o‘tkaziladigan mexanizm va qismlar, hamda ko‘rik hujjatlarini to‘ldirish.

3. Diagnostika markazining bosh rejasi bilan tanishish.

I**shning bajarilish joyi.** Toshkent shahri IIBB YQXBga qarashli Diagnostika markazi

Transport vositalarini texnik ko‘rikdan o‘tkazish jarayonida ma’lum hujjatlar to‘ldiriladi. Hujjatlar texnik ko‘rik o‘tkazish jarayoni davomida bosqichma-bosqich to‘ldirib boriladi. Transport vositalarining davlat raqami belgisi, shassi, kuzov va dvigatelning raqamlari tekshiriladi.

Agar transport vositalari korxona xodimlari tomonidan o‘tkazilsa, ular 1-namuna shaklida rasmiylashtiriladi.

Talabalar ishni texnik ko‘rikdan o‘tkazish qoidalari va tartibi bilan tanishishdan boshlaydilar. Shundan so‘ng diagnostika markazining bosh rejasi bilan tanishib chiqadilar va uning chizmasini chizadilar. Chizmada barcha «Ko‘rish joylari» va ularning nomi, postlarga o‘rnatilgan asbob-uskunalar ko‘rsatiladi.

Hisobot tarkibi

1. Texnik ko‘rikdan o‘tkazish muddatlari va o‘tkaziladigan mexanizm va qismlar ro‘yxati.
2. Diagnostika markazida qo‘llanadigan hujjatlarni to‘ldirilgan namunasi.
3. Diagnostika markazining bosh rejasi.

1-namuna

_____ _____

(korxona, tashkilot) (lavozimi)

_____ _____

manzili imzo. F.I.SH.

_____ _____ 200__y

Transport vositalarini texnik ko‘rikdan o‘tkazish natijalari haqida

M A ‘ L U M O T N O M A

_____ _____20__y

_____asosan_____dan_____gacha

(buyruq) (sana) (sana)

_____ta DANning hisobida turgan transport vositalari komissiya tomonidan texnik

(sana) ko‘rikdan o‘tkaziladi.

1. Texnik ko‘rikda_____ta transport vositasi taqdim etiladi.

1	2	3	4	5	6	7	8	9	10	11

Texnik ko‘rikdan_____transport vositasi o‘tdi

Texnik ko‘rikdan_____transport vositasi o‘tmadi

shu jumladan:

ta’mirlashda_____

kapital ta’mirlashda_____

17.2. Transport vositalarini tormoz tizimini ko‘rikdan o‘tkazish.

Ishning maqsadi. Tormoz tizimining samaradorligini aniqlashda qo‘llaniladigan asbob va qurilmalar bilan amalda tanishish va ular yordamida tormoz tizimining texnik qolatini tekshirish.

Topshiriq. 1. Tormoz tizimining samaradorligini belgilab beruvchi meyoriy qujjatlar bilan tanishish.

2. Tormoz tizimining samaradorligini baqolashda qo‘llaniladigan asbob va qurilmalar bilan tanishish.

3. Tormoz tizimining samaradorligini baqolash.

I**shning bajarilish joyi.** Toshkent shaqar IIBB YQXBga qarashli Diagnostika markazi

Ishlatiladigan asbob uskunalar: «Chopuvchi baraban»

1. Avtoxo‘jaliklarda tormoz tizimini tekshirish.

Avtomobil xo‘jaliklarida qaydovchi ishga chiqishdan oldin tormoz tizimining texnik qolatini ko‘zdan kechirib chiqiladi, shundan keyin maxsus maydonchada tormoz yo‘lining uzunligi aniqlanildi.

Avtomobil 40km/soat tezlikda kelib tormoz berish chizitsiga yetganda, qaydovchi avtomobilni shoshilinch ravishda to‘xtatadi va tormoz yo‘lining uzunligi o‘lchanadi. Tormoz yo‘lining uzunligi O‘zDSt 1058-2004, O‘zDst 1057-2004 davlat namunasiga mos kelsa, tormoz tizimining texnik qolati qoniqarli qisoblanadi.

2. «Chopuvchi baraban» bilan transport vositalarining tormoz tizimining texnik qolatini tekshirish.

Maxsus postlarda quyidagilar aniqlanadi: tormoz tizimining tashqi texnik qolati; orqa sildiraklardagi tormoz kuchi va ularni ng bir xilligi; to‘xtatib turuvchi tormoz tizimining samaradorligi; tormoz tizimining ishga tushish vaqti. Aniqlangan ko‘rsatkichlar 6-jadvalda qayl etiladi va meyoriy ko‘rsatkichlar bilan solishtiriladi

9-jadval

Tekshirilayotgan TV, uning davlat raqami	Davlat namunasi bo‘yicha		Tajribada aniqlangan	
	Asosiy tormoz tizimi	To‘xtatib turuvchi tormoz tizimi	Asosiy tormoz tizimi	To‘xtatib turuvchi tormoz tizimi

Hisobot tarkibi:

1. 9-jadval to‘ldiriladi:
2. Xulosa

17.3. Transport vositalarining ekologik xavfsizligini aniqlash.

Ishning maqsadi. Transport vositalarining ekologik xavfsizligini baholashni o‘rganish.

Topshiriq. 1. Transport vositalarning ekologik xavfsizligini aniqlashda qo‘llaniladigan asbos va uskunalar bilan tanishish.

2. Chiqindi gazlar va qurumning konsentratsiyasini aniqash.

I**shning bajarish joyi.** Toshkent shaqar IIBB YQXBga qarashli Diagnostika markazi

Ishlatiladigan asbob uskunalar: Gazni taqlil qiluvchi va tutunini o‘lchovchi asbob.

Transport vositalarining atrof-muhitga undan foydalanish davrida chiqadigan har xil zaharli chiqindilar: is gazi (SO), uglevodlar (SNx), azot oksidlari (NOx), qattiq zarrachalar, oltingugurt oksidlari (SOx) miqdorini aniqlanadi.

Yuqoridagi chiqindi gazlardan eng zaharlisi karbyuratorli dvigatel uchun is gazi (SO) va dizelli dvigatellar uchun esa «qurum» miqdori qisoblanadi. Ularning miqdorini quyidagicha aniqlanadi.

SO ning miqdorini aniqlashda asosan infraqizil spektroskopiya (IKS) usulidan foydalaniladi. Bu usul 4,7 mkm uzunlikdagi infraqizil nurlanishlarni selektiv yutishga asoslanga bo‘lib o‘lchash asbobining nomi «Gazni taqlil qiluvchi» deb ataladi.

Dizel dvigatellardagi tutuning konsentratsiyasining aniqlashda chiqindi gazlarni filtrdan o‘tkazib, so‘ng uning qoralik darajasini optik usulda o‘lchash, yoki chiqindi gazlarning optik tavsiflarini aniqlash usullaridan foydalanadi.

Hisobot tarkibi

1. Chiqindi gazlarning aniqlangan qiymatlari
2. Chiqindi gazlarni o‘lchashda foydalanilgan asboblar sxemasi.
3. Xulosa.

Variantlar va ilovalar

1-laboratoriya ishi uchun topshiriqlar

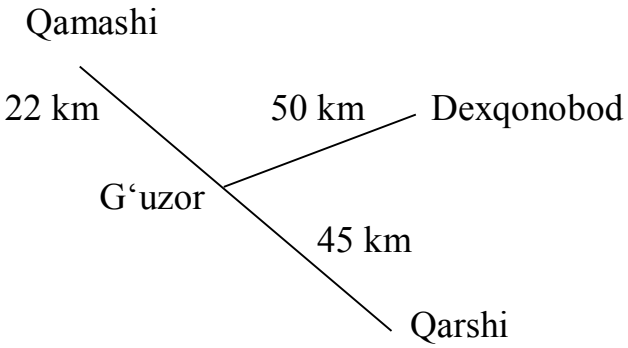
1-ilova

Variantlar	Transport vositasi turi	Yuk ko‘tarish qobiliyati q_n, t	Avtomobil-ning massasi G_o, t	Kuzovning uzunligi a_k, m	Kuzovning eni b_k, m	Kuzov bor-tining balandligi h, m
1	2	3	4	5	6	7
Bortli avtomobillar						
1	Otoyol -65.9	3,5	3,5	3,1	2,1	0,6
2	Otoyol-80.12	5,0	3,2	3,7	2,2	0,7
3	MAN CLA 16220	16,0	5,8	7,1	2,5	1,2
4	MAN CLA 26.280	26,0	7,8	6,1	2,5	1,3
5	KamAZ-5320	8,0	7,1	5,2	2,3	0,5
6	KamAZ-53212	10,0	8,2	6,1	2,3	0,5
7	MAZ-53363	7,7	8,8	6,1	2,5	0,72
8	MAZ-5335	8,0	6,7	4,9	2,4	0,7
9	MAZ-53366	9,5	7,0	5,5	2,3	0,6
10	MAZ-53352	8,4	7,4	6,3	2,4	0,7
11	MAN CLA 22.240	22,0	6,5	6,4	2,3	1,25
	Samosval avtomobillar					
1	2	3	4	5	6	7
12	MAN TGA 24.320	24,0	7,5	6,5	2,5	1
13	MAZ-55513	7,0	9,0	3,8	2,4	0,63
14	MAZ-5552	9,0	9,2	4,4	2,4	0,5
15	KamAZ-5511	10,0	9,0	4,5	2,3	0,8
16	MAZ-5549	8,0	7,2	3,3	2,3	0,7
17	MAZ-551650	19,0	14,0	4,44	2,4	1,085
18	MAZ-5516	20,0	13,0	4,44	2,4	1,085
	Bortli tirkamalar					
19	GKB-817	5,5	2,5	4,7	2,3	0,6
20	GKB-8350	8,0	3,5	6,1	2,3	0,5
21	MAZ-8926	8,0	3,8	5,5	2,4	0,7
	Bortli yarim tirkamalar					
22	OdAZ-885	7,5	2,8	6,1	2,2	0,6
23	OdAZ-9370	14,2	4,9	9,2	2,3	0,6
24	MAZ-5205A	20,0	5,7	10,0	2,3	0,7
25	MAZ-9398	26,2	6,5	12,2	2,4	0,7

2-laboratoriya ishi uchun topshiriqlar

1-variant

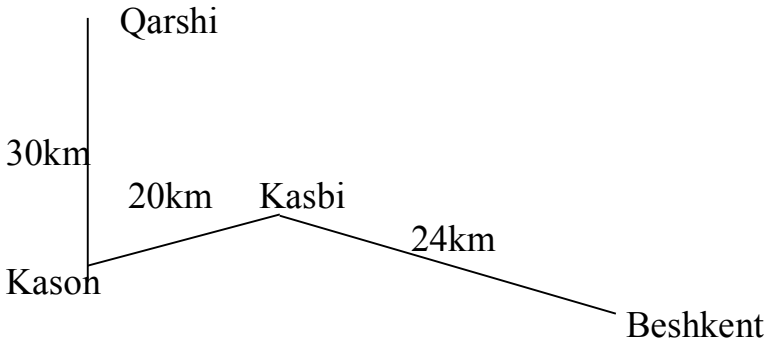
T_{ish} = 8,8 soat
D_{yik} = 305 kun
α_{ich} = 0,67



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	G‘uzor	Gazlama	260	1
2	G‘uzor	Qarshi	Sovun	200	1
3	Dexqonobod	G‘uzor	Konteyner	250	1
4	Qarshi	G‘uzor	Paxta chigiti	300	1
5	Qamashi	Dexqonobod	Sabzavotlar	200	2
6	Qarshi	Qamashi	Yog‘och taxta	150	1

2-variant

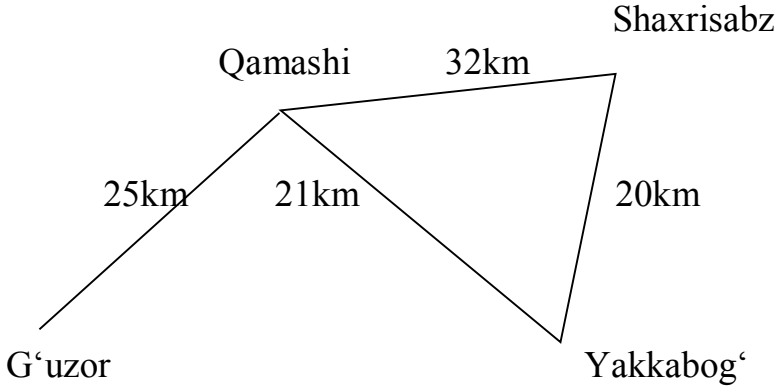
Qarshi
T_{ish} = 8,8 soat
D_{yik} = 253 kun
α_{ich} = 0,68



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Kason	Kasbi	Yog‘och taxta	300	1
2	Beshkent	Kasbi	Kiyim-kechak	180	3
3	Kasbi	Qarshi	Rezina maxsulotlari	150	1
4	Qarshi	Beshkent	G‘isht	100	1
5	Beshkent	Kason	Oyoq-kiyim	200	2
6	Kason	Beshkent	Konteyner	280	1

3-variant

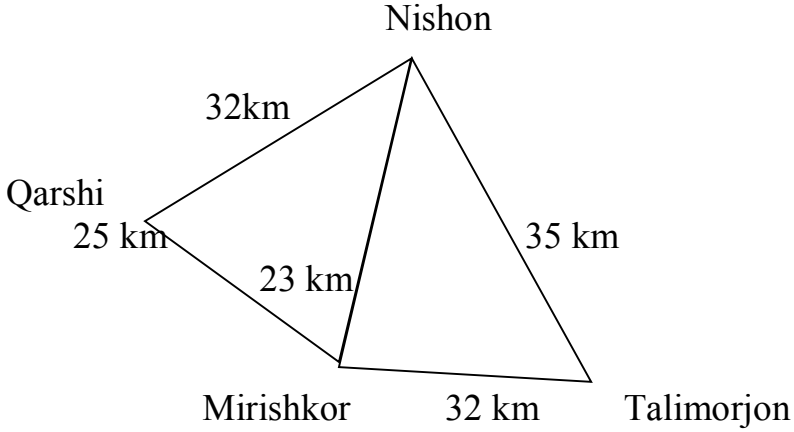
T_{ish} = 9,2 soat
D_{yik} = 253 kun
α_{ich} = 0,7



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	G‘uzor	CHo‘yan quvur	150	1
2	Shaxrisabz	Yakkabog‘	Kir yuvish poroshogi	200	2
3	G‘uzor	Shaxrisabz	Oyna (yashikda)	250	1
4	Yangibozor	Qamashi	Apparatlar	200	1
5	Qamashi	Shaxrisabz	Gaz plitalari	100	4
6	G‘uzor	Yakkabog‘	Sabzavotlar	160	2

4-variant

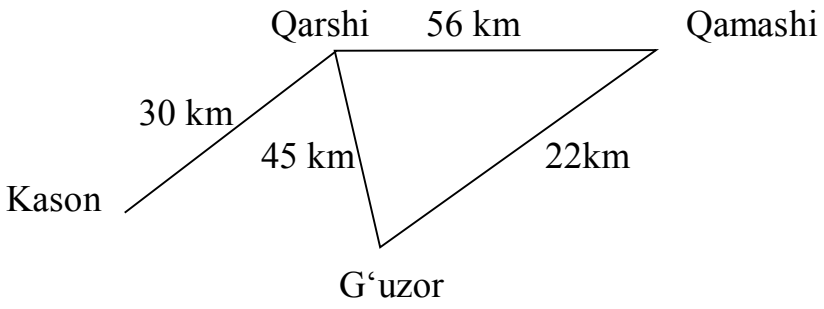
T_{ish} = 9,2 soat
D_{yik} = 305 kun
α_{ich} = 0,7



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	Nishon	Gazlama	270	1
2	Mirishkor	Qarshi	Metall	180	1
3	Nishon	Talimorjon	Ho‘l meva	200	1
4	Talimorjon	Mirishkor	Sabzavotlar	200	2
5	Mirishkor	Nishon	Kir yuvish mashinalari	150	3
6	Qarshi	Talimorjon	Konserva	150	1

5-variant

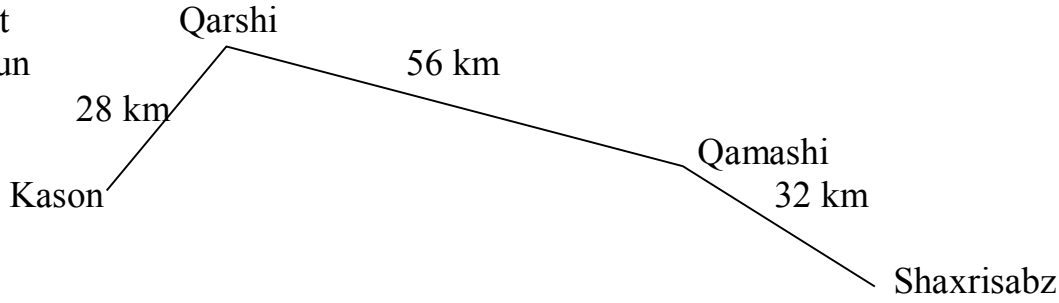
T_{ish} = 9,2 soat
D_{yik} = 305 kun
α_{ich} = 0,68



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	220	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	1
3	Kason	Qarshi	Toylangan paxta tolasi	140	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	2
5	Qamashi	Qarshi	Konteyner	250	1
6	Kason	G‘uzor	Un (qoplangan)	240	1

6-variant

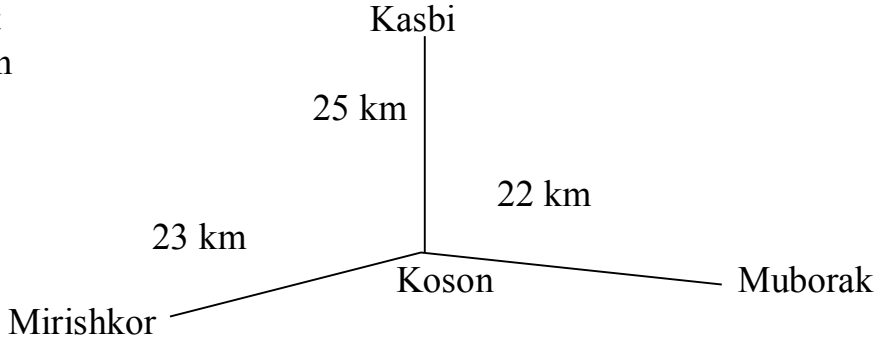
T_{ish} = 8,8 soat
D_{yik} = 305 kun
α_{ich} = 0,72



T/ R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1.	Shaxrisabz	Kason	Mineral o‘g‘itlar	120	1
2.	Kason	Qarshi	Bo‘yoqlarbz	90	3
3.	Qarshi	Qamashi	Metall	300	1
4.	Qamashi	Shaxrisabz	Elektr dvigatellar	200	2
5.	Shaxrisabz	Qamashi	CHo‘yan quvur	240	1
6.	Qarshi	Kason	Faneralar	280	1

7-variant

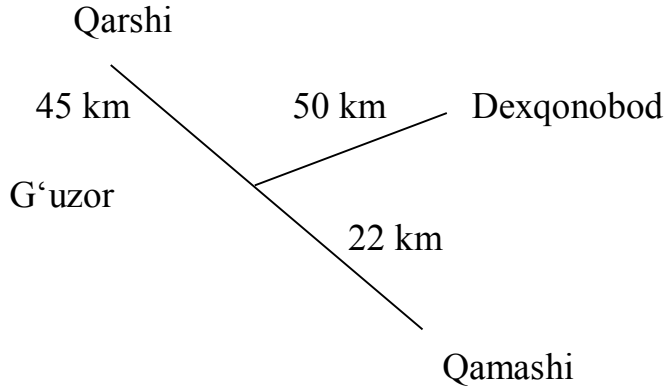
T_{ish} = 8,5 soat
D_{yik} = 305 kun
α_{ich} = 0,64



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Koson	Kasbi	Gazlama	300	1
2	Muborak	Mirishkor	Yog‘och taxta	250	1
3	Mirishkor	Muborak	Karton mahsulotlari	150	3
4	Koson	Mirishkor	Kartoshka	100	1
5	Kasbi	Koson	Toylangan paxta tolasi	200	1
6	Muborak	Kasbi	Qishloq xo‘jalik mashinalari	160	2

8-variant

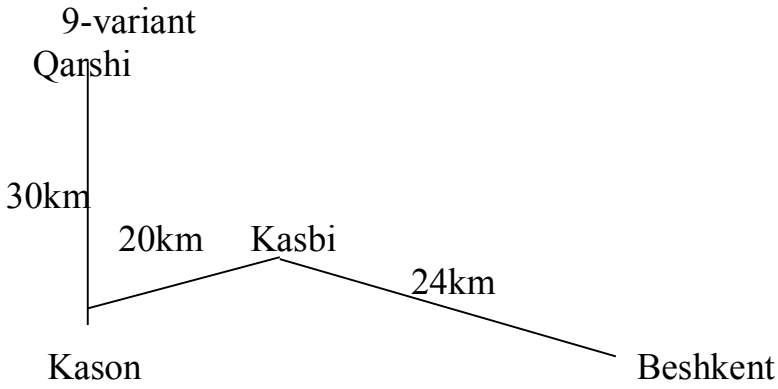
T_{ish} = 8,9 soat
D_{yik} = 253 kun
α_{ich} = 0,75



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	G‘uzor	Rangli metall	100	1
2	G‘uzor	Qamashi	Paxta chigiti	140	2
3	Dexqonobod	G‘uzor	Konteyner	200	1
4	Qamashi	G‘uzor	Konserva	180	1
5	Qarshi	Dexqonobod	Gazlama	260	1
6	Qamashi	Qarshi	Sabzavotlar	200	2

9-variant

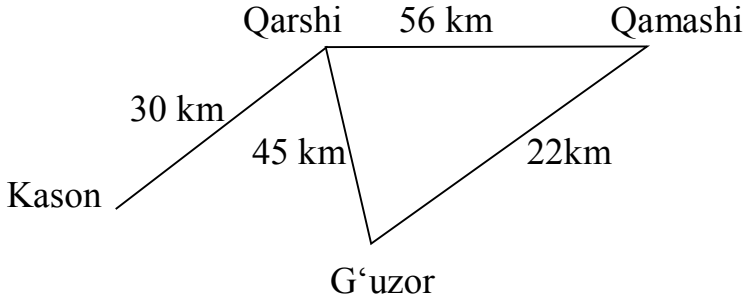
T_{ish} = 8,5 soat
D_{yik} = 253 kun
α_{ich} = 0,72



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Kason	Kasbi	Yog‘och taxta	200	1
2	Beshkent	Kasbi	Kiyim-kechak	150	3
3	Kasbi	Qarshi	Alyumin maxsulotlari (yashikda)	240	2
4	Qarshi	Beshkent	Qand-shakar (qopda)	150	1
5	Beshkent	Kason	Oyoq-kiyim	160	2
6	Kason	Beshkent	Konteyner	220	1

10-variant

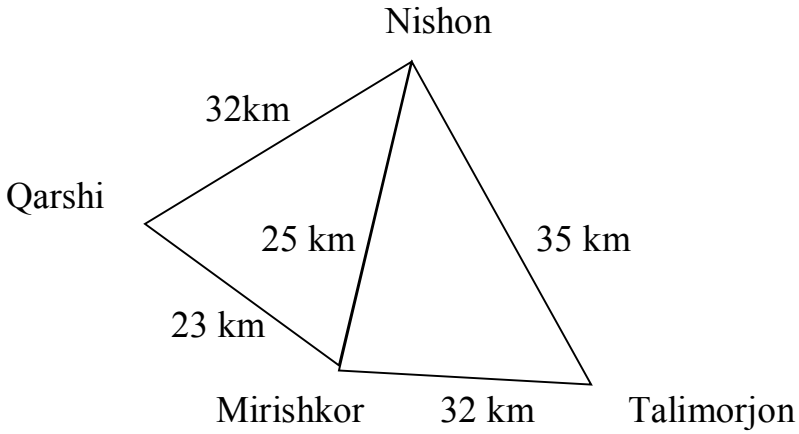
T_{ish} = 10 soat
D_{yik} = 253 kun
α_{ich} = 0,7



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	200	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	1
3	Kason	Qarshi	Toylangan paxta tolasi	150	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	2
5	Qamashi	Qarshi	Konteyner	250	1
6	Kason	G‘uzor	Un (qoplangan)	300	1

11-variant

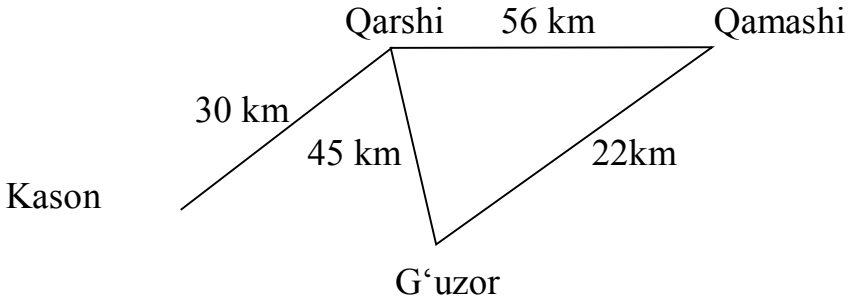
T_{ish} = 10.5 soat
D_{yik} = 253 kun
α_{ich} = 0,75



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming, t	Yuklar sinfi
1	Qarshi	Nishon	Gazlama	250	1
2	Mirishkor	Qarshi	Metall	100	1
3	Nishon	Talimorjon	Ho‘l meva	200	1
4	Talimorjon	Mirishkor	Sabzavotlar	200	2
5	Mirishkor	Nishon	Kir yuvish mashinalari	150	3
6	Qarshi	Talimorjon	Konserva	150	1

12-variant

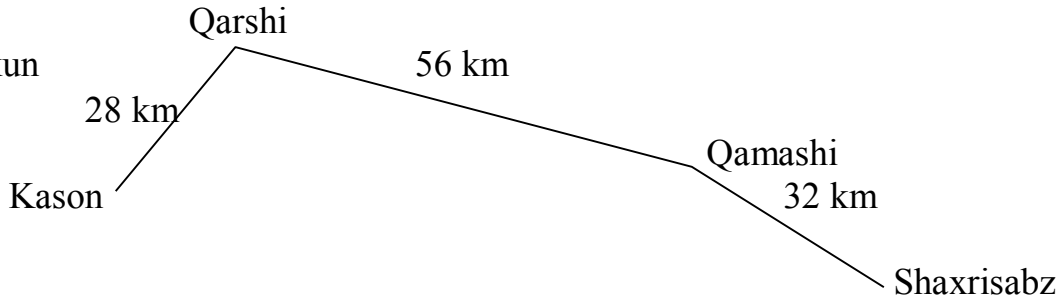
T_{ish} = 9 soat
D_{yik} = 253 kun
α_{ich} = 0,72



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	250	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	1
3	Kason	Qarshi	Toylangan paxta tolasi	150	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	2
5	Qamashi	Qarshi	Konteyner	300	1
6	Kason	G‘uzor	Un (qoplangan)	160	2

13-variant

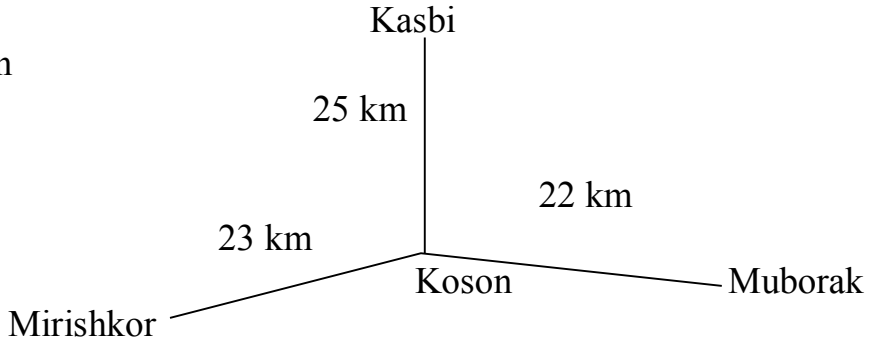
T_{ish} = 9 soat
D_{yik} = 253 kun
α_{ich} = 0,75



T/R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1.	Shaxrisabz	Kason	Mineral o‘g‘itlar	150	1
2.	Kason	Qarshi	Bo‘yoqlarbz	100	2
3.	Qarshi	Qamashi	Metall	300	1
4.	Qamashi	Shaxrisabz	Elektr dvigatellar	200	2
5.	Shaxrisabz	Qamashi	CHo‘yan quvur	250	1
6.	Qarshi	Kason	Faneralar	280	1

14-variant

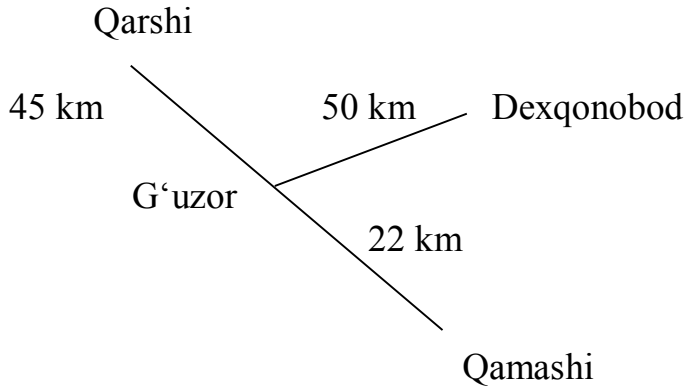
T_{ish} = 8 soat
D_{yik} = 253 kun
α_{ich} = 0,64



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Koson	Kasbi	Gazlama	100	1
2	Muborak	Mirishkor	Yog‘och taxta	250	1
3	Mirishkor	Muborak	Karton mahsulotlari	150	3
4	Koson	Mirishkor	Kartoshka	300	1
5	Kasbi	Koson	Toylangan paxta tolasi	200	1
6	Muborak	Kasbi	Qishloq xo‘jalik mashinalari	160	2

15-variant

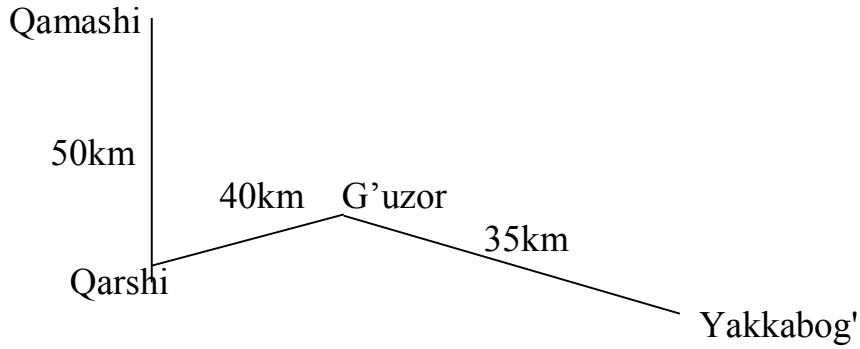
T_{ish} = 10 soat
D_{yik} = 305 kun
α_{ich} = 0,7



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	G‘uzor	Rangli metall	150	1
2	G‘uzor	Qamashi	Paxta chigiti	140	2
3	Dexqonobod	G‘uzor	Konteyner	200	1
4	Qamashi	G‘uzor	Konserva	180	1
5	Qarshi	Dexqonobod	Gazlama	250	1
6	Qamashi	Qarshi	Sabzavotlar	200	2

16-variant

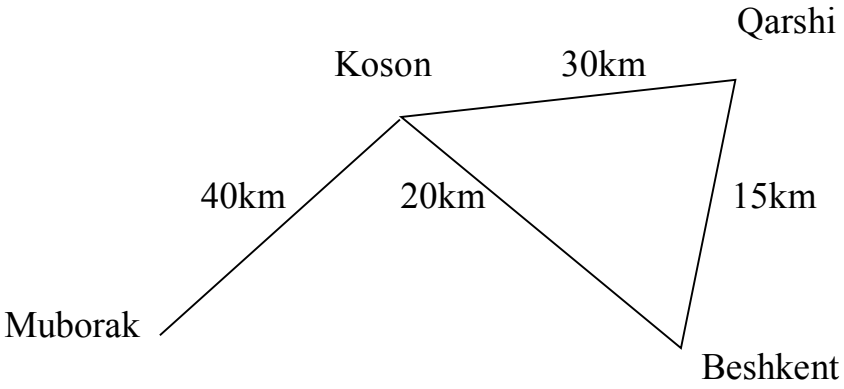
T_{ish} = 8,0 soat
D_{yik} = 305 kun
α_{ich} = 0,7



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	G’uzor	Yog‘och taxta	150	1
2	Yakkabog'	G’uzor	Kiyim-kechak	90	3
3	G’uzor	Qamashi	Rezina maxsulotlari	120	3
4	Qamashi	Yakkabog'	G‘isht	100	1
5	Yakkabog'	Qarshi	Oyoq-kiyim	80	2
6	Qarshi	Yakkabog'	Konteyner	110	1

17-variant

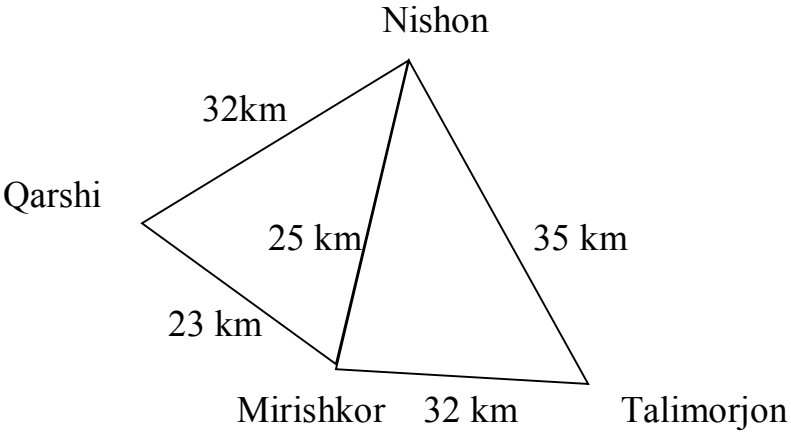
T_{ish} = 9,5 soat
D_{yik} = 253 kun
α_{ich} = 0,65



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Koson	Muborak	CHo‘yan quvur	100	1
2	Qarshi	Beshkent	Kir yuvish poroshogi	120	2
3	Muborak	Qarshi	Oyna (yashikda)	150	1
4	Beshkent	Koson	Apparatlar	80	2
5	Koson	Qarshi	Gaz plitalari	100	4
6	Muborak	Beshkent	Sabzavotlar	80	2

18-variant

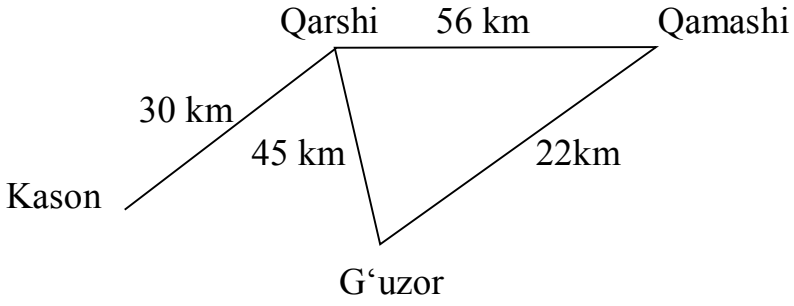
T_{ish} = 10 soat
D_{yik} = 256 kun
α_{ich} = 0,6



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	Nishon	Gazlama	100	1
2	Mirishkor	Qarshi	Metall	300	1
3	Nishon	Talimorjon	Ho‘l meva	200	1
4	Talimorjon	Mirishkor	Sabzavotlar	200	2
5	Mirishkor	Nishon	Kir yuvish mashinalari	150	3
6	Qarshi	Talimorjon	Konserva	150	1

19-variant

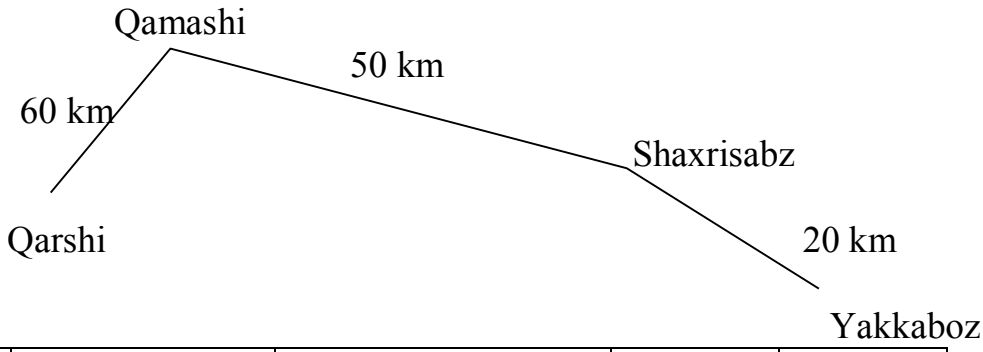
T_{ish} = 11 soat
D_{yik} = 253 kun
α_{ich} = 0,75



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	250	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	4
3	Kason	Qarshi	Toylangan paxta tolasi	150	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	2
5	Qamashi	Qarshi	Konteyner	300	1
6	Kason	G‘uzor	Un (qoplangan)	160	2

20-variant

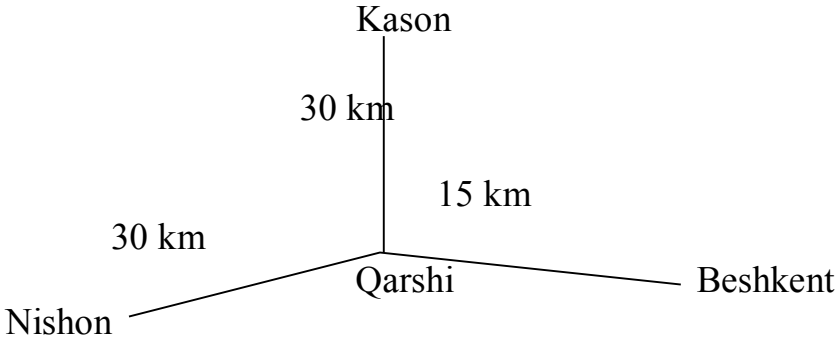
T_{ish} = 8,6 soat
D_{yik} = 253 kun
α_{ich} = 0,51



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Yakkaboz	Qarshi	Mineral o‘g‘itlar	120	1
2	Qarshi	Qamashi	Bo‘yoqlar	90	3
3	Qamashi	Shaxrisabz	Metall	150	1
4	Shaxrisabz	Yakkaboz	Elektr dvigatellar	160	2
5	Yakkaboz	Shaxrisabz	CHo‘yan quvr	140	1
6	Qamashi	Qarshi	Faneralar	180	1

21-variant

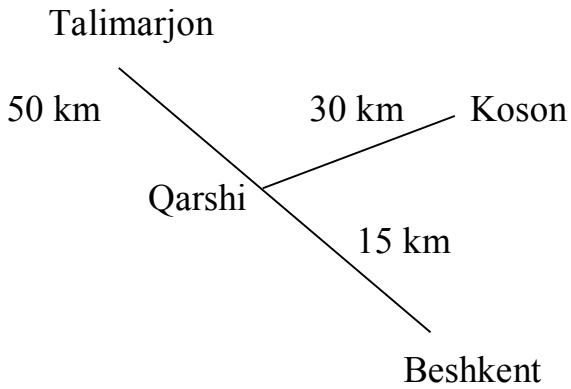
T_{ish} = 9 soat
D_{yik} = 253 kun
α_{ich} = 0,65



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	Kason	Gazlama	100	1
2	Beshkent	Nishon	Yog‘och taxta	150	1
3	Nishon	Beshkent	Karton mahsulotlari	120	3
4	Qarshi	Nishon	Kartoshka	110	1
5	Kason	Qarshi	Toylangan paxta tolasi	140	1
6	Beshkent	Kason	Qishloq xo‘jalik mashinalari	160	2

22-variant

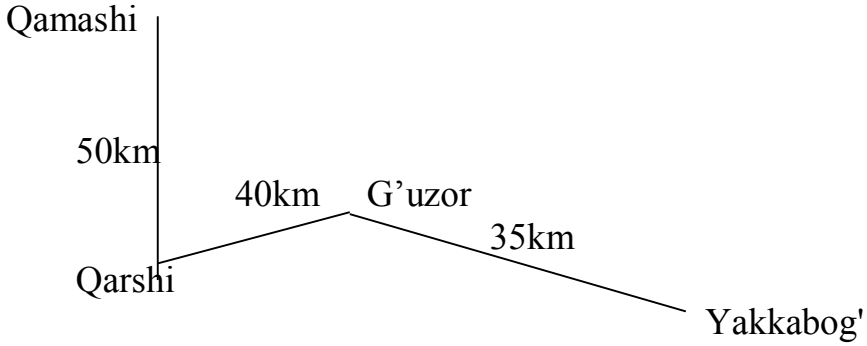
T_{ish} = 9, soat
D_{yik} = 305 kun
α_{ich} = 0,58



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Talimarjon	Qarshi	Gazlama	140	1
2	Qarshi	Beshkent	Sovun	110	1
3	Koson	Beshkent	Konteyner	80	1
4	Beshkent	Qarshi	Paxta chigiti	100	2
5	Talimarjon	Koson	Sabzavotlar	160	2
6	Beshkent	Talimarjon	Yog‘och taxta	90	1

23-variant

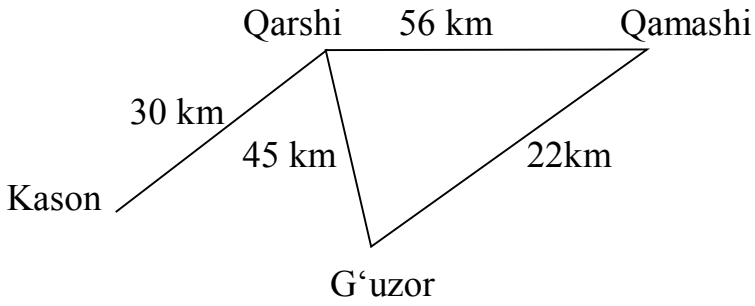
T_{ish} = 8,7 soat
D_{yik} = 253 kun
α_{ich} = 0,63



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	G’uzor	Yog‘och taxta	200	1
2	Yakkabog'	G’uzor	Kiyim-kechak	100	3
3	G’uzor	Qamashi	Rezina maxsulotlari	120	1
4	Qamashi	Yakkabog'	G‘isht	100	1
5	Yakkabog'	Qarshi	Oyoq-kiyim	80	2
6	Qarshi	Yakkabog'	Konteyner	110	1

24-variant

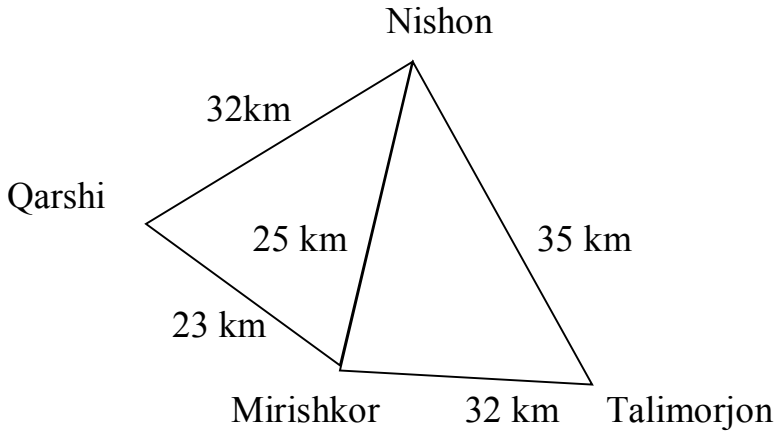
T_{ish} = 8.5 soat
D_{yik} = 305 kun
α_{ich} = 0,65



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	250	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	4
3	Kason	Qarshi	Toylangan paxta tolasi	150	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	
5	Qamashi	Qarshi	Konteyner	300	1
6	Kason	G‘uzor	Un (qoplangan)	160	2

25-variant

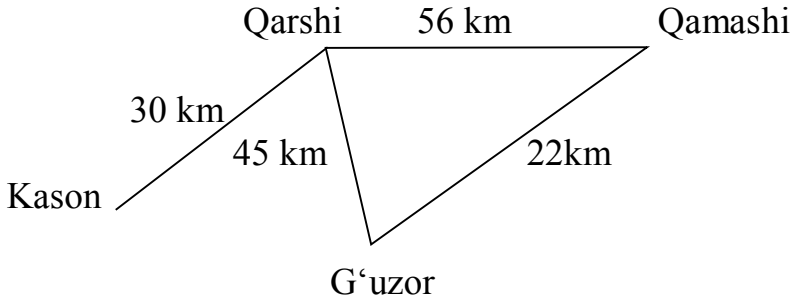
T_{ish} = 8 soat
D_{yik} = 305 kun
α_{ich} = 0,8



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	Nishon	Gazlama	270	1
2	Mirishkor	Qarshi	Metall	180	1
3	Nishon	Talimorjon	Ho‘l meva	200	1
4	Talimorjon	Mirishkor	Sabzavotlar	200	2
5	Mirishkor	Nishon	Kir yuvish mashinalari	150	3
6	Qarshi	Talimorjon	Konserva	150	1

26-variant

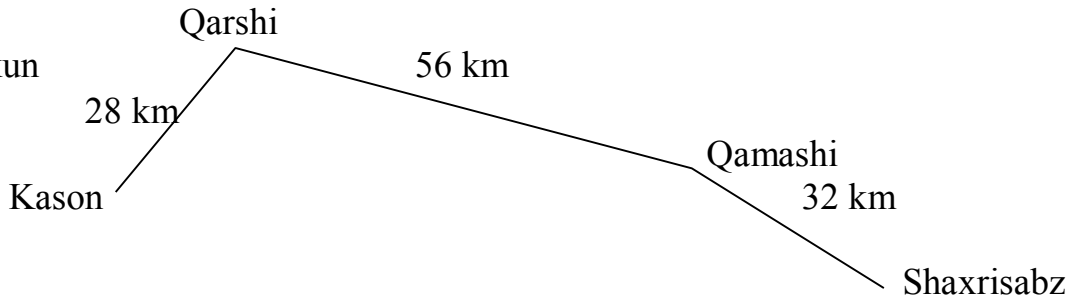
T_{ish} = 9 soat
D_{yik} = 253 kun
α_{ich} = 0,72



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qamashi	Kason	Kartoshka	250	1
2	Qarshi	G‘uzor	Yog‘och taxta	100	1
3	Kason	Qarshi	Toylangan paxta tolasi	150	1
4	G‘uzor	Qamashi	Trikotaj mahsulotlari	200	2
5	Qamashi	Qarshi	Konteyner	300	1
6	Kason	G‘uzor	Un (qoplangan)	160	2

27-variant

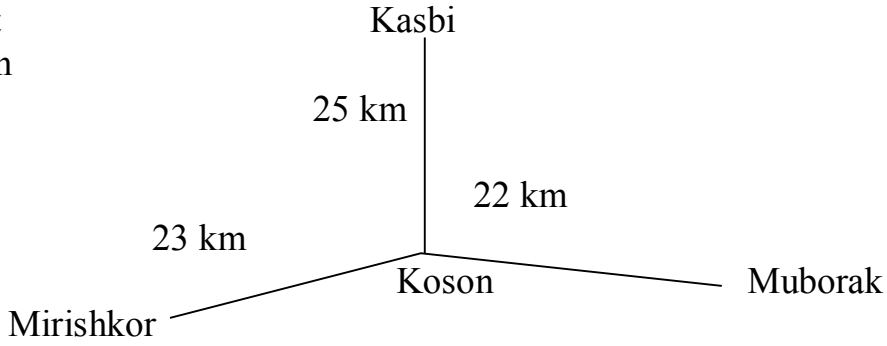
T_{ish} = 8 soat
D_{yik} = 305 kun
α_{ich} = 0,7



T/R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1.	Shaxrisabz	Kason	Mineral o‘g‘itlar	350	1
2.	Kason	Qarshi	Bo‘yoqlarbz	100	2
3.	Qarshi	Qamashi	Metall	300	1
4.	Qamashi	Shaxrisabz	Elektr dvigatellar	200	2
5.	Shaxrisabz	Qamashi	CHo‘yan quvur	250	1
6.	Qarshi	Kason	Faneralar	100	1

28-variant

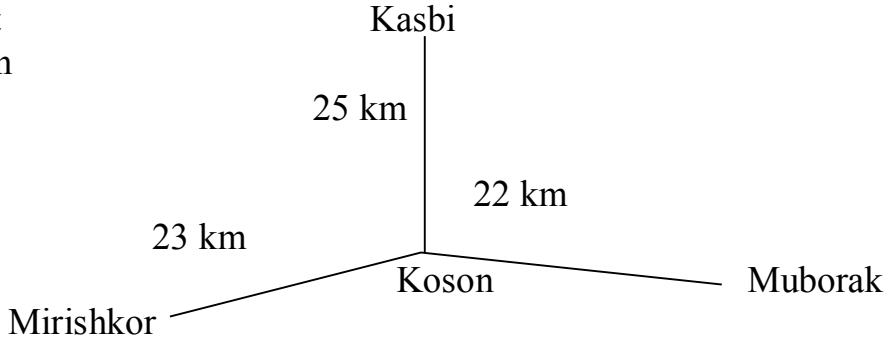
T_{ish} = 8,5 soat
D_{yik} = 253 kun
α_{ich} = 0,75



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Koson	Kasbi	Gazlama	150	1
2	Muborak	Mirishkor	Yog‘och taxta	250	1
3	Mirishkor	Muborak	Karton mahsulotlari	100	3
4	Koson	Mirishkor	Kartoshka	300	1
5	Kasbi	Koson	Toylangan paxta tolasi	200	2
6	Muborak	Kasbi	Qishloq xo‘jalik mashinalari	160	1

29-variant

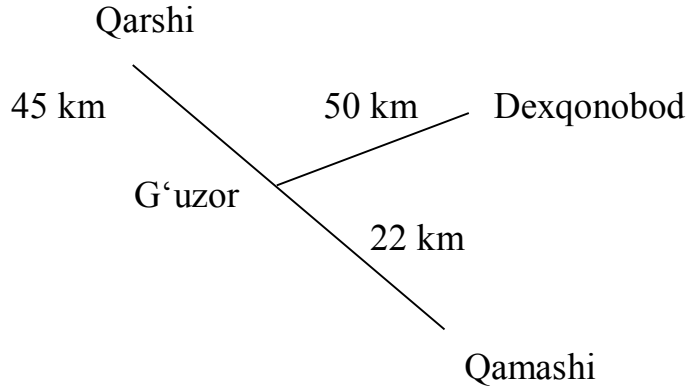
T_{ish} = 8,5 soat
D_{yik} = 305 kun
α_{ich} = 0,6



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Koson	Kasbi	Gazlama	100	3
2	Muborak	Mirishkor	Yog‘och taxta	250	1
3	Mirishkor	Muborak	Karton mahsulotlari	150	3
4	Koson	Mirishkor	Kartoshka	100	1
5	Kasbi	Koson	Toylangan paxta tolasi	200	1
6	Muborak	Kasbi	Qishloq xo‘jalik mashinalari	160	2

30-variant

T_{ish} = 9 soat
D_{yik} = 305 kun
α_{ich} = 0,75



T / R	Jo‘natuvchi	Qabul qiluvchi	Yukning nomi	Hajmi, ming,t	Yuklar sinfi
1	Qarshi	G‘uzor	Rangli metall	100	1
2	G‘uzor	Qamashi	Paxta chigiti	160	2
3	Dexqonobod	G‘uzor	Konteyner	200	1
4	Qamashi	G‘uzor	Konserva	180	1
5	Qarshi	Dexqonobod	Gazlama	260	1
6	Qamashi	Qarshi	Sabzavotlar	200	2

3-laboratoriya ishi uchun variantlar 2-ilova

Variantlar	Transport vositasi turi	Ish vaqti (T_{ish}) soat	O‘rtacha texnik tezlik (V_T) km/soat	Masofadan foydalanish koeffisiyenti (β)	Yuk ko‘taruvchanlik dan foydalanish koeffitsiyenti (γ_{st})	Ortish-tushirish vaqti (t_{O-T}) soat	(q_N) t
1	2	3	4	5	6	7	8
1	MAN CLA 16.220	12	40	0,8	0,7	0,8	16,0
2	MAZ-5335	11,5	26	0,5	0,9	0,66	8,0
3	MAZ-53352	12,8	20	0,7	1,0	0,66	8,4
4	MAN CLA 26.280	10,5	40	0,9	0,8	1,0	26,0
5	MAN TGA 33.360	10,8	35	0,7	0,9	0,2	33,0
6	MAN TGA 19.400	12,0	45	1.0	1,0	1,0	19,0
7	MAN TGA 26.400	11,5	45	1.0	0,9	1,0	26,0
8	MAZ-5549	12,2	26	0,7	0,9	0,23	8,0
9	KamAZ-5511	10,7	30	0,9	0,8	0,23	10,0
10	MAZ-504+ MAZ-9826	11,5	24	0,5	0,7	0,85	16,0
11	MAN CLA 16.220	11,8	40	0,8	0,8	1,0	16,0
12	MAN CLA 26.280	9,8	40	1,0	0,9	1,0	26,0
13	MAN TGA 33.360	12,2	35	0,6	0,8	0,2	33,0
14	KamAZ-5320	10,8	28	0,7	0,9	0,6	8,0
15	MAN TGA 19.400	10,0	45	0,5	1,0	1,0	19,0
16	MAN TGA 26.400	12,7	45	0,8	0,9	1,0	26,0
17	MAZ-5549	10,5	28	0,5	0,9	0,23	8,0
18	KamAZ-5511	11,5	30	0,6	1,0	0,23	10,0
19	MAZ-5334	9,5	24	0,7	1,0	0,67	9,2
20	KamAZ-53212	9,0	25	0,75	0,7	0,6	10,0
21	MAZ-5335	10,0	24	0,6	0,6	0,5	8,0
22	KamAZ-55111	9,2	24	0,7	1,0	0,23	13,0
23	MAN TGA 26.400	8,8	45	0,7	1,0	1,0	26,0
24	KamAZ-5320+ GKB-8350	9,4	24	0,6	0,8	0,8	16,0
25	Otoyol -65.9	9,2	30	0,6	0,8	0,3	3,5
26	Otoyol -80,20	9,0	30	0,7	0,9	0,5	5,0

27	MAN CLA 26.280	8,6	40	0,5	1,0	1,0	26,0
28	MAN TGA 33.360	8,0	35	0,8	1,0	0,2	33,0
29	MAZ-5335	9,8	30	0,5	1,0	0,5	8,0
30	Otoyol -80,20	8,7	30	0,6	0,8	0,5	5,0

8- laboratoriya ishini bajarish uchun variantlar 3-ilova

Vari-antlar	Punktlararo masofalar, km					
	To‘g‘ridan-to‘g‘ri tashishlar	Uchastkalar bo‘yicha tashishlar				
	A – YE	A – B	B – V	V – G	G – D	D – YE
1	840	170	160	185	160	165
2	780	150	155	165	170	140
3	630	125	145	155	130	75
4	655	160	95	170	140	90
5	720	120	165	165	155	115
6	630	110	150	130	140	100
7	770	180	130	175	135	150
8	740	160	130	120	150	130
9	620	110	175	145	110	80
10	700	165	115	165	170	85
11	610	170	100	160	105	75
12	615	90	150	155	120	100
13	660	180	130	150	140	60
14	670	170	120	160	130	90
15	590	90	190	110	150	50
16	665	130	65	170	120	180
17	770	165	135	180	170	120
18	710	150	170	100	180	110
19	725	160	175	160	1450	85
20	720	120	150	140	165	145
21	680	140	130	150	100	160
22	650	110	120	130	150	140
23	700	150	90	160	180	120
24	670	130	130	140	90	80
25	680	100	130	180	140	130
26	730	90	155	165	130	190
27	750	110	150	180	120	190
28	640	95	115	125	185	120
29	760	135	150	140	165	170
30	790	150	180	160	140	160

9-10 – laboratoriya ishi uchun variantlar 4-ilova

Variantlar	To‘g‘ri yo‘nalish passajirlari	Teskari yo‘nalish passajirlari	L_m, km	n_{ost}
1	5300	5000	15	23
2	6100	6000	16	25
3	5800	5600	11	15
4	6200	6100	13	21
5	6300	6250	12	19
6	6500	6300	14	22
7	6400	6300	13	20
8	6600	6500	16	25
9	7000	6900	17	26
10	7100	7000	19	30
11	5500	5400	20	34
12	6200	6000	21	35
13	7250	7200	20	34
14	7200	7100	23	37
15	5200	5000	22	33
16	5250	5150	24	37
17	6200	6100	15	40
18	5400	5300	16	42
19	6400	6300	18	42
20	6200	6000	14	22
21	6500	6350	13	20
22	7000	6800	16	25
23	7800	7700	18	28
24	6700	6550	19	30
25	8500	8350	20	32
26	9000	8800	21	36
27	8400	8300	23	38
28	8600	8500	24	40
29	6900	6700	15	42
30	7200	7100	13	20

V_t = 35 km/soat; q_n = 95 pass.; t_{mit} = 0,5 min; t_{mnt} = 5 min.

Ortish-tushirish ishlarini bajarish vaqti meyori (t_{o-t}), min.

(o‘quv maqsadlari uchun)

5-ilova

Avtomobil (avtopoyezd) ning yuk ko‘tarish qobiliyati	Mexanizatsiyalashtirilgan usuldagi asosiy meyorlar uchun (t_{o-t}), min		Mexanizag‘iya lashtirilmagan usulda oldingiga qo‘shimcha vaqt, min
	Uyulib tashiluvchi yuklar uchun	Boshqa yuklar uchun	
Ortish joylarida			
1,5t gacha	4	9	10
1,5t – 2,5t	5	10	10
2,5t – 4t	6	12	12
4t – 7t	7	15	14
7t – 10t	8	20	17
10t – 15t	10	25	20
15t dan ortiq	15	30	22
Tushirish joylarida (samosvallardan tashqari)			
1,5t gacha	4	9	4
1,5t – 2,5t	5	10	5
2,5t – 4t	6	12	6
4t – 7t	7	15	7
7t – 10t	8	20	8
10t – 15t	10	25	9
15t dan ortiq	15	30	10
Tushirish joylarida (samosvallar uchun)			
6t	4	6	-
6t – 10t	6	8	-
10t dan ortiq	8	10	-

Transport vositalarining 1 km masofani bosib o‘tish uchun va 1 soat ishlashi uchun sarflanadigan xarajat (so‘m hisobida)

6 – ilova

Avtomobillar turi (markasi)	Yuk ko‘tarish qobiliyati, t	Xarajatlar, so‘m	
		O‘zgaruvchan, $S_{o‘z}$, so‘m/km	Doimiy, S_{doim} sum/soat
Bortli yuk avtomobillari uchun			
Otoyol-85.12	5,5	130	500
MAN CLA26.280	25	180	550
KAMAZ-5320	8	250	750
MAZ-53363	8,2	200	600
MAN CLA 16.220	16	150	450
MAZ-5334	7	140	500
MAZ-533608	7,6	160	580
MAN CLA 19.240	22	122	490
Samosvallar uchun			
MAZ-55513	7	150	550
MAZ-5552	9	180	600
MAN TGA 33.360	33	200	500
MAZ-551650	19	420	750
MAZ-5516	20	700	1000
KAMAZ-5511	10	250	600
MAN TGA 22.220	22	120	420
MAN TGA 19.360	19	110	400
Tirkamali avtopoyezdlar uchun			
MANCLA16.220+MAH-452	28	200	550
KAMAZ-5320+GKB-8350	16	380	800
MAZ-64229+MAZ-93886	27,5	450	750
Yarim tirkamali avtopoyezdlar uchun			
MAN TGA 19.400	19	130	500
MAN TGA26.400	26	150	600
KAMAZ-5410+ODAZ-9370	14	340	820
MAZ-64229+MAZ-93802	14	320	800

Yuklash-tushirish joylarining ko‘lamini aniqlash

7 – ilova

Bariant	Avtomobil markasi	q_n, t	Q_k, t	T_r, soat	γ_s
1	MAN CLA 16.220	16,0	350	8,0	0,90
2	MAZ-5335	8,0	160	8,2	0,71
3	MAZ-53352	8,4	170	8,4	0,72
4	MAN CLA 26.280	26,0	400	8,6	0,93
5	MAN TGA 33.360	33,0	450	8,8	0,94
6	MAN TGA 19.400	19,0	380	8,9	0,95
7	MAN TGA 26.400	26,0	480	9,0	0,96
8	MAZ-5549	8,0	180	9,1	0,77
9	KamAZ-5511	10,0	200	9,2	0,78
10	MAZ-504+MAZ-9826	16,0	320	9,3	0,79
11	MAN CLA 16.220	16,0	400	9,4	0,88
12	MAN CLA 26.280	26,0	450	9,5	0,90
13	MAN TGA 33.360	33,0	500	9,6	0,92
14	KamAZ-5320	8,0	160,	9,7	0,60
15	MAN TGA 19.400	19,0	320	9,8	0,94
16	MAN TGA 26.400	26,0	400	9,9	0,95
17	MAZ-5549	8,0	150	10,0	0,70
18	KamAZ-5511	10,0	190	10,0	0,65
19	MAZ-5334	9,2	180	10,2	0,60
20	KamAZ-53212	10,0	170	10,3	0,70
21	MAZ-5335	8,0	150	10,4	0,066
22	KamAZ-55111	13,0	200	10,5	0,95
23	MAN TGA 26.400	26,0	420	10,6	1,00
24	KamAZ-5320+GKB-8350	16,0	300	10,7	0,70
25	Otoyol -65.9	3,5	100	11,0	1,00
26	Otoyol -80,20	5,0	120	8,0	0,90
27	MAN CLA 26.280	26,0	380	8,2	0,95
28	MAN TGA 33.360	33,0	430	8,5	0,94
29	MAZ-5335	8,0	160	10,0	0,66
30	Otoyol -80,20	5,0	130	9,0	0,90

FOYDALANILGAN ADABIYOTLAR

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MUNDARIJA **Bet**