

TOSHKENT AXBOROT TEXNOLOGIYALARI UNIVERSITETI

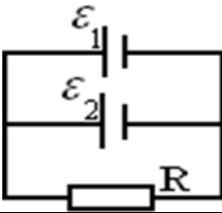
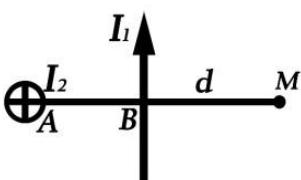
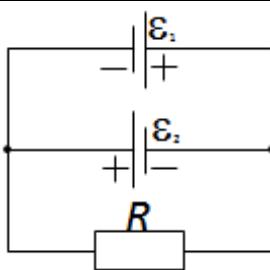
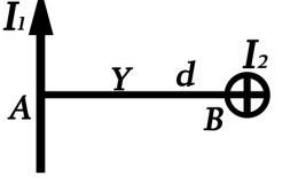
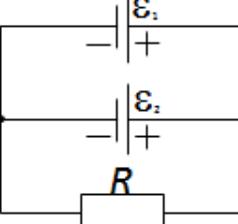
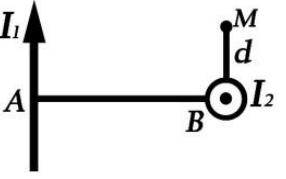
FIZIKA KAFEDRASI

**2-MODUL 1- SEMESTR
UCHUN FIZIKA FANIDAN MASALALAR**
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FIZIKADAN TESTLAR

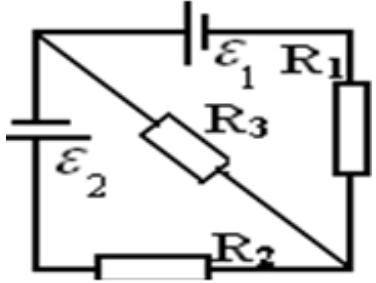
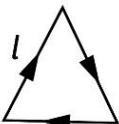
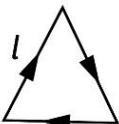
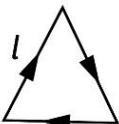
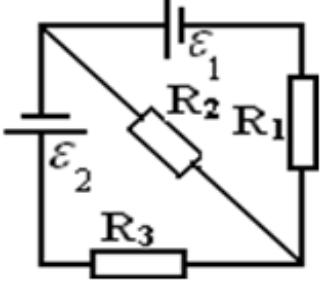
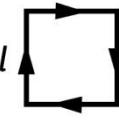
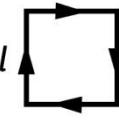
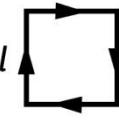
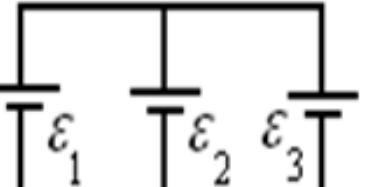
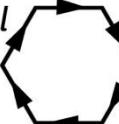
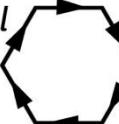
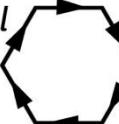
TOSHKENT 2015

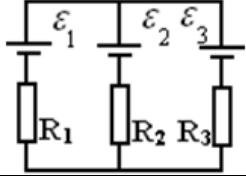
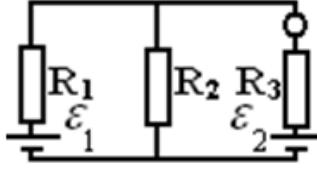
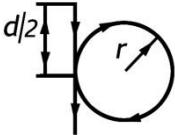
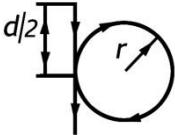
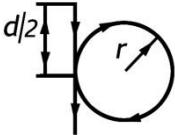
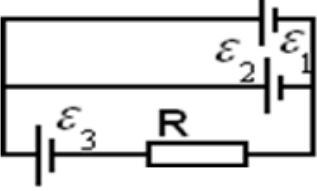
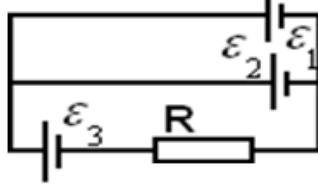
2-modul 1- semestr uchun fizika fanidan masalalar

1	Ikkita tok manbai: $\varepsilon_1=14$ V, ichki qarashiligi. $r_1=2$ Om va $\varepsilon_2=6$ V, ichki qarashiligi $r_2=4$ Om, hamda reostat $R=10$ Om rasmida ko'rsatilgandek ulangan. Reostatda va tok manbalarida tok kuchi aniqlansin.									
2	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmida ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.									
3	Ikkita akkumulyator batareyasi ($\varepsilon_1=10$ V, $r_1=1$ Om, $\varepsilon_2=8$ V, $r_2=2$ Om) va reostat ($R=6$ Om) rasmida ko'rsatilgandek qilib ulangan. Batareyalardagi va reostatdagi tok kuchi topilsin									
4	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmida ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan Y nuqtadagi magnit maydon induktsiyasini aniqlang.									
5	Ikkita tok manbai ($\varepsilon_1=8$ V, $r_1=2$ Om, $\varepsilon_2=6$ V, $r_2=1,5$ Om) va reostat ($R=10$ Om) rasmida ko'rsatilgandek qilib ulangan. Reostat orqali oquvchi tok kuchi I hisoblansin.									
6	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmida ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.									
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AB, sm	d, sm	I₁, A	I₂, A							
7	2	3	4							

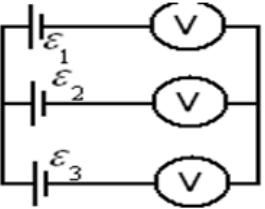
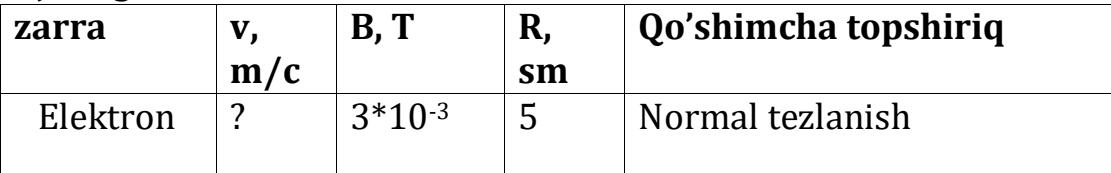
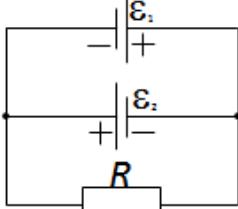
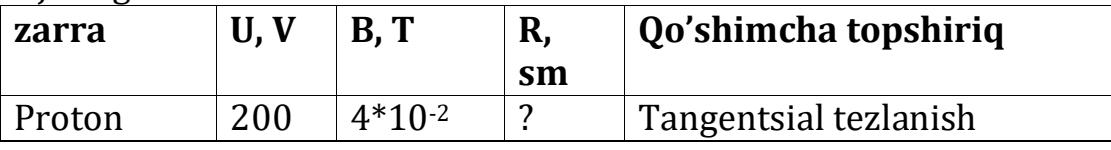
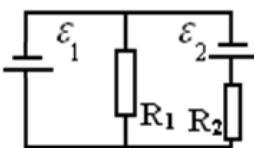
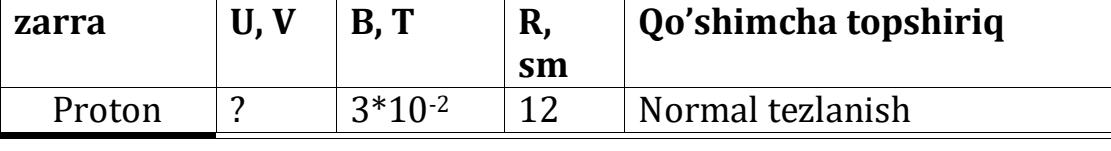
7	<p>EYuK lari $\varepsilon_1=12$ V, $\varepsilon_2=5$ V va $\varepsilon_3=10$ V va $r=1$ Om, bir xil ichki qarshilikli uchta batareya bir xil ismli qutblari bilan o'zaro ulangan. Tutashtiruvchi simlarning qarshiliklari juda kichik. Har bir batareyadan oqayotgan tok kuchi I aniqlansin. $R_1=9$ Om, $R_2=14$ Om, $R_3=19$ Om</p>	
8	<p>Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinci o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.</p>	
9	<p>EYuK lari $\varepsilon_1=11$ V, $\varepsilon_2=4$ V va $\varepsilon_3=6$ V bo'lgan uchta tok manbai va $R_1=5$ Om, $R_2=10$ Om va $R_3=2$ Om qarshilikli uchta reostat rasmda ko'rsatilagandek qilib ulangan. Reostatlardagi tok kuchlari I aniqlansin. Tok manbalarining ichki qarshiliklari hisobga olmaydigan darajada kichik.</p>	
10	<p>Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinci o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.</p>	
11	<p>Reostat uchlarida kuchlanish tushuvi va har bir elementdagи tok kuchi topilsin (rasm). Bunda $\varepsilon_1=8$ V, $r_1=1$ Om, $\varepsilon_2=4$ V, $r_2=0.5$ Om va $R=50$ m</p>	
12	<p>Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinci o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.</p>	

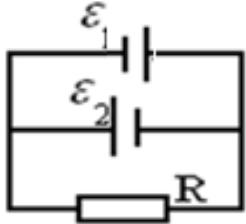
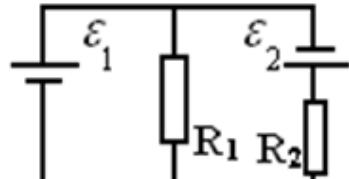
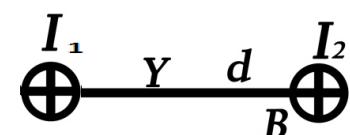
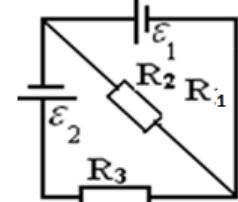
13	r ₁ =2 Om, r ₂ =r ₃ =4 Om va r ₄ =2 Om qarshiliklar va tok manbalari ε ₁ =10 V, ε ₂ =4 V 35-rasmdagidek ulangan bo'lsa, shu qarshiliklardagi kuchlanishlar topilsin. Manbaning qarshiligi etiborga olinmasin.									
14	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I ₁ va I ₂ toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan M nuqtadagi magnit maydon induktsiyasini aniqlang.									
15	Rasmda ε ₁ =4 V, ε ₂ =3 V, r ₁ =2 Om, r ₂ =6 Om, r ₃ =1 Om bo'lsa, r ₃ qarshilikdan o'tuvchi tok kuchi va shu qarshilikda kuchlanish tushuvi topilsin.									
16	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I ₁ va I ₂ toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan Y nuqtadagi magnit maydon induktsiyasini aniqlang.									
17	Rasmdagi zanjirda manbalarni E.Yu.K. ε ₁ =50. ε ₂ =10 V va ichki qarshiliklari r ₁ =1.5 Om, r ₂ =0.5 Om, R ₁ qarshilikda tok kuchi nolga teng bo'lganda, R ₂ qarshilikni qiymati topilsin.									
18	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I ₁ va I ₂ toklarning yo'nalishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AB masofa ma'lum. Ikkinchisi o'tkazgichdan d masofada joylashgan Y nuqtadagi magnit maydon induktsiyasini aniqlang.									
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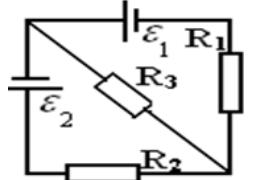
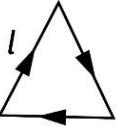
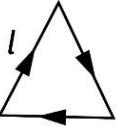
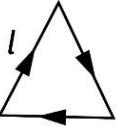
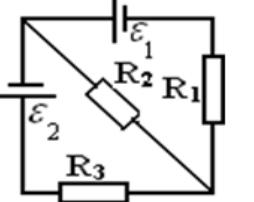
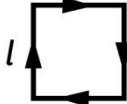
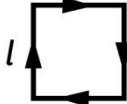
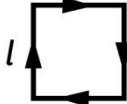
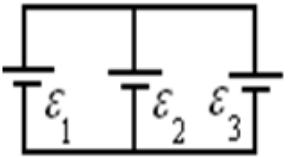
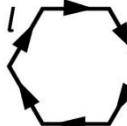
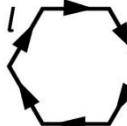
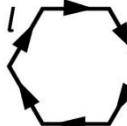
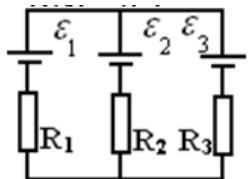
19	<p>Rasmdagi sxemada $\varepsilon_1=10$ V, $\varepsilon_2=2$ V, $R_1=1$ Om, $R_2=4$ Om, $R_3=3$ Om. Zanjirning hamma qismida tok kuchi topilsin. Manbalarni ichki qarshiliklari e'tiborga olinmasin.</p> 							
20	<p>I tok oqayotgan chiziqli o'tkazgich tomoni I bo'lgan muntazam ko'pburchak ko'rinishidagi kontur hosil qilmoqda. Konturning markazidagi magnit induksiya vektorini aniqlang.</p> <table border="1" data-bbox="182 534 1156 781"> <thead> <tr> <th data-bbox="182 534 901 586"><i>Tokli konturninng shakli</i></th><th data-bbox="901 534 1108 586"><i>I, sm</i></th><th data-bbox="1108 534 1156 586"><i>I, A</i></th></tr> </thead> <tbody> <tr> <td data-bbox="182 586 901 781">  </td><td data-bbox="901 586 1108 781">Tomoni I bo'lgan muntazam uchburchak.</td><td data-bbox="1108 586 1156 781">3</td><td data-bbox="1108 586 1156 781">2,2</td></tr> </tbody> </table>	<i>Tokli konturninng shakli</i>	<i>I, sm</i>	<i>I, A</i>		Tomoni I bo'lgan muntazam uchburchak.	3	2,2
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	Tomoni I bo'lgan muntazam uchburchak.	3	2,2					
21	<p>rasmdagi sxemada $\varepsilon_1=4$ V, $\varepsilon_2=2$ V, $R_1=5$ Om, $R_2=10$ Om, $R_3=5$ Om. Zanjirning hamma qismilaridagi tok kuchi topilsin. Manbalarning ichki qarshiliklari e'tiborga olinmasin.</p> 							
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	Tomoni I bo'lgan kvadrat	5	2					
23	<p>Uchta tok manbai $\varepsilon_1=1$ V, $\varepsilon_2=3$ V, $\varepsilon_3=2$ V rasmda ko'rsatilgadek ulangan. Manbalarning ichki qarshiliklari o'zaro tengdir $r_1=r_2=r_3=0.2$ Om. Zanjirni bo'laklaridagi tok kuchlari topilsin.</p> 							
24	<p>I tok oqayotgan chiziqli o'tkazgich tomoni I bo'lgan muntazam ko'pburchak ko'rinishidagi kontur hosil qilmoqda. Konturning markazidagi magnit induksiya vektorini aniqlang.</p> <table border="1" data-bbox="182 1814 1156 2052"> <thead> <tr> <th data-bbox="182 1814 901 1866"><i>Tokli konturninng shakli</i></th><th data-bbox="901 1814 1108 1866"><i>I, sm</i></th><th data-bbox="1108 1814 1156 1866"><i>I, A</i></th></tr> </thead> <tbody> <tr> <td data-bbox="182 1866 901 2052">  </td><td data-bbox="901 1866 1108 2052">Tomoni I ga teng muntazam oltiburchak</td><td data-bbox="1108 1866 1156 2052">2</td><td data-bbox="1108 1866 1156 2052">2</td></tr> </tbody> </table>	<i>Tokli konturninng shakli</i>	<i>I, sm</i>	<i>I, A</i>		Tomoni I ga teng muntazam oltiburchak	2	2
<i>Tokli konturninng shakli</i>	<i>I, sm</i>	<i>I, A</i>						
	Tomoni I ga teng muntazam oltiburchak	2	2					

25	E.Yu.K. lari $\varepsilon_1=10$ V, $\varepsilon_2=5$ V, $\varepsilon_3=3$ V bo'lgan manbalar $R_1=1$ Om, $R_2=2$ Om, $R_3=3$ Om qarshiliklar bilan rasmda ko'rsatilgandek ulangan. Qarshiliklardagi tok kuchi topilsin. Manbalarni ichki qarshiliklari etiborga olinmasin.																			
26	E.Yu.K.lari $\varepsilon_1=2$ V, $\varepsilon_2=1.2$ V bo'lgan manbalar va $R_1=900$ Om, $R_2=300$ Om qarshiliklar rasmdagidek ulangan bo'lsa, galvanometr qanday tok kuchini ko'rsatadi? R_1 qarshiliklarda kuchlanish tushuvi $U_1=2$ V. Manbalarni ichki qarshiliklari etiborga olinmasin.																			
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28	EYuK $E_1=E_2=4$ V, $E_3=6$ V bo'lgan uchta tok manbai va $R=3$ Om li reostat rasmda tasvirlanganidek ulangan. Agar $r_1=r_3=1$ Om, $r_2=2$ Om bo'lsa, reostatdagi tok kuchini toping.																			
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36	<p>Rasmda tasvirlangan zanjirda $R_1=R_2=R_3=R_4=10 \text{ Om}$, $\varepsilon_1=1,5 \text{ V}$, $\varepsilon_2=1,8 \text{ V}$. Manbalar ichki qarshiliklarini hisobga olmagan holda qarshiliklardagi toklarni toping.</p>													
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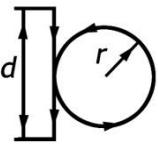
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40	Agar ikkita akkumulyatorlar batareyalari $\varepsilon_1=10$ V; $\varepsilon_2=8$ V va reostat ($R=6$ Om) rasmida tasvirlanganidek zanjirga ulangan bo'lsa, u holda ushbu reostatdan qanday tok oqib o'tadi? Tok manbaining ichki qarshiligini hisobga olmang.	
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42	Agar rasmida tasvirlangan manbalar ichki qarshiliklari $r_1=1,5$ Om $r_2=0,5$ Om, EYuK $\varepsilon_1=50$ V, $E_2=10$ V bo'lsa, u holda tok 0 ga teng bo'lgan holda R_1 qarshilikni toping.	
43	Zaryadlangan zarra bir jinsli magnit maydoniga α burchak ostida uchib kiradi va R radiusli aylana chizib spiral bo'ylab harakatlana boshlaydi. Magnit maydon induktsiyasi – B ga , zarraning kinetik energiyasi esa – W_k ga teng. Topshiriqning raqamiga mos ravishda noma'lum kattalikni toping, qo'shimcha topshiriqni bajaring	

44	Agar rasmida tasvirlangan $E_1=10$ V, $r_1=1$ Om, $\varepsilon_2=5$ V, $r_2=0,5$ Om i $R=50$ Om bo'lsa, u holda manbalardagi toklar va rezistor qarshiligini toping.																									
45	3. Elektromagnit qutblari o'rtasida V induktsiyaga teng bo'lgan bir jinsli magnit maydoni hosil qilingan. Maydon qutblari orasida I uzunlikdagi o'tkazgich kuch chiziqlariga α burchak ostida joylashtirilgan va undan oqayotgan zaryad $q=f(t)$ qonuniyatga muvofiq o'zgarmoqda. O'tkazgichga ta'sir qiluvchi kuch F ga teng. Noma'lum kattalikni toping.	<table border="1"><thead><tr><th>Topshiriq raqami</th><th>$q=f(t)$, C</th><th>I, m</th><th>B, T</th><th>α, grad</th><th>F, N</th></tr></thead><tbody><tr><td>1</td><td>$q=0.5t+2$</td><td>?</td><td>$3 \cdot 10^{-2}$</td><td>30</td><td>$1.5 \cdot 10^{-4}$</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Topshiriq raqami	$q=f(t)$, C	I , m	B, T	α , grad	F, N	1	$q=0.5t+2$?	$3 \cdot 10^{-2}$	30	$1.5 \cdot 10^{-4}$												
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46	Rasmdagi zanjirda manbalarni E.Yu.K. $\varepsilon_1=50$. $\varepsilon_2=10$ V va ichki qarshiliklari $r_1=1.5$ Om, $r_2=0.5$ Om, R_1 qarshilikda tok kuchi nolga teng bo'lganda, R_2 qarshilikni qiymati topilsin.																									
47	Ikkita to'g'ri cheksiz uzun o'tkazgich bir biriga perpendikulyar joylashtirilgan. I_1 va I_2 toklarning yo'naliishlari rasmda ko'rsatilgan. O'tkazgichlar orasidagi AV masofa ma'lum. Ikkinchisi o'tkazgichidan d masofada joylashgan Y nuqtadagi magnit maydon induktsiyasini aniqlang.																									
48	Rasmda tasvirlangan zanjirdagi $\varepsilon_1=4$ V, $\varepsilon_2=2$ V, $R_1=5$ Om, $R_2=10$ Om, $R_3=5$ Om. Zanjir har bir qismidagi tok kuchini toping. Elementlar ichki qarshiliklarini hisobga olmang.																									
49	Ikkita R_1 va R_2 radiusli o'ramlar bir-biridan l ipasofada parallel teksiliklarda joylashgan. O'ramlardan I_1 va I_2 toklar oqib o'tadi. Bu o'ramlar markazlaridan o'tuvchi va 1-o'ramdan 2-o'ramga tomon r masofada joylashgan nuqtadagi magnit maydon induktsiyasini toping. $V=f(r)$ bog'lanish grafigini yasang.	<table border="1"><thead><tr><th>Nomer zadaniya</th><th></th><th>R_1, m</th><th>R_2, m</th><th>I_1, A</th><th>I_2, A</th><th>l, m</th><th>r, m</th></tr></thead><tbody><tr><td>1</td><td>Qarama-qarshi</td><td>0,3</td><td>0,4</td><td>3</td><td>3</td><td>0,01</td><td>0,02</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Nomer zadaniya		R_1 , m	R_2 , m	I_1 , A	I_2 , A	l , m	r , m	1	Qarama-qarshi	0,3	0,4	3	3	0,01	0,02								
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50	Rasmdagi sxemada $\varepsilon_1=10$ V, $\varepsilon_2=2$ V, $R_1=1$ Om, $R_2=4$ Om, $R_3=3$ Om. Zanjirning hamma qismida tok kuchi topilsin. Manbalarni ichki qarshiliklari e'tiborga olinmasin.							
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54	Uchta tok manbai $\varepsilon_1=1$ V, $\varepsilon_2=3$ V, $\varepsilon_3=2$ V rasmda ko'rsatilgadek ulangan. Manbalarning ichki qarshiliklari o'zaro tengdir $r_1=r_2=r_3=0.2$ Om. Zanjirni bo'laklaridagi tok kuchlari topilsin.							
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57

I tok oqayotgan chiziqli o'tkazgich tomoni **I** bo'lgan muntazam ko'pburchak ko'rinishidagi kontur hosil qilmoqda. Konturning markazidagi magnit induksiya vektorini aniqlang.

Tokli konturninng shakli	<i>l, sm</i>	<i>r, sm</i>	<i>I, A</i>	
	<i>l</i> uzunlikdagi o'tkazgich <i>r</i> radiusli halqa va <i>d</i> uzunlikdagi to'g'ri qism hosil qilmoqda	2	1	5

Testlar

ELEKTROSTATIKA

1. Quyiga keltirilgan ta'riflardan zaryadning XBT (SI) tizimidagi birligini tanlang.

- A) 1 kulon – bu tok kuchi 1 A bo'lganda otkazgichning ko'ndalang kesimidan 1 min da oqib o'tadigan zaryad
- B) 1 kulon – bu tok kuchi 1 A bo'lganda otkazgichning ko'ndalang kesimidan 1 s da oqib o'tadigan zaryad
- C) 1 kulon – bu tok kuchi 1 A bo'lganda otkazgichning ko'ndalang kesimi birlik yuzasidan 1 s da oqib o'tadigan zaryad
- D) 1 kulon – bu shunday zaryadki, u vakuumda joylashtirilgan, unga teng bo'lgan zaryadga 1 m masofada 1 N kuch bilan ta'sir etadi.

2. Vakuumda elektrostatik maydon qanday hosil qilinadi:

- A) Qo'zg'almas elektr zaryadlari bilan
- B) Magnitlangan jismlar bilan.
- C) Harakatdagi elektr zaryadlari bilan
- D) Elektr toki bilan
- E) O'zgaruvchan magnit maydonlari bilan

3. Elektrostatik maydon quyidagi keltirilgan xususiyatlarning qaysi biriga ega?

- A) Moddiy jismga kuch ta'siri o'tkazadi.
- B) Zaryadlangan zarrachalar yoki jismga kuch ta'siri o'tkazadi.
- C) Tokli o'tkazgichga kuch ta'siri o'tkazadi.
- D) Energiyaga ega.
- E) Vaqt bo'yicha o'zgaruvchi magnit maydoniga asoslangan

4. Quyidagi keltirilgan ta'riflardan qaysi biri elektr zaryadining saqlanish qonunini ifodelaydi?

- A) Har qanday jismning zaryadi elementar zaryadga butun karrali hisoblanadi:

$$q = \pm Ne$$
- B) Istalgan yopiq tizimda zaryadlangan jismlar elektr zaryadlarining algebraik yig'indisi o'zgarmaydi

$$q_1 + q_2 + q_3 + \dots + q_n = const$$
- C) Elektr zaryadlari paydo ham bo'lmaydi, yo'qolmaydi ham.
- D) Elektr yopiq tizimda musbat zaryadlar soni manfiy zaryadlar soniga teng.
- 5. Dielektrik muhit uchun Kulon qonuni ifodasini aniqlang.

A) $F = k \frac{q_1 q_2}{\epsilon r^2}$

B) $\vec{F} = \frac{1}{4\pi\epsilon_0} \iint_{q_1 q_2} \frac{dq_1 dq_2}{r^3} \vec{r}$

C) $F = k \frac{q_1 q_2}{r^2}$

D) $F = k \frac{q_1 q_2}{\epsilon r}$

6. Vakuum (bo'shliq) uchun Kulon qonuni ifodasini aniqlang:

A) $F = k \frac{q_1 q_2}{\epsilon r^2}$

B)

$\vec{F} = \frac{1}{4\pi\epsilon_0} \iint_{q_1 q_2} \frac{dq_1 dq_2}{r^3} \vec{r}$

C) $F = k \frac{q_1 q_2}{r^2}$

D) $F = k \frac{q_1 q_2}{\epsilon r}$

7. Makroskopik zaryadlangan jismlar uchun Kulon qonuni ifodasini aniqlang.

A) $F = k \frac{q_1 q_2}{\epsilon r^2}$

B)

$\vec{F} = \frac{1}{4\pi\epsilon_0} \iint_{q_1 q_2} \frac{dq_1 dq_2}{r^3} \vec{r}$

C) $F = k \frac{q_1 q_2}{r^2}$

D) $F = k \frac{q_1 q_2}{\epsilon r}$

8.. Zaryadlangan o'tkazgichning ortiqcha statik elektr miqdori qaerda joylashgan?

A) Faqat o'tkazgich ichida.

B) Faqat o'tkazgich sirtida.

C) O'tkazgich sirtida va ichida.

D) Butun hajm bo'yicha.

9. q va $-2q$ elektr zaryadlarini tashuvchi ikkita bir xil o'tkazgich bir-biriga tekkizildi. Tekkizilgandan keyin har qaysi o'tkazgichning zaryadi qanday bo'ladi?

A) $-q$

C) $-q/2$

B) q

D) $q/2$

10. Nuqtaviy zaryadlar orasidagi ta'sir kuchini 2 marta kamaytirish uchun, ular

orasidagi masofani qanchaga o'zgartirish kerak?

A) $\sqrt{2}$ marta oshirish

B) $\sqrt{2}$ marta kamaytirish

C) 4 marta oshirish

D) $\sqrt{3}$ marta oshirish

E) $\sqrt{3}$ marta kamaytirish

11. Ikkita nuqtaviy zaryadlarni nisbiy dielektrik singdiruvchanligi ϵ bo'lgan muhitdan vakuumga (bo'shliqqa) ko'chirilganda, ularning ta'sir kuchi qanday o'zgaradi.

(zaryadlar orasidagi masofa $r = const$)

A) ϵ marta ortadi

B) ϵ marta kamayadi

C) $\epsilon_0 \epsilon$ marta kamayadi

D) $\epsilon_0 \epsilon$ marta ortadi

12. Elektr zaryadi $q_1=2$ nC bo'lgan suv tomchisi, $q_2=-4$ nC zaryadli boshqa suv tomchisi bilan birlashtirilgan. Xosil bo'lgan tomching zaryadi qanday bo'ladi?

A) 2 nC

B) -2 nC

C) -3 nC

D) 3 nC

E) 6 nC

13. Ikkita nuqtaviy zaryadlar orasidagi masofani 2 marta kamaytirsak, ularning o'zaro ta'sir kuchi qanday o'zgaradi?

A. 2 marta kamayadi

B. 4 marta kamayadi

C. 2 marta ortadi

D. 4 marta ortadi

14.. Elektrostatik maydon kuchlanganligining fizik ma'nosini aniglang?

A) Maydonning kuch xarakteristikasi

B) Maydon tomonidan, maydonning shu nuqtasida joylashgan birlik musbat zaryadga ta'sir etuvchi kuchga miqdoran

teng bo'lgan, va kuch ta'siri tomon yo'nalgan kattalik.

C) Maydonning ixtiyoriy nuqtasiga joylashtirilgan nuqtaviy birlik musbat sinov zaryadi potensiali energiyasining, shu zaryadga nisbatiga teng bo'lган kattalik

D) Maydonning energetik xarakteristikasi

15. Kuchlanganligi $2 \cdot 10^2 \text{ N/C}$ bo'lган elektr maydoniga 10^{-7} C zaryad kiritildi. Zaryadga qanday kuch ta'sir etadi?

- A) $2 \cdot 10^{-5} \text{ N}$ B) $2 \cdot 10^{-5} \text{ C}$ C)
 $0,5 \cdot 10^{-5} \text{ N}$ D) $0,5 \cdot 10^{-5} \text{ C}$

16. Qaysi formula elektr maydon kuchlanganligini ifodalaydi?

- A) $\vec{E} = \frac{\vec{F}}{q}$ B) $\vec{E} = \frac{1}{4\pi\epsilon_0} \frac{q}{\epsilon r^2} \frac{\vec{r}}{r}$
 C) $\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 + \dots + \vec{E}_n$
 D) $E = (\varphi_1 - \varphi_2) \cdot q$

17. Nuqtaviy zaryadning elektrostatik maudon kuchlanganligi formulasini aniqlang:

- A) $E = \frac{\sigma}{2\epsilon_0\epsilon}$ B) $E = \frac{q}{4\pi\epsilon_0\epsilon r^2}$
 C) $E = \frac{\tau}{2\pi\epsilon_0\epsilon a}$ D) $E = \frac{\sigma}{\epsilon_0\epsilon}$

18. Cheksiz, tekis zaryadlangan tekislikning elektrostatik maudon kuchlanganligini aniqlang:

- A) $E = \frac{\sigma}{2\epsilon_0\epsilon}$ B) $E = \frac{q}{4\pi\epsilon_0\epsilon r^2}$
 C) $E = \frac{\tau}{2\pi\epsilon_0\epsilon a}$ D) $E = \frac{\sigma}{\epsilon_0\epsilon}$

19. Cheksiz, tekis zaryadlangan ipning elektrostatik maudon kuchlanganligini aniqlang:

- A) $E = \frac{\sigma}{2\epsilon_0\epsilon}$ B) $E = \frac{q}{4\pi\epsilon_0\epsilon r^2}$
 C) $E = \frac{\tau}{2\pi\epsilon_0\epsilon a}$ D) $E = \frac{\sigma}{\epsilon_0\epsilon}$

20. Zaraydlar sirt zichligini ifodalovchi formulani ko'rasting:

- A) $\rho = \frac{dq}{dV}$ B) $\sigma = \frac{dq}{dS}$
 C) $\tau = \frac{dq}{dl}$ D) $\sigma = \frac{dq}{dr}$

21. Zaryadlar chiziqli zichligi ifodasini ko'rsating:

- A) $\rho = \frac{dq}{dV}$ B) $\sigma = \frac{dq}{dS}$
 C) $\tau = \frac{dq}{dl}$ D) $\sigma = \frac{dq}{dr}$

23. Elektronning xarakteristikasini to'g'ri ko'rsating:

- A) $e = -1,6 \cdot 10^{-19} \text{ C}$
 $m = 9,1 \cdot 10^{-31} \text{ kg}$
 B) $e = -1,6 \cdot 10^{-19} \text{ C}$
 $m = 1,67 \cdot 10^{-27} \text{ kg}$
 C) $e = -1,6 \cdot 10^{-19} \text{ C}$
 $m = 1,67 \cdot 10^{-31} \text{ kg}$
 D) $e = 1,6 \cdot 10^{-19} \text{ C}$
 $m = 9,1 \cdot 10^{-31} \text{ kg}$

24. 2 sm li metalli sferik qobiqda $1 \mu\text{C}$ li zaryad joylashgan. Sfera markazida maydon kuchlanganligi qanday?

- A) 0 N/C B) 6 N/C

- C) 4 N/C
D) 2 N/C

25..Elektr maydonlar superpozitsiya prinsipi nimadan iborat?

A) Tizim zaryadlari maydon kuchlanganligi alohida zaryadlar hosil qilgan maydon kuchlanganliklarining algebraik yig'indisiga teng:
 $E = E_1 + E_2 + E_3 + \dots + E_n$.

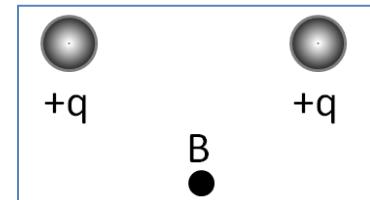
B) Tizim zaryadlari maydon kuchlanganligi alohida zaryadlar hosil qilgan maydon kuchlanganliklarining vektor yig'indisiga teng:

$$\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 + \dots + \vec{E}_n.$$

C) Elektr maydon kuchlanganligi zaryadga ta'sir etuvchi kuchning, shu zaryad kattaligiga nisbatiga teng: $\vec{E} = \frac{\vec{F}}{q}$.

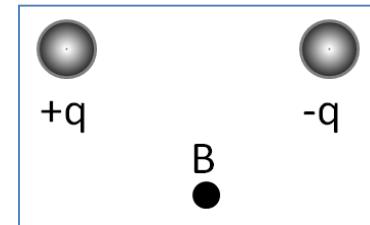
26.B nuqtada ikkita zaryad hosil qilgan elektr maydon kuchlanganligi qayerga yo'nalgan?

- A) o'ngga B) chapga
C) yuqoriga D) pastga



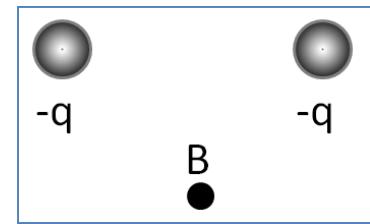
27. B nuqtada ikkita zaryad hosil qilgan elektr maydon kuchlanganligi qayerga yo'nalgan?

- A) o'ngga B) chapga
C) yuqoriga D) pastga



28. B nuqtada ikkita zaryad hosil qilgan elektr maydon kuchlanganligi qayerga yo'nalgan?

- A) o'ngga B) chapga
C) yuqoriga D) pastga



29.Ikkita $6q$ va $2q$ nuqtaviy zaryad $0,3$ N kuch bilan ta'sirlashmoqda. Zaryadlarni ulaganda va avvalgi masofaga ajratilganda, ularning o'zaro ta'sir kuchi nimaga teng?

- A) 0,1 N B) 0,2 N
C) 0,3 N D) 0,4 N

30. Bir-biridan 12 m masofada joylashgan $3 \mu\text{C}$ l va $4 \mu\text{C}$ li nuqtaviy zaryadlarning tortishish kuchi qanday?
A) 1 kN B) 900 N
C) 750 N D) 600 N

31.Ikkita nuqtaviy zaryad $5 \mu\text{C}$ kuch bilan ta'sirlashmoqda.Zaryadlar

orasidagi masofani 2 marta oshirsak,
ular qanday kuch bilan ta'sirlashadi?

- A) $1,25 \mu\text{N}$ B) $10 \mu\text{N}$
C) $12,5 \mu\text{N}$ D) $10 \mu\text{N}$

32. Elektrostatik maydon kuchlanganligi vektori tsirkulyatsiyasi uchun ifodani aniqlang:

- A) $\oint E_n dS = \sum q_i$
B) $\oint E_\ell d\ell = 0$
C) $\oint E_\ell d\ell = \sum q_i$
D) $\oint E_\ell d\ell = \sum q_i$

33. Elektr maydon kuchlanganligi oqimi uchun Ostrogradskiy- Gauss teoremasini ta'riflang va uning matematik ifodasini yozing?

A) Vakuumda, ixtiyoriy yopiq sirt orqali elektrostatik maydon kuchlanganligi vektori oqimi, shu sirt bilan chegaralangan elektr zaryadlari algebraik yig'indisining elektr doimiyisiga nisbatiga teng.

$$\Phi_E = \oint E_n dS = \frac{\sum q}{\epsilon_0}$$

B) Elektr maydon kuchlanganligi vektori tsirkulyatsiyasi nolga teng.

$$\oint Edl = 0$$

C) Vakuumda, ixtiyoriy yopiq sirt orqali elektrostatik maydon kuchlanganligi vektori oqimi nolga teng.

$$\Phi_E = \oint E_n dS = 0$$

D) Yopiq sirtga kiruvchi kuch chiziqlari oqimi, ushbu sirdan chiquvchi kuch chiziqlari oqimiga teng.

$$d\Phi = -d\Phi$$

34. Vakuumda elektrostatik maydon uchun Gauss teoremasi ifodasini ko'rsating:

$$A) \Phi_E = \oint_S E_n dS = \frac{1}{\epsilon_0} \sum_{i=1}^n q_i$$

$$B) \Phi_E = \oint_S E_n dS = \frac{1}{\epsilon \epsilon_0} \sum_{i=1}^n q_i$$

$$C) \Phi_E = \oint_S E_n dS = \sum_{i=1}^n q_i$$

$$D) \Phi_E = \oint_S E_n dS = 0$$

35. Zaryadlar quyidagi ishorali bo'lganda: $-q_1, +q_2, -q_3, +q_4$,

yopiq sirt (S_3) orqali kuchlanganlik vektori oqimini (Φ_E) aniqlang

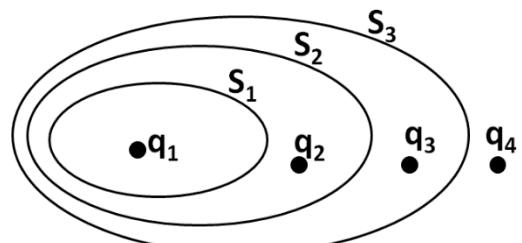
$$A) \frac{q_1 + q_2 + q_3 + q_4}{\epsilon_0}$$

$$B) \frac{-q_1 + q_2 - q_3}{\epsilon_0}$$

$$C) \frac{-q_1 + q_2 - q_3 + q_4}{\epsilon_0}$$

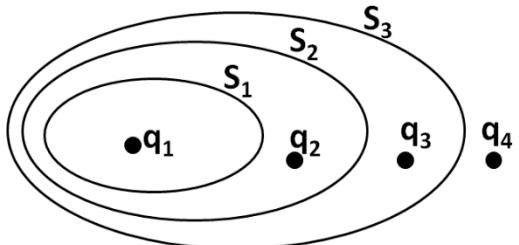
$$D) \frac{+q_3}{\epsilon_0}$$

$$E) \frac{-q_1 + q_2}{\epsilon_0}$$



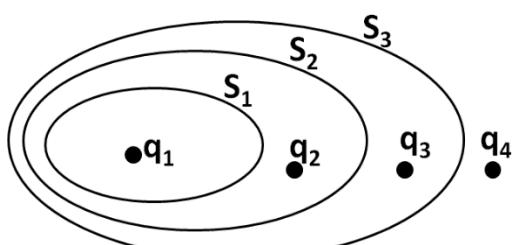
36. Zaryadlar quyidagi ishorali bo'lganda: $-q_1, +q_2, -q_3, +q_4$,
yopiq sirt (S_2) orqali kuchlanganlik vektori
oqimini(Φ_E) aniqlang :

- A) $\frac{q_1 + q_2 + q_3 + q_4}{\epsilon_0}$ B) $\frac{-q_1 + q_2 - q_3}{\epsilon_0}$
 C) $\frac{-q_1 + q_2 - q_3 + q_4}{\epsilon_0}$ D) $\frac{+q_3}{\epsilon_0}$
 E) $\frac{-q_1 + q_2}{\epsilon_0}$



37. Zaryadlar quyidagi ishorali bo'lganda: $-q_1, +q_2, -q_3, +q_4$,
yopiq sirt (S_1) orqali kuchlanganlik vektori
oqimini(Φ_E) aniqlang :

- A) $\frac{q_1 + q_2 + q_3 + q_4}{\epsilon_0}$ B) $\frac{-q_1 + q_2 - q_3}{\epsilon_0}$
 C) $\frac{-q_1 + q_2 - q_3 + q_4}{\epsilon_0}$ D) $\frac{+q_3}{\epsilon_0}$
 E) $\frac{-q_1 + q_2}{\epsilon_0}$



38. Elektr o'lchov birliklari ketma-ketligini ko'rsating

1.zaryad, 2. potensial, 3. energiya

- A) [C], [V], [J] B) [C], [J], [V]
 C) [J], [V] D) [J], [C], [V]

- C) 4 N/C
 D) 2 N/C

39. Yassi kondensator plastinkalari orasidagi elektr maydon kuchlanganligi 40 V/m. Plastinkalar orasidagi masofa 2 sm. Plastinkalar orasidagi kuchlanish nimaga teng?

- A) 2 kV B) 80 V
 C) 20 V D) 0,8 V

40. 2 sm li metalli sferik qobiqda 1 mkKl li zaryad joylashgan. Sfera markazida maydon kuchlanganligi qanday?

- A) 0 N/C B) 6 N/C

41. Zaryaddan 5 sm masofada maydon kuchlanganligi $1,5 \cdot 10^3$ N/C. Zaryad qiymatini toping.

- A) 37,5 C B) $37,5 \cdot 10^{-8}$ C
 C) $4,2 \cdot 10^{-8}$ C D) $337,5 \cdot 10^{-8}$ C

42. Elektrostatik maydon potensiali nima?

- A) Maydonning o'r ganilayotgan nuqtasiga joylashtirilgan nuqtaviy birlik musbat sinov zaryadi potensial energiyasining, shu zaryadga nisbatiga teng bo'lgan kattalik.
 B) Maydonning energetik xarakteristikasi.

C) Maydon tomonidan, maydonning shu nuqtasida joylashgan birlik musbat zaryadga ta'sir etuvchi kuchga miqdoran teng bo'lgan, va kuch ta'siri tomon yo'nalgan kattalik.

D) Birlik ,musbat sinov zaryadiga ta'sir etuvchi kuch.

43.Elektrostatik maydonning potensiallik sharti

A) $\oint_{(s)} E_n dS = \frac{q}{\epsilon_0}$

B) $\oint_{(l)} E_l dl = 0$

C) $\oint_{(s)} \vec{E} \cdot d\vec{S} = q$

D) $\oint_{(s)} D_n dS = \sum q_i$

44. Yopiq traektoriya bo'ylab birlik musbat zaryadni ko'chirishda bajarilgan ish nimaga bog'liq?

A) Kulon kuchining radius vektorga ko'paytmasiga teng.

B) Zaryad kattaligi va yo'l uzunligiga proporsional bo'lib, traektoriyaning boshlang'ich va oxirgi holatiga bog'liq emas.

C) Yo'l uzunligiga va maudonni hosil qiluvchi va shu maudon bo'ylab ko'chuvchi zaryadlar kattaliklariga bog'liq emas.

D) Nolga teng bo'lib, traektoriyaning boshlang'ich va oxirgi nuqtalari potensiallariga bog'liq.

45. Yo'l uzunligini **n** marta oshirilsa, ekvipotensial sirt bo'ylab zaryadni ko'chirishda bajarilgan ish qanady o'zgaradi?

- A) O'zgarmaydi .
- B) **n** marta ortadi.
- C) **n** marta kamayadi.
- D) Doim nolga teng.

46. \vec{E} vektor va φ potensial orasidagi bog'lanish formulasini aniqlang.

A) $\varphi_1 - \varphi_2 = \frac{E}{d}$

B) $E = (\varphi_1 - \varphi_2) \cdot q$

C) $\varphi = -\frac{\Delta E}{d}$

D) $\vec{E} = -\text{grad}\varphi$

47. Elektrostatik maydonning kuch chiziqlari deb nimaga aytildi?

A) Kuchlanganliklari teng nuqtalarning geometrik o'rni bo'lgan egri chiziqlar;

B) Har bir nuqtasidan o'tkazilgan urinma zaryadning, shu nuqtasidagi tezlik vektorining yo'nalishiga moc keluvchi egri chiziqlar;

C) Potensiali teng nuqtalarning geometrik o'rni bo'lgan egri chiziqlar;

D) Egri chiziqqa o'tkazilgan urinmalar elektr maydon kuchlanganligi vektroriga mos tushadi;

E) Egri chiziqning har bir nuqtasiga o'kazilgan urinma zaryadning ko'chish vektori yo'nalishiga mos tushadi.

48.Elektr maydonning bir jinslilik shartini ko'rsating.

- A) Kuch chiziqlari yopiq;
- B) Kuchlanganlik barcha nuqtalarda kattalik bo'yicha bir xil;
- C) Kuchlanganlik barcha nuqtalarda yo'nalish bo'yicha bir xil;
- D) Kuchlanganlik barcha nuqtalarda kattalik va yo'nalish bo'yicha bir xil;
- E) Potensial barcha nuqtalarda kattalik bo'yicha bir xil.

48. Qanday sirt ekvipotensial sirt deyiladi?

- A) barcha nuqtalari bir xil potensialga ega bo'lgan sirt
- B) elektr maydonidagi har qanday jismning sirti
- C) har qanday zaryadlangan jism egallashi mumkin bo'lgan sfera shaklli sirt
- D) maydonni fazoda taqsimlanishini miqdoran xarakterlovchi sirtlar
- E) bir jinsli elektrostatik maydon kuch chiziqlariga parallel sirt

49. Dielektrikda («XBT») tizim nuqtaviy zaryadlarining potensial energiyasi:

$$A) W = \frac{qq'}{\epsilon\epsilon_0 r} \quad B) W = \frac{qq'}{4\pi\epsilon_0\epsilon r^2}$$

$$C) W = \frac{qq'}{4\pi\epsilon_0\epsilon r} \quad D) W = \frac{qq'}{4\pi\epsilon_0 r}$$

50. Superpozitsiya prinsipini ifodalovchi formulani ko'rsating:

$$1) \vec{E} = \sum_{i=1}^n \vec{E}_i \quad 2) \oint_l E_l dl = 0$$

$$3) \varphi = \frac{\sum q_i}{4\pi\epsilon_0 r} \quad 4) \Delta\varphi = 0$$

$$5) \varphi = \sum_{i=1}^n \varphi_i$$

- A) 1,5
- B) 1,3,5
- C) 3,5
- D) 1,2

51. Nuqtaviy zaryadning elektr maydon potensialini ifodalovchi formulani aniqlang?

$$A) \varphi = \frac{q}{C} \quad B) \varphi = \frac{1}{4\pi\epsilon_0} \frac{q}{\epsilon r}$$

$$C) \varphi_1 - \varphi_2 = \frac{\sigma}{2\epsilon_0} (x_2 - x_1)$$

$$D) \varphi = const$$

52. Qaysi formula cheksiz zaryadlangan tekislik elektr maydonining potensiallar farqini ifodalaydi?

$$A) \varphi = \frac{q}{C} \quad B) \varphi = \frac{1}{4\pi\epsilon_0} \frac{q}{\epsilon r}$$

$$C) \varphi_1 - \varphi_2 = \frac{\sigma}{2\epsilon_0} (x_2 - x_1)$$

$$D) \varphi_1 - \varphi_2 = \frac{\sigma}{\epsilon_0} d$$

53. Qaysi formula ikkita zaryadlangan parallel cheksiz tekisliklar elektr maydoni potensiallar farqini ifodalaydi?

$$A) \varphi = \frac{q}{C} \quad B) \varphi = \frac{1}{4\pi\epsilon_0} \frac{q}{\epsilon r}$$

$$C) \varphi_1 - \varphi_2 = \frac{\sigma}{2\epsilon_0} (x_2 - x_1)$$

$$D) \varphi_1 - \varphi_2 = \frac{\sigma}{\epsilon_0} d$$

54. Potensiallar farqi 1600 V bo'lgan elektr maydonning ikki nuqtasi orasiga $5 \cdot 10^{-8}$ C li zaryadni ko'chirishda qanday ish bajarish kerak?

- A) $32 \cdot 10^9$ J
- B) $80 \cdot 10^{-4}$ N
- C) $8 \cdot 10^{-5}$ J
- D) 1100 J

55. Potensialllar farqi 8 V bo'lgan nuqtalar orasiga zaryadni ko'chirishda, elektr maydoni tomonidan zaryadga ta'sir etuvchi kuchlarning bajargan ishi 4 J. **q** zaryad nimaga teng?

- A) 0,5 C B) 32 C C) 2 C D) 12 C
 E) 4 C.

56.Zaryadni elektrostatik maydonning bir nuqtasidan ikkinchisiga ko'chirishda bajarilgan ish ... bog'liq emas.

- A) potensiallar farqiga
 B) nuqtalar orasidagi masofaga
 C) zaryad ko'chish traektoriyasiga
 D) kuchlanganlikka
 E) zaryad miqdoriga

57.Maydonning ikki nuqtasi orasiga $3 \cdot 10^{-6}$ C zaryadni ko'shirishda $7,5 \cdot 10^{-3}$ J ish bajarildi. Nuqtalar orasidagi kuchlanish qanday bo'ladi.

- A) 25 V;
 B) $0,4 \cdot 10^{-3}$ V;
 C) $22,5 \cdot 10^{-9}$ V;
 D) 2500 V;
 E) 400 V.

58. Ekvipotensial sirtlar bo'ylab zaryadni ko'chirishda bajarilgan ish nimaga teng?

- A) $\frac{qq'}{4\pi\epsilon_0 r}$; B) $E_l dl$;
 C) $Eqdl$; D) 0; E) $q\Delta\phi$.

59 Elektrostatik maydonda zaryadni ko'chirishda maydon kuchlari bajargan ishni ifodalovchi formulani («XBT» tizimida) aniqlang:

- A) $A = q\Delta\phi$;
 B) $A = q\left(\frac{1}{4\pi\epsilon_0 r_1} - \frac{1}{4\pi\epsilon_0 r_2}\right)$;
 C) $A = q \cdot \Delta\phi \cdot \Delta l$;
 D) $A = \frac{q_1}{4\pi\epsilon_0 \epsilon} \left(\frac{q_2}{r_1} - \frac{q_2}{r_2}\right)$;
 E) $A = q_1 q_2 \left(\frac{1}{\epsilon_0 \epsilon r_1} - \frac{1}{\epsilon_0 \epsilon r_2}\right)$.

60.Yassi kondensator sig'imi formulasini aniqlang?

A) $C = 4\pi\epsilon_0 \epsilon r$

C) $C = \frac{\epsilon_0 \epsilon S}{d}$

B) $C = 4\pi\epsilon_0 \epsilon \frac{r_1 r_2}{r_1 - r_2}$

D) $C = \frac{2\pi\epsilon_0 \epsilon l}{\ln \frac{r_2}{r_1}}$

61. Sferik kondensator sig'imi formulasini aniqlang?

A) $C = 4\pi\epsilon_0 \epsilon r$

C) $C = \frac{\epsilon_0 \epsilon S}{d}$

B) $C = 4\pi\epsilon_0 \epsilon \frac{r_1 r_2}{r_1 - r_2}$

D) $C = \frac{2\pi\epsilon_0 \epsilon l}{\ln \frac{r_2}{r_1}}$

62.. Silindrli kondensator sig'imi formulasini aniqlang?

A) $C = 4\pi\epsilon_0 \epsilon r$

C) $C = \frac{\epsilon_0 \epsilon S}{d}$

B) $C = 4\pi\epsilon_0 \epsilon \frac{r_1 r_2}{r_1 - r_2}$

D) $C = \frac{2\pi\epsilon_0 \epsilon l}{\ln \frac{r_2}{r_1}}$

63.Shar sig'imi formulasini aniqlang?

A) $C = 4\pi\epsilon_0 \epsilon r$

C) $C = \frac{\epsilon_0 \epsilon S}{d}$

B) $C = 4\pi\epsilon_0\epsilon \frac{r_1 r_2}{r_1 - r_2}$

D) $C = \frac{2\pi\epsilon_0\epsilon l}{\ln \frac{r_2}{r_1}}$

64.Yakkalangan o'tkazgichning elektr sig'imi bu :

- A. O'tkazgich zaryadining, uning potensialiga nisbati bilan o'lchanadigan fizik kattalik .
- B. O'tkagich potensialining uning zaryadiga nisbati bilan o'lchanadigan fizik kattalik . Фи.
- C. O'tkazgich zaryadining uning potensialiga ko'paytmasiga teng fizik kattalik .
- D. Potensiallar farqining o'kazgich zaryadiga nisbatiga teng bo'lgan fizik kattalik .

65.O'tkagichning elektr sig'imi nimaga bog'liq :

- A. O'kazgichning materiali va uning agregat holatiga.
 - B. Uning chiiqli o'lchami va geometrik shakliga .
 - C. O'tkazgich materialining solishtirma elektr qarshiligiga.
 - D. O'tkazgichning temperaturasiga.
- 66.Yakkalangan o'tkazgich elektr sig'imi ifodasini ko'rsating

A) $C = \frac{E}{q}$

B) $C = \frac{\phi}{q}$

C) $C = q\phi$

D) $C = \frac{q}{\phi}$

67. O'tkazgichning elektr sig'imi, unga boshqa o'tkazgichni yaqinlashtirsa qanday o'zgaradi?

- A. O'zgarmaydi
- B. Ortadi
- C. Kamayadi
- D. Faqat yaqinlashganda ortadi, keyin esa dastlabki holatiga qaytadi.

68.Yuzasini 2 marta, ular orasidagi masofani esa 6 marta kamaytirilsa, yassi kondensatorning elektr sig'imi qanday o'zgaradi?

- A. 3 marta kamayadi
- B. 3 marta ortadi
- C. 12 marta kamayadi
- D. 12 marta ortadi
- E. O'zgarmaydi

69. Quyidagi keltirilgan formulalardan qaysilari zaryadlangan kondensator energiyasini ifodalaydi?

A) $W = \frac{CU^2}{2}$ B) $W = \frac{qU^2}{2}$ C) $W = \frac{\epsilon\epsilon_0 E^2}{2}$

D) $W = \frac{q^2}{2C}$

70. Quyidagi keltirilgan formulalardan qaysi biri elektr maydon energiyasining hajmiy zichligini ifodalaydi?

A) $w = \frac{CU^2}{2}$ B) $w = \frac{qU^2}{2}$ C) $w = \frac{\epsilon\epsilon_0 E^2}{2}$

D) $w = \frac{q^2}{2C}$

71.Elektr sig'imi 2 marta kamaytirilsa, tok manbaiga ulangan kondensator energiyasi qanday o'zgaradi?

- A. 2 marta kamayadi
- B. 4 marta kamayadi
- C. 2 marta ortadi
- D. 4 marta ortadi

72. 2 mkF sig'imli kondensator 100 V li tok manbaiga ulanganda qanday zaryad oladi?

A) $2 \cdot 10^{-4} C$ B) $0,5 \cdot 10^8 C$ C) $200 C$

73..O'zgaruvchan sig'imli kondensator zaryadlandi. Kondensator sig'imi 2 marta orttirib, uni tok manbaidan uzilganda, zaryadi qanday o'zgaradi?

- A..2 marta ortadi
- B. 4 marta ortadi

C, 2 marta kamayadi
D. O'zgarmaydi

74. Yassi kondensator plastinkalari yuzasi 2 marta kamaytirildi. Kondensator sig'imi qanday o'zgargan?
A. 2 marta kamaygan
B. O'zgarmagan
C. 2 marta ortgan
D. 4 marta kamaygan
E. 4 marta ortgan

75. Yassi kondensator plastinkalari orasidagi masofa 2 marta orttirildi. Kondensator sig'imi qanday o'zgargan?
A. 2 marta kamaygan
B. O'zgarmagan
C. 2 marta ortgan
D. 4 marta ortgan

76. Havoli kondensator sig'imi $10 \mu\text{F}$. Agar plastinkalar orasi dielektrik singdiruvchanligi $\epsilon = 2$ bo'lган dielektrik bilan to'ldirilsa, bu kondensatorning sig'imi qanday bo'ladi?

- A) $5 \mu\text{F}$
B) $10 \mu\text{F}$
C) $20 \mu\text{F}$
D) $100 \mu\text{F}$

77. Sig'imi $1 \mu\text{F}$ bo'lган kondensatorni 100 V kuchlanishgacha zaryadlaganda, u qanday zaryad yig'adi?
A) 1000 C B) 10^{-4} N C)
 10^{-4} C D)
 10 C

78. Qanday dielektriklar qutblangan deyiladi?

A) Tashqi elektr maydon bo'lмаганда dielektrikdagi molekulalarda musbat va manfiy zaryadlarning «og'irlilik markazlari» mos tushadi va molekulalar dipol momentlari teng.

B) Tashqi elektr maydon bo'lмаганда dielektrikdagi molekulalarda musbat va manfiy zaryadlarning «og'irlilik markazlari» mos tushmaydi va dipol momentlari noldan farqli.

C) Ularning kristall panjarasi qaramaqarshi zaryadlangan ionlardan tashkil topgan.
D) Tashqi elektr maydon bo'lмаганда ham, musbat va manfiy zaryadlarning «og'irlilik markazlari» mos tushmaydi.

79. Qutblanish vektori nimani anglatadi?

A) Dielektrik molekulalarining dipol momenti.
B) Dielektrik ichidagi elektr maydon kuchlanganligi va elektr maydon ko'chish vektori orasidagi bog'lanish.
C) Dielektrikning birlik hajmdagi dipol momenti.
D) Dielektrikning qutblanish darajasi.

80. Dielektrik muhit uchun elektr ko'chish vektori formulasi:

$$\begin{array}{ll} A) \vec{P} = \chi \epsilon_0 \vec{E} & B) \vec{D} = \epsilon_0 \vec{E} + \vec{P} \\ C) P = e \epsilon_0 r & D) P = \frac{ZP_i}{V} \end{array}$$

81. Qutblanmagan molekulalar uchun qutblanishning qaysi turi xarakterli:

A) Elektron yoki deformatsiyali qutblanish
B) Orientatsion yoki dipolli qutblanish
C) Ionli qutblanish
D) Hammasi

82. Qutblangan molekulalar uchun qutblanishning qaysi turi xarakterli.

A) Elektron yoki deformatsiyali qutblanish
B) Orientatsion yoki dipolli qutblanish

- C) Ionli qutblanish
D) Hammasi

83. Elektr siljish vektori \vec{D} ning ma'nosi nima? \vec{D} vektor ... xarakterlaydi.

- A) ...moddada faqat bog'langan zaryadlar hosil qilgan natijaviy maydonni
B) ...dielektrik birlik hajmini qutblanishini
C)...moddada faqat erkin zaryadlar hosil qilgan elektr maydonni va u muhit xususiyatlarga bog'liq emasligini
D)...erkin zaryadlar, hamda bog'langan zaryadlar hosil qilgan elektr maydonni

84. Elektr ko'chish \vec{D} birligini to'g'ri ko'rsating:

- A) $\left[\frac{C}{m^2} \right]$ B) $\left[\frac{C}{m} \right]$
C) $\left[\frac{N}{A \cdot m} \right]$ D) [T]

85. Elektr maydon kuchlanganligi birligini to'g'ri ko'rsating

- A) $\left[\frac{C}{m^2} \right]$ B) $\left[\frac{C}{m} \right]$
C) $\left[\frac{N}{A \cdot m} \right]$ D) [T]

86. Dielektrikda elektrostatik maydon uchun Gauss teoremasini ko'rsating: A)

$$\Phi_D = \oint_S D_n dS = \frac{1}{\epsilon_0} \sum_{i=1}^n q_i \quad B)$$

$$\Phi_D = \oint_S D_n dS = \frac{1}{\epsilon \epsilon_0} \sum_{i=1}^n q_i$$

$$C) \Phi_D = \oint_S D_n dS = \sum_{i=1}^n q_i \quad D)$$

$$\Phi_D = \oint_S D_n dS = 0$$

87. Dielektrikdagi elektrostatik maydon uchun Gauss teoremasini differensial ifodasini ko'rsating (ρ – zaryadning hajmiy zichligi)

$$\operatorname{div} \vec{D} = \epsilon_0 \rho$$

A)

$$\operatorname{div} \vec{D} = \frac{\rho}{\epsilon}$$

B)

C) $\operatorname{div} \vec{D} = \rho$ D) $\operatorname{div} \vec{D} = \frac{\rho}{\epsilon_0}$

88. Zaryadlar sirt zichligi σ bilan dielektrik qutblanish vektori P orasidagi bog'lanish ifodasini aniqlang.

- A) $\sigma = 4\pi P$ B) $\sigma = \frac{P}{4\pi}$
C) $P = \sigma$ D) $P = \frac{4\pi \sigma}{\epsilon_0}$

89. Moddaning dielektrik simmdiruvchanligi ϵ va dielektrik qabul qiluvchanligi χ orasidagi bog'lanishni ko'rsating

- A) $\epsilon = 1 + 4\pi \chi$
B) $\epsilon = 1 + \chi$
C) $\epsilon = 1 + \epsilon_0 \chi$
D) $\chi = 1 + \epsilon$

90. «XBT» tizimida zaryadlarning elektr siljish vektori \vec{D} va qutblanish vektori \vec{P} ni bog'lovchi formulani ko'rsating

- A) $\vec{E} = \vec{D} + \epsilon_0 \vec{P};$ B) $\vec{P} = \vec{D} + \epsilon_0 \vec{E};$
C) $\vec{D} = \vec{P} + \epsilon_0 \vec{E};$
D) $\vec{E} = \vec{D} - \epsilon_0 \vec{P};$ E) $\vec{E} = \vec{D} + \epsilon_0 \vec{E}.$

ELEKTRODINAMIKA

1. Metalli o'tkazgichlarda zaryad tashuvchilar nimalar hisoblanadi?

- A) Erkin elektronlar
- B) Musbat va manfiy ionlar
- C) Musbat ionlar va elektronlar
- D) Elektronlar va kovaklar

2. Tok zichligi uchun ta'rif bering.

A) O'tkazgichning ko'ndalang kesimi birlik yuzasi orqali o'tuvchi tok kuchiga son jihatdan teng bo'lgan kattalik ..

B) O'tkazgichning ko'ndalang kesimidan vaqt birligi ichida o'tuvchi zaryadga son jihatdan teng bo'lgan kattalik.

C) Maydon kuchlanganligini singdiruvchanlikka ko'paytmasiga teng bo'lgan skalyar kattalik.

D) O'tkazgich birlik yuzasi orqali o'tuvchi zaruadga teng bo'lgan kattalik .

3. Keltirilgan formulalardan qaysi biri tok kuchini aniqlaydi ?

A) $I = \frac{dq}{dt}$ B) $I = \frac{U}{R}$ C) $I = \frac{\varepsilon}{R+r}$ D)

$$I = \int_S j dS$$

4. Keltirilgan formulalardan qaysi biri tok zichligini aniqlaydi?

A) $I = \frac{dq}{dt}$ B) $j = \frac{di}{dS}$ C) $j = \frac{1}{\rho E}$
 D) $j = \sqrt{\frac{P}{\rho}}$

5. Formulalardan qaysi biri elektr yurituvchi kuchni aniqlovchi hisoblanadi?

A) $\varepsilon = -L \frac{dI}{dt}$ B) $\varepsilon = \frac{A^{\tilde{n} \circ i \delta}}{q}$

C) $\varepsilon = -\frac{d\Phi}{dt}$ D) $\varepsilon = \frac{1}{ne} \frac{BI}{a}$

6. Keltirilgan formulalardan qaysi biri, tok manbaiga ega bo'lgan berk zanjir uchun Om qonunining ifodasi hisoblanadi?

A) $I = \frac{dq}{dt}$ B) $I = \frac{U}{R}$ C) $I = \frac{\varepsilon}{R+r}$

D) $P = I^2 R$

7. Bir jinsli bo'gan zanjir qismi uchun Om qonunining differensial ko'rinishini aniqlang:

A) $\omega = \frac{E^2}{\rho}$ B) $j = \frac{E}{\rho}$

C) $j = nq_0 < v >$ D) $j = \frac{E}{\sigma}$

8. Bir jinsli bo'lgan zanjir qismi uchun Om qonunining integral ko'rinishini ko'sating:

A) $I = \frac{U}{R}$ B) $I = \frac{\varphi_1 - \varphi_2 + \mathcal{E}_{12}}{R}$

C) $I = \frac{\mathcal{E}}{r}$ D) $I = \frac{\mathcal{E}}{R+r}$

9. Bir jinsli bo'limgan zanjir qismi uchun Om qonunining integral ko'rinishini ko'rsating:

A) $I = \frac{U}{R}$ B) $I = \frac{\varphi_1 - \varphi_2 + \mathcal{E}_{12}}{R}$

C) $I = \frac{\mathcal{E}}{r}$ D) $I = \frac{\mathcal{E}}{R+r}$

10. Qisqa tutashuv tok kuchi formulasini ko'rsating:

A) $I = \frac{U}{R}$ B) $I = \frac{\varphi_1 - \varphi_2 + \mathcal{E}_{12}}{R}$
 C) $I = \frac{\mathcal{E}}{r}$ D) $I = \frac{\mathcal{E}}{R+r}$

11. $\vec{j} = \gamma \vec{E}$ tenglama nimani anglatadi:
- A) Umumlashgan Om qonunini.
 - B) Tok zichligi tushunshasini .
 - C) Joul-Lens qonuning differensial ko'rinishini.
 - D) Om qonuning differensial ko'rinshini .
 - E) Zanjirni bir qismi uchun Om qonunini

12. Bir jinsli o'tkazgichda tok zichligi j . O'tkazgich ko'ndalang kesimi yuzasi S orqali tok kuchini aniqlang:

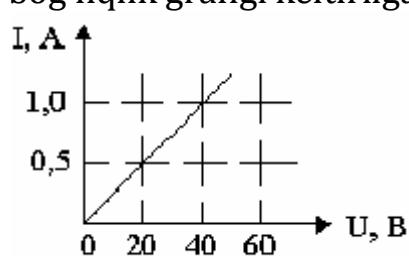
$$j = 2A/mm^2, S = 1sm^2$$

A) 20 A. B) 2 A. C) 200 A. D)
 0,02 A. E) 2 μ A.

13. O'kazgichning solishtirma qarshiligi deb nimaga aytildi?

- A) Zanjir qismidagi kuchlanishning tok kuchiga nisbatiga
- B) Zanjir qismidagi qarshilikka teskari bo'lган kattalikka
- C) Tok kuchini qarshilikka ko'paytmasiga.

16. Rasmda zanjirning bir jinsli qismidagi tok kuchining, qo'yilgan kuchlanishga bog'liqlik grafigi keltirilgan. Zanjir qismidagi qarshilik nimaga teng:



- A) 0,025 Ω . B) 40 Ω . C) 20 Ω . D) 60 Ω . E) 0,040 Ω .

- D) Ko'ndalang kesimining yuzasi $1m^2$, uzunligi 1m bo'lgan o'tkazgichning qarshiligiga
 E) Zanjir qismidagi solishtirma o'tkazuvchanlikka teskari bo'lgan kattalikka

14. Zanjir qismining solishtirma o'tkazuvchanligi nima?
- A) Zanjir qismidagi kuchlanishning tok kuchiga nisbati
 - B) Zanjir qismidagi qarshilikka teskari bo'lgan kattalik
 - C) Tok kuchini qarshilikka ko'paytmasi.
 - D) Ko'ndalang kesimining yuzasi $1m^2$, uzunligi 1m bo'lgan o'tkazgichning qarshiligi
 - E) Zanjir qismidagi solishtirma o'tkazuvchanlikka teskari bo'lgan kattalik
15. Uzluksizlik tenglamasini ko'rsating

A) $\oint j dS = \oint \frac{dq'}{dt} = -\oint \frac{dq}{dt}$

B) $\oint \vec{j} d\vec{S} = -\frac{dq}{dt}$

C) $I = \int_s \vec{j} d\vec{S} = \int_s j_n dS$

D) $I = \int_s \vec{j} d\vec{S} = \int_s j_n dS$

17. Agar o'tkazgicchning uchlariga 20 V potensiallar farqi qo'yilgan bo'lsa, qarshiligi 100 Ω bo'lgan o'tkazgichdan 1 s ichida qancha zaryad oqib o'tadi:

- A) 0,5 C B) 0,2 C C) 200 C D) 0,1 C E) 0,02 C

18. O'lchov birliklarini to'g'ri tanlang:

1. tok kuchi , 2.kuchlanish , 3.qarshilik, 4.tokning ishi

- | | | | |
|----------|--------|----------|----------|
| A) | B) | C) | D) |
| 1. Joul | 1Amper | 1. Volt | 1. Om |
| 2. Amper | 2.Volt | 2. Om | 2. Amper |
| 3. Volt | 3.0m | 3. Amper | 3. Joul |
| 4. Om | 4.Joul | 4. Joul | 4. Volt |

19.O'tkazgichning qashiligi nimaga bog'liq?

- A)O'kazgich materiali va temperaturasiga
B)Shakli, o'lchamlari va tashqi muhitning dielektrik singdiruvhanligiga
C)O'tkazgichning materiali, shakli, o'lchami va temperaturasiga
D)O'tkazgichning materialiga

- A) barcha qarshiliklarda tok kuchi bir xil
B) zanjir uchlaridagi kuchlanish tushishi alohida qismlardagi kuchlanishlarning yig'indisiga teng
C)umumiylar qarshilik alohida o'tkazgichlar qarshliklarining yig'indisiga teng .
D) umumiylar o'tkazuvchanlik alohida o'tkazgichlar o'tkazuvchanliklarining yig'indisiga teng.

20.Tok zichligi, potensiallar farqi, solishtirma qarshilik, solishtirma o'tkazuvchanlik va tok kuchini mos ravishda joylashish ketma-ketligini ko'rsating:

- A) $A; \quad V; \quad \Omega; \quad \frac{1}{\Omega}; \quad \Omega \cdot m$
B) $A; \quad V; \quad \Omega \cdot m; \quad \frac{A}{m^2}; \quad \Omega$
C) $\frac{A}{m^2}; \quad V; \quad \Omega \cdot m; \quad \frac{1}{\Omega \cdot m}; \quad A$
D) $\frac{A}{m^2}; \quad \Omega \cdot m; \quad V; \quad \frac{1}{\Omega}; \quad A$

21.Quyida keltirilgan tasdiqlardan qaysi biri o'rinli emas
O'tkazgichlarni ketma-ket ulaganda....

22.Joul-Lens qonunini differensial ko'rinishini ko'rsating.

- A) $Q = I^2 R t$ B) $w = \frac{E^2}{\rho}$
C) $j = nq_0 < v >$ D) $j = \sigma E$

23 Joul-Lens qonunini integral ko'rinishini ko'rsating.

- A) $Q = I^2 R t$ B) $w = \frac{E^2}{\rho}$
C) $j = nq_0 < v >$ D) $j = \sigma E$

24. $\omega = \gamma E^2$ tenglama nimani ifodalaydi:

- A) Om qonunini differensial ko'rinishini.
B) Joul-Lens qonunini integral ko'rinishini.

- C) Joul-Lens qonunini differensial ko'rinishini.
D) Umumlashgan Om qonunini.

25.Tugunlar uchun Kirxgof qoidasini aniqlang:

A) $\sum_i I_i R_i = \sum_k \mathcal{E}_k$

B) $I = \frac{\mathcal{E}}{r + R}$

C) $\sum_k I_k = 0$

D) $R = \sum_{i=1}^n R_i$

26.Kontur uchun Kirxgof qoidasini aniqlang:

A) $\sum_i I_i R_i = \sum_k \mathcal{E}_k$

B) $I = \frac{\mathcal{E}}{r + R}$

C) $\sum_k I_k = 0$

D) $R = \sum_{i=1}^n R_i$

27. Agar elektr zanjiridagi tashqi qarshilik tok manbaining ichki qarshiligidagi teng bo'lsa, tok manbaining FIK i necha foizga teng. .

- A) 25%. B) 35%. C) 40%. D) 75%.
E) 50%.

28. Agar teng tomonli uchburchakning har bir tomonlarining qarshiligi R ga teng bo'lsa, uning ikki uchlari orasidagi qarshilikni aniqlang.

- A) $R/2$. B) $3R/2$. C) $6R$. D) $2R/3$.
E) $3R$

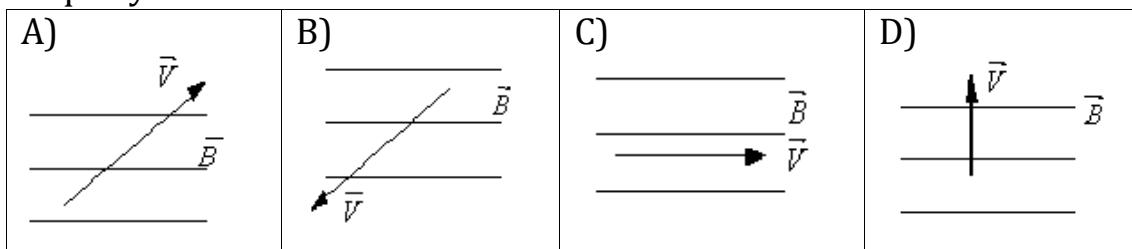
29.Tok kuchi $I = 20 + 4t$ qonun bo'yicha o'zgaradi.O'tkazgich orqali 2 sekundda qancha zaryad miqdori o'tadi.
A) 20 C. B) 4 C. C) 48 C. D) 24 C.
E) 28 C

30. Otkazgich bo'ylab o'tuvchi elektr zaryadi $q = 20 + 4t$ qonun bo'yicha o'zgaradi. O'tkazgichda 2 sekunddagi tok kuchi aniqlansin.

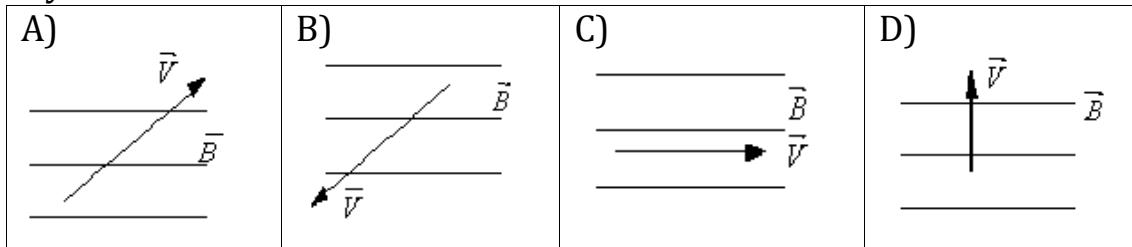
- A) 48A. B) 4A. C) 24. D) 20 A.
E) 28A

ELEKTROMAGNETIZM

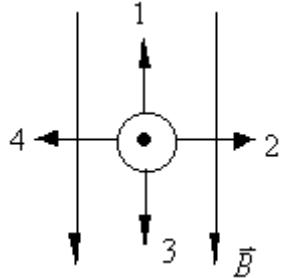
1.Keltirilgan holatlarning qaysi birida bir jinsli magnit maydoniga uchib kirgan proton to'g'ri chiziq bo'ylab harakatlanadi?



2. Keltirilgan holatlarning qaysi birida bir jinsli magnit maydoniga uchib kirgan proton aylana bo'ylab harakatlanadi?

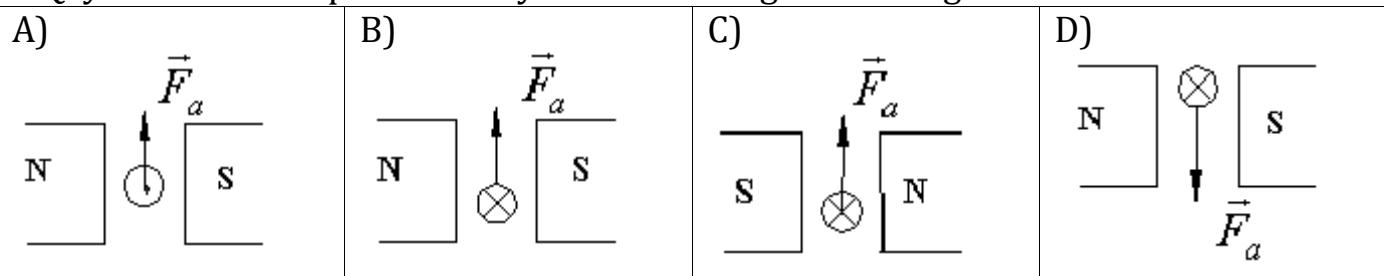


3.Rasmda, magnit maydonida joylashtirilgan, magnit induksiyasi \mathbf{B} bo'lgan tokli o'tkazgich ko'rsatilgan. Amper kuchini yo'nalishini aniqlang.



- A) 1 и 2 B) 3 C) 4 D) 1 E) 2

4.Qaysi holatda Amper kuchini yo'nalishi noto'gri ko'rsatilgan?



5. $I=5$ A tok o'tayotgan, radiusi $R=5$ sm bo'lgan yupqa halqaning markazida magnit maydon induksiyasi B nimaga teng?

- A) $20 \mu\text{T}$ B) 0 T
C) 50 T D) $62,8 \mu\text{T}$

6. 4 s ichida kontur orqali magnit oqimi 10 Wb dan 2 Wb gacha bir tekis kamayadi. Konturdagi induksiya E.Yu.K ining qiymati nimaga teng bo'lgan?
A) 5 V B) 2 V
C) 20 V D) 12 V
E) 15 V

7.Agar maydon induksiyasini 2 marta kamaytirilsa, bir jinsli magnit maydonida elektron chizgan aylana radiusi qanday o'zgaradi?

- A) 2 marta ortadi
B) 2 marta kamayadi
C) 4 marta kamayadi
D) 4 marta ortadi
E) O'zgarmaydi

8.Zaryadlangan zarracha bir jinsli magnit maydon kuch chiziqlariga perpendikulyar ravishda \mathbf{v} tezlik bilan harakatlanmoqda. Agar tezlikni 2 marta orttirilsa, zarrachaning aylanish davri qanday o'zgaradi?

- A) 4 marta ortadi
B) 4 marta kaamyadi
C) 2 marta kamayadi
D) O'zgarmaydi
E) 2 marta ortadi

9.Tok kuchi 10 A bo'lganda, induktivligi $0,2 \text{ mH}$ li konturda qanday magnit oqimi vujudga keladi?

- A) 50 Wb B) 2 Wb
C) 2 mWb D) 50 mWb
E) $0,02 \text{ mWb}$

10. Induktivligi 2 H bo'lgan konturda, tok kuchining qanday qiymatida kontur orqali magnit oqimi 4 Wb ga teng bo'ladi?

11. Bir jinsli magnit maydoniga α burchak ostida, o'zgarmas tezlik bilan uchib kirgan proton kuch chizqlari yo'nalishiga nisbatan qanday traektoriya bo'yicha harakatlanadi ?

- A) To'gri chiziq bo'ylab
Ellips bo'ylab
C) Aylana bo'ylab
D) Vintsimon chiziq bo'ylab
E) Yoy bo'ylab

12. Bir jinsli magnit maydoniga α burchak ostida, o'zgarmas tezlik bilan

14. Agarda birinchi o'tkazgichdagi tok kuchi ikkinchisiga nisbatan 2 marta katta bo'lsa, rasmda ko'rsatilgan C nuqtadagi yo'nalishlarning qaysi biri ikkita parallel cheksiz uzun tokli o'tkazgichning magnit maydon induksiyasi vektori yo'nalishiga mos keladi?

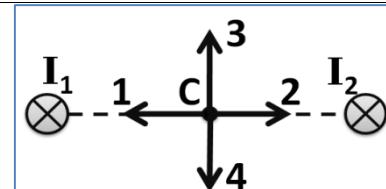
- A) 4 B) 1 C) 2 D) 3
E) B=0 bo'lgani uchun, keltirilgan yo'nalishlarning hech qaysi o'rinli emas

uchib kirgan proton kuch chizqlari
yo'nalishiga perpendikulyar ravishda
qanday traektoriya bo'yicha
harakatlanadi?

- A) To'gri chiziq bo'ylab
 - B) Ellips bo'ylab
 - C) Aylana bo'ylab
 - D) Vintsimon chiziq bo'ylab
 - E) Yoy bo'ylab

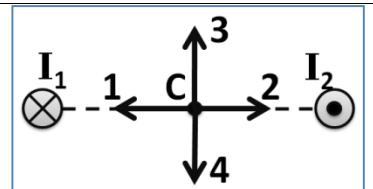
13. Bir jinsli magnit maydoniga α burchak ostida, o'zgarmas tezlik bilan uchib kirgan proton kuch chizqlari yo'nalishiga parallel ravishda qanday traektoriya bo'yicha harakatlanadi?

- A) To'gri chiziq bo'ylab
 - B) Ellips bo'ylab
 - C) Aylana bo'ylab
 - D) Vintsimon chiziq bo'ylab
 - E) Yoy bo'ylab



15. Agarda birinchi o'tkazgichdagi tok kuchi ikkinchisiga nisbatan 2 marta katta bo'lsa, rasmda ko'rsatilgan C nuqtadagi yo'nalishlarning qaysi biri ikkita parallel cheksiz uzun tokli o'tkazgichning magnit maydon induksiyasi vektori yo'nalishiga mos keladi?

- A) 4 B) 1 C) 2 D) 3
E) B=0 bo'lgani uchun, keltirilgan yo'nalishlarning hech qaysi o'rini emas



16. Magnit maydonni qaysi xususiyati Gauss teoremasini ifodalaydi ... $\oint_S \vec{B} dS = 0$

- A) Superpozitsiya prinsipi
- B) Maydon manbasi bo'lgan magnit zaryadlarining yo'qligi
- C) Maydonni vujudga kelishiga sababchi - toklar
- D) Maydonni uyurmali va kuch xarakteriga egaligi
- E) Maydonni kuch xarakteri

17. Induksiya E.Yu.K. ining formulasini ko'rsating ?

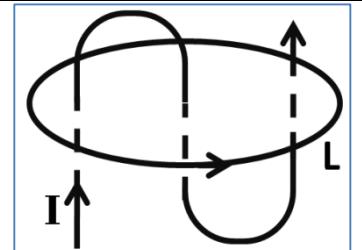
- | | | |
|----------------------------------|-----------------------------------|--------------------------------------|
| A) $W = \frac{LI^2}{2}$ | B) $\Phi = BS \cos \alpha$ | |
| C) $\varepsilon = \frac{A}{q_0}$ | D) $\varepsilon = -\frac{dL}{dt}$ | E) $\varepsilon = -\frac{d\Phi}{dt}$ |

18. O'zinduksiya E.Yu.K. ining formulasini ko'rsating ?

- | | | |
|----------------------------------|-----------------------------------|--------------------------------------|
| A) $W = \frac{LI^2}{2}$ | B) $\Phi = BS \cos \alpha$ | |
| C) $\varepsilon = \frac{A}{q_0}$ | D) $\varepsilon = -\frac{dL}{dt}$ | E) $\varepsilon = -\frac{d\Phi}{dt}$ |

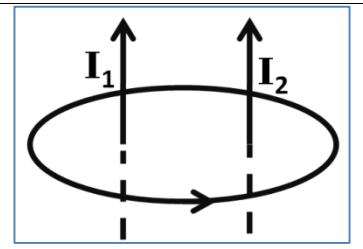
19. Rasmda ko'rsatilgan L kontur uchun elektrostatik maydon kuchlanganligi vektori tsirkulyatsiyasini navbatdag'i tokli o'tkazgich konfiguratsiyasi uchun aniglang: $\oint_L \vec{B} d\vec{l}$

- A) $2\mu_0 I$ B) $3\mu_0 I$ C) $\mu_0 I$ D) $-2\mu_0 I$



20. Rasmda ko'rsatilgan L kontur uchun elektrostatik maydon kuchlanganligi vektori tsirkulyatsiyasini navbatdag'i tokli o'tkazgich konfiguratsiyasi uchun aniglang: $\oint_L \vec{B} d\vec{l}$

- A) $\mu_0(I_1 + I_2)$ B) $\mu_0(I_1 - I_2)$
C) 0 D) $\mu_0 I_1 I_2$

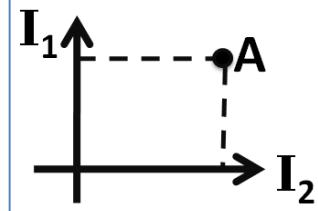


21. Bir jinsli magnit maydonida joylashgan 100 sm^2 yuzali kontur orqali magnit oqimi $8 \cdot 10^{-2} \text{ Wb}$ ga teng. Agar kontur maydonga perpendikulyar joylashsa, magnit maydon induksiyasi nimaga teng ?

- A) 80 T B) 0,125 T
C) 800 T D) 8 T E) $8 \cdot 10^{-4} \text{ T}$

22. A nuqtada ikkita cheksiz uzun tokl o'tkazgichlarning magnit maydon induksiyasi nimaga teng?

- A) $B = B_1 + B_2$ B) $B = \sqrt{B_1^2 + B_2^2}$
 C) $B = B_1 - B_2$ D) $B = \sqrt{B_1^2 - B_2^2}$
 E) $B = \sqrt{B_1^2 + B_2^2 - 2B_1 B_2 \sin \alpha}$



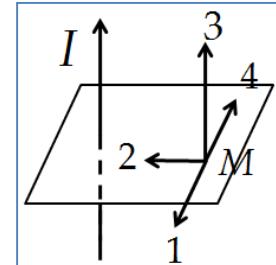
23.Qanday magnit maydoni bir jinsli hisoblanadi?

- A) Magnit maydonning har bir nuqtasida magnit induksia vektori kattaligi va yo'nalishi o'zgarmas
 B) Magnit maydon induksiya vektori kattaligi vaqt o'tishi bilan o'zgarmaydi
 C) Magnit maydon kuch chiziqlari bir-biriga parallel
 D) Maydonning magnit induksiya vektori vaqt bo'yicha o'zgarmas
 E) Magnit induksiya vektorining moduli vaqt o'tishi bilan o'zgaradi

24.Induktivligi $L=1H$ bo'lgan o'tkazgichli konturda tok $I = 4 - 15t$ (A) qonun bo'yicha o'zgarmoqda. Konturda vujudga kelgan o'zinduksiya E.Yu.K. i nimaga teng bo'ladi.

- A) -15 V B) 4 V
 C) 15 V D) -4 V
 E) 11 V

25. Uzun to'g'ri o'tkazgichdan I tok oqmoqda. M nuqtada magnit maydon induksiya vektori qanday yo'nalishga ega?



- A) 4 B) 1 C) 2 D) 3

26.Transformator – bu ... qurilma.

- A) tok va kuchlanishni o'zgartiruvchi
 B) zaryadlangan zarrachalarni tezlashtiruvchi
 C) izotoplarni bo'linishini ta'minlovchi
 D) radioaktiv nurlarni aniqlovchi
 E) o'zgaruvchan tokni to'g'rilib beruvchi

kamaydi.Bu paytda konturda induksiya E.Yu.K nimaga teng?

- A) 4 V B) 18 V
 C) 2 V D) 3 V
 E) 1 V

27.Kontur bilan cheklangan magnit oqimi 3 s da 9 Wb dan 3 Wb gacha

28.Tokning o'zgarmas qiymatida, konturdagi magnit maydon energiyasini 4 marta kamaytirish uchun kontur induktivligini qanday o'zgartirish kerak.
 A) 2 marta oshirish

- B) 2 marta kamaytirish
- C) 8 marta kamaytirish
- D) 16 marta kamaytirish
- E) 4 marta kamaytirish

29. Kontur bilan cheklangan magnit oqimi 2 s da 2 Wb dan 8Wb gacha bir tekis ortib bordi. Konturdagi induksiya E.Yu.K nimaga teng bo'lgan?

- A) 3 V
- B) 5 V
- C) 20 V
- D) 12 V
- E) 0 V

30. Kontur bilan cheklangan magnit oqimi 3 s da 3 Wb dan 9 Wb gacha ortdi.Bu paytda konturda induksiya E.Yu.K nimaga teng?

- A) 6 V
- B) 1 V
- C) 3 V
- D) 2 V
- E) 18 V

31. Kontur bilan cheklangan magnit oqimi 2 s da 8 Wb dan 2Wb gacha bir tekis kamaydi. Konturdagi induksiya E.Yu.K nimaga teng bo'lgan?

- A) 2 V
- B) 1 V
- C) 3
- D) 6 V
- E) 18 V

32.Quyida keltirilgan kattaliklardan qaysi biri o'lchamga ega emas?

- A) Moddaning magnit singdiruvchanligi
- B) Tok zichligi
- C) Solishtirma qarshilik
- D) Elektr zaryadining sirt zichligi
- E) XBT tizimida elektr doimiysi

- 33.G'altak induktivligi nimaga bog'liq emasligini ko'rsating:
- A) O'ramlar soniga
 - B) G'altak shakliga
 - C) O'zak materialiga
 - D) G'altak simining materialiga

34.Qaysi kattalik magnit maydonning kuch xarakteristikasi hisoblanadi:

- A) Amper kuchi
- B) Magnit momenti .
- C) Magnit induksiya vektori .
- D) Lorens kuchi
- E) Magnit oqimi .

35.Modda magnit singdiruvchanligining qaysi qiymatlari ferromagnetiklarga mos keladi:

- A) $\mu \gg 1$
- B) $\mu \geq 1$
- C) $\mu \leq 1$
- D) $\mu = 1$
- E) $\mu \ll 1$

36. Qanday moddalar tashqi magnit maydonida, uning yo'naliishiqa qarama-qarshi magnitlanadi.

- A) Ferrimagnetiklar
- B) Ferromagnetiklar
- C) Paramagnetiklar
- D) Diamagnetiklar
- E) Segnetoelektriklar

- 37.Keltirilgan formulalar orasidan magnit maydonida tokli o'tkazgichga ta'sir etuvchi Amper kuchini toping.
- 1. $F = q \mathcal{B} \sin \alpha$
 - 2. $F = I \ell B \sin \alpha$
 - 3. $F = qE$
 - 4. $dF = I [\vec{d\ell} \vec{B}]$
 - A) 2,3 B) 1
 - C) 2,4 D) 3

38.Keltirilgan tenglamalar orasidan Lorens kuchini toping.

1. $F = IB\ell \sin \alpha$ 2. $F = q\mathcal{B}B \sin \alpha$
 3. $F = qE$ 4. $\vec{F} = q[\vec{\mathcal{B}}\vec{B}]$

- A) 2,3 B) 1,2
 C) 1,3 D) 2,4

39.Lorens kuchi ega bo'lмаган xususiyatni ko'rsating.

- A) Tezlanish beradi.
 B) Ish bajaradi.
 C) Tezlik vektori yo'nalishini o'zgartiradi.
 D) Traektoriyani o'zgartiradi.

40.Elektr toklari bir xil yo'nalishga ega bo'lgan ikkita parallel o'tkazgich o'zaro qanday ta'sirlashadi?

- A) O'zaro ta'sir kuchi nolga teng
 B) O'tkazgichlar tortishadi
 C) O'tkazgichlar itarishadi
 D) Ikkala o'tkazgich bir xil yo'nalishda egiladi.

41.Quyidagi ifogalardan qausi biri Bio-Savar-Laplas qonunini ifodalaydi?

$$A) d\vec{B} = \frac{\mu\mu_0}{4\pi} \frac{I[d\vec{r}]}{r^3} \quad B) \vec{B} = \mu\mu_0 \vec{H}$$

$$B = \frac{\mu\mu_0}{2} \frac{IR^2}{(\sqrt{R^2 + r^2})^3} \quad D)$$

$$C) \vec{B} = \left(\frac{\mu\mu_0}{4\pi} \right) \frac{q[\vec{v}\vec{r}]}{r^3}$$

$$D) \vec{B} = \left(\frac{\mu\mu_0}{4\pi} \right) \frac{q[\vec{v}\vec{r}]}{r^3}$$

42.Magnit oqimi o'lchov birligini aniqlang.

- A) T
 B) H
 C) Wb
 D) A/m

43.Magnit induksiyasi o'lchov birligini aniqlang.

- A) T
 B) H
 C) Wb
 D) A/m

44.Quyida keltirilgan formulalardan solenoid ichida hosil bo'ladigan magnit maydon kuchlanganligini aniqlang.

A) $H = nI$

B) $H = nI \frac{r}{R}$

C) $H = \frac{I}{2r}$

D) To'g'ri javob yo'q

45. Magnit maydoni o'zining xusiyatlariiga ko'ra, qanday maydon hisoblanadi?

- A) Uyurmali maydon
 B) Potensial maydon
 C) Nokonservativ maydon
 D) To'g'ri javob yo'q

46.Solenoid induktivligiga tegishli formulani toping.

A) $L = \mu\mu_0 \frac{N^2}{\ell} S$ B) $L = \varphi / J$

C) $L = \psi / J$ D) $L = \mu\mu_0 n^2 S$

47.Aylanma tok markazida hosil bo'ladigan magnit maydonning induksiyasini aniqlang:

A) $B = \frac{\mu\mu_0 I}{2\pi R}$ B) $B = \frac{\mu\mu_0 I}{4\pi R}$

$$C) B = \frac{\mu\mu_0}{2} \frac{IR^2}{\left(\sqrt{R^2 + r^2}\right)^3} \quad D)$$

$$B = \frac{\mu\mu_0 I}{2R}$$

48. Magnit induksiya vektori uchun Gauss teoremasini aniqlang:

- A) $\oint B_n dS = 0$ B) $\oint B_l dl = 0$
 C) $\oint B_l dl = \mu_0 \sum I_i$ D) $\oint B_n dS = \frac{1}{\epsilon_0} \sum q_i$

49. To'g'ri tasdiqni toping.

A) Tokli yopiq konturni magnit maydonida ko'chirishda bajarilgan ish konturdagi tok kuchining kontur bilan o'rallan sirt orqali magnit oqimining o'zgarishiga (yoki uning oqim tutilishiga) ko'paytmasiga teng.

B) Tokli yopiq konturni magnit maydonida ko'chirishda bajarilgan ish, o'tkazgichga ta'sir etuvchi kuchning, uning ko'chishiga ko'paytmasiga teng.

C) Tokli yopiq konturni magnit maydonida ko'chirishda bajarilgan ish nolga teng..

D) Bajarilgan ish magnit doimiysi va toklarning algebraik yig'indisiga teng .

50. Ushbu tenglamalardan qaysilari, zanjir ulanganda va uzilgandagi ekstratoklarning formulalari hisoblanadi?

$$A) I = \frac{dq}{dt} \quad B) I = jS \\ C) I = I_0 \left(1 - e^{-\frac{R}{L}t}\right) \quad I = I_0 e^{-\frac{R}{L}t}$$

$$D) I = \frac{U}{R} \quad I = \frac{\varphi_1 - \varphi_2 + \mathcal{E}_{12}}{R}$$

51. To'liq tok qonuniga ta'rif bering?
 A) Tugunda uchrashgan toklarning algebraik yig'indisi nolga teng.

B) Elektr zanjiridagi tok kuchi konturdagi E.Yu.K.ga to'g'ri proporsional, qarshilikka esa teskari proporsional.

C) Magnit maydon kuchlanganligi vektorining ixtiyoriy yopiq kontur bo'y lab tsirkulyatsiyasi, kontur sirti orqali o'tuvchi toklarning yig'indisiga teng.,

$$\oint H dl = \sum I_i$$

D) To'g'ri javob yo'q

52. Moddaning magnitlanganligi nima ?

A) Magnitlanganlik J- modda birlik hajmining magnit momenti.

B) Magnitlanganlik, o'lchovsiz kattalik bo'lib, makrotoklar magnit maydonining (H) muhit mikrotoklari hisobiga hecha marta kuchayishini ko'rsatadi.

C) Doimiy magnitlarning magnitlanganligi - bu ularda mikrotoklar mavjudligi natijasidir.

D) Magnitlanganlik - bu atomning xysisyi magnit momenti \vec{p}_m .

53. Qanday moddalar diamagnetiklar deyiladi ?

A) Tashqi magnit maydon bo'limganda atom, molekula va ionlarning magnit momentlari nolga teng.

B) Tashqi magnit maydon bo'limganda atom, molekula va ionlarning magnit momentlari nogdan farqli.

C) Bular shunday moddalarki, ularda \vec{B} ning \vec{H} ga bog'lanishi chiziqli xarakterga ega emas.

D) To'g'ri javob yo'q.

54. Gisterezis hodisasi qanday magnetiklar uchun xarakterli?

A) Paramagnetiklar .

- B) Diamagnetiklar
 C) Ferromagnetiklar.
 D) O'tadiamagnetiklar.

55. Qanday hodisa o'zinduksiya hodisasi deyiladi?

- A) O'zgaruvchan tok zanjiri yaqinidagi o'tkazgichlarda induksiya E.Yu.K. ining hosil bo'lishi;
 B) Elektr zanjirida, undagi elektr tokini o'zgarishi natijasida elekrtomagnit induksiya E.Yu.K. ini hosil bo'lishi;
 C) Qutblangan dielektriklar qutblanishini o'zgarishi vaqtida, issiqlik yutilish yoki ajralish hodisasi;
 D) Tashqi maydonni har qanday o'zgarishi natijasida induksion tokni hosil bo'lishi.

56. Elektromagnit induksiyaning elektr yurituvch kuchi nimaga bog'liq?

- A) Konturning shakli va o'lchamiga
 B) Tok kuchining o'zgarish tezligiga
 C) Konturga tortilgan sirt orqali magnit oqimining o'zgarish tezligiga
 D) To'g'ri javob yo'q

57. Magnit maydonida harakatlanayotgan kontur uchun elektromagnit induksiya E.Yu.K. ining ifodasini ko'rsating:

$$A) \varepsilon = -\frac{d\Phi}{dt} \quad B) \varepsilon = -L \frac{dI}{dt} \quad C) \varepsilon = Blvsina\alpha \quad D) \varepsilon = IR$$

58. Elektromagnit induksiya qonunini ko'rsating (Faragey qonuni):

$$A) \varepsilon = -\frac{d\Phi}{dt} \quad B) \varepsilon = -L \frac{dI}{dt} \quad C) \varepsilon = Blvsina\alpha \quad D) \varepsilon = IR$$

59. Magnit maydon energiyasi va magnit maydon energiya zichligi uchun ifodalarni aniqlang.

$$1. W = qu \quad 2. W = \frac{LI^2}{2}$$

$$3. W = I^2 Rt \quad 4. \omega = \frac{\mu\mu_0 H^2}{2} \quad 5. \omega = \frac{\mu\mu_0 E^2}{2} \quad 6. \omega = \frac{ED}{2};$$

$$7. W = \frac{\Phi^2}{2L} \quad 8. W = \frac{I\Phi}{2} \quad 9. \omega = \frac{HB}{2} \quad 10. \omega = \frac{D^2}{2\varepsilon\varepsilon_0}$$

- A) 1,2,3,4
 B) 2,4,7,8
 C) 10,7,8,5
 D) 3,4,9,8

60. Magnit induksiya vektori uchun Gauss teoremasini aniqlang:

$$A) \oint B_n dS = 0 \quad B) \oint B_l dl = 0 \quad C) \oint B_l dl = \mu_0 \sum I_i \quad D) \oint B_n dS = \frac{1}{\varepsilon_0} \sum q_i$$

61. Quyida keltirilgan formulalardan qaysi biri harakatlanayotgan zaryadning magnit maydonini aniqlab beradi?

$$A) d\vec{B} = \frac{\mu\mu_0}{4\pi} \frac{I[\vec{dl}\vec{r}]}{r^3} \quad B) \vec{B} = \mu\mu_0 \vec{H}$$

$$B) \vec{B} = \frac{\mu\mu_0}{2} \frac{IR^2}{(\sqrt{R^2 + r^2})^3}$$

$$C) \vec{B} = \left(\frac{\mu\mu_0}{4\pi} \right) \frac{q[\vec{vr}]}{r^3}$$

62. Magnit induksiya vektori tsirkulyatsiyasi haqidagi teoremaning formulasini ko'rsating:

A) $\oint B_n dS = 0$ B) $\oint B_l dl = 0$

C) $\oint B_l dl = \mu_0 \sum I_i$

D)

$\oint B_n dS = \frac{1}{\epsilon_0} \sum q_i$

MEXANIK TEBRANISHLAR

1. Nuqta x o'qi bo'ylab

$$x = 0,1 \cos(2\pi t - \frac{\pi}{4})$$

qonun bilan

tebranmoqda. Tebranishlar amplitudasini toping:

- | | |
|--------------------|--------|
| A) $\frac{\pi}{4}$ | B) 1m |
| C) 2π m | D) π m |
| E) 0,1 m | |

2. Amplitudasi 5 sm, davri 4 s,

boshlang'ich fazasi $\frac{\pi}{4}$ rad. ga teng

bo'lgan garmonik tebranishlar tenglamasini yozing::

A) $x = 0,05 \sin(\frac{\pi}{2}t + 0,5) m$

B) $x = 5 \sin(\frac{\pi}{2}t + \frac{\pi}{4}) m$

C) $x = 4 \sin(\frac{\pi}{4}t + 0,05) i$

D) $x = 0,05 \sin(\frac{\pi}{4}t + \frac{\pi}{2}) i$

E) $x = 0,05 \sin \frac{\pi}{4}(t+1) i$

3. Moddiy nuqta $x = 0,5 \sin \pi(t + 0,2) i$ qonun bo'yicha tebranmoqda. Tebranishlar davrini toping ?

- A) 3,14s
B) 0,5 s
C) 2 s

D) 0,2 s

E) 4 s

4. Agar yukning massasi 2 marta orttirilsa, matematik mayatnikning xususiy tebranishlar davri qanday o'zgaradi?

- A) 2 marta kamayadi
B) 4 marta kamayadi
C) 4 marta ortadi
D) 2 marta ortad
E) o'zgarmaydi

5. Moddiy nuqta $x = 0,5 \sin \pi(t + 0,2) i$ qonun bo'yicha tebranmoqda . Tebranishlarning boshlang'ich fazasi topilsin?

- | | | |
|----------|--------------------|--------------------|
| A) 0,2 | B) 0,5 | C) $\frac{\pi}{5}$ |
| D) π | E) $\frac{\pi}{2}$ | |

6. Tebranayotgan jismning massasi 4 marta orttirilsa, prujinali mayatnkning xususiy tebranishlar davri qanday o'zgaradi?

- A) 4 marta ortadi
B) 2 marta ortadi
C) 2 marta kamayadi
D) 4 marta kamayadi

E) O'zgarmaydi

7. Erkin tebranishlar deb qanday tebranishlarga aytiladi?

A) Agar jism dastlab olgan energiya hisobiga tebranib, tebranish tizimiga tashqi ta'sir bo'limganda ham davom etadigan tebranishlar.

B) Agar ular davriy ravishda o'zgaruvchi tashqi kuch ta'sirida amalga oshirilsa .

C) Agar tebranayotgan fizik kattalik sinus(yoki kosinus) qonuni bo'yicha o'zgarsa.

D) Agar tebranishlar vaqt o'tishi bilan so'nuvchan bo'lса.

8.To'g'ri tasdiqni toping:

A) Tezlik fazasi ko'chish fazasidan π

ga, tezlanish fazasi esa $\frac{\pi}{2}$ ga farq qiladi.

B) Tezlik va tezlanish fazasi ko'chish fazasidan $\frac{\pi}{2}$ ga farq qiladi.

C) Tezlik fazasi ko'chish fazasidan $\frac{\pi}{2}$ ga, tezlanish fazasi esa π ga farq qiladi.

D) Tezlik va tezlanish fazasi ko'chish fazasidan π ga farq qiladi

9.Prujinali, fizik va matematik mayatniklarning tebranish davrlari formulalarini ko'rsating:

$$1. T = 2\pi \sqrt{\frac{m}{k}} \quad 2. T = \frac{t}{N} \quad 3. T = 2\pi \sqrt{\frac{I}{mgl}}$$

$$4. T = \frac{2\pi}{\omega} \quad 5. T = \frac{1}{\nu} \quad 6. T = 2\pi \sqrt{\frac{l}{g}}$$

A) 1,2,4 B) 1,3,6

C) 2,3,5 D) 2,4,6

10.So'nuvchi tebranishlar relaksatsiya vaqtiga teskari bo'lgan fizik kattalik qanday ataladi?

A) So'nish xarakteristikasi

B) Chastota

C) So'nish koefisienti

D) So'nishning logarifmik dekrementi

11.Prujinali mayatnikning erkin tebranishlar differensial tenglamasini ko'rsating

$$A) \ddot{x} + \frac{r}{m} \dot{x} + \frac{k}{m} x = 0$$

$$B) \ddot{x} + \frac{k}{m} x = 0$$

$$C) \ddot{x} + \frac{g}{l} x = 0 \quad D) \ddot{q} + \frac{R}{L} \dot{q} + \frac{1}{LC} q = 0$$

12.Matematik mayatnikning erkin tebranishlar differensial tenglamasini ko'rsating

$$A) \ddot{x} + \frac{r}{m} \dot{x} + \frac{k}{m} x = 0$$

$$B) \ddot{x} + \frac{k}{m} x = 0$$

$$C) \ddot{x} + \frac{g}{l} x = 0 \quad D) \ddot{q} + \frac{R}{L} \dot{q} + \frac{1}{LC} q = 0$$

13.Prujinali mayatnikning so'nuvchi tebranishlar differensial tenglamasini ko'rsating

$$A) \ddot{x} + \frac{r}{m} \dot{x} + \frac{k}{m} x = 0$$

$$B) \ddot{x} + \frac{k}{m} x = 0$$

$$C) \ddot{x} + \frac{g}{l} x = 0 \quad D) \ddot{q} + \frac{R}{L} \dot{q} + \frac{1}{LC} q = 0$$

14.So'nuvchi mexanik tebranishlar tengamasini ko'rsating

$$A) x = A \cos(\omega t + \varphi)$$

$$B) x = e^{-\delta t} \cos(\omega t + \varphi)$$

$$C) x = A_0 e^{-\delta t} \cos(\omega t + \varphi)$$

$$D) x = A \sin(\omega t + \varphi)$$

15.Mexanik rezonans deb nimaga aytildi?

Rezonans- bu ...

A) majbur etuvchi kuch chastotasining ma'lum bir qiymatida majburiy tebranishlar amplitudasining keskin oshib ketishi.

- B) majburiy tebranishlar amplitudasining tashqi kuch amplitudasi va chastotasiga bog'liqligi
 C) tok chastotasining torning ma'lum bir garmonikasi chastotasi bilan mos kelishi.
 D) majbur etuvchi kuch chastotasi tizimning xususiy chastotasiga yaqinlashganda tebranishlar amplitudasining keskin oshib ketishi

16.Tepki tenglamasi, tepki amplitudasi va tepki siklik chastotasini ko'rsating :

$$1. x = 2A \cos \frac{\Delta\omega}{2} t \sin(\omega t + \varphi_0) \quad 2.$$

$$x = A \sin(\omega t + \varphi_0)$$

$$3. x = A \sin 2\pi\nu t \quad 4. x = A \sin\left(\frac{2\pi}{T}t + \varphi_0\right)$$

$$5. A_T = 2A \cos \frac{\omega_0 - \omega_1}{2} \quad 6. \omega = \frac{\omega_0 - \omega_t}{2}$$

- A) 1,5,6 B) 2,4,5
 C) 1,2,4 D) 2,3,5

18.Moddiy nuqta

$x = 0,5 \sin \pi(t + 0,2)$ i qonun bo'yicha tebranmoqda. Tebranishlarning siklik chastotasini toping?

- A) 0,2 rad/s B) 1 rad/s

$$C) \frac{\pi}{5} \text{ rad/s} \quad D) \pi \text{ rad/s}$$

$$E) \frac{\pi}{2} \text{ rad/s}$$

ELEKTROMAGNIT TEBRANISHLAR

1.Tebranish konturida elektr tebranishlari $q = 10^{-2} \cos 20t$ tenglama bilan berilgan. Zaryadning tebranish amplitudasi nimaga teng?
 A) 10^{-2} C
 B) 20 C

- C) $\cos 20t \text{ C}$
 D) $20t \text{ C}$

2. Tebranish konturida kondensatordagi zaryadning boshlang'ich qiymati o'zgartirildi. Konturda vujudga keladigan elektr tebranishlarining qaysi xarakteristikalari o'zgarmasdan qoladi?

- A) Tok kuchining tebranishlar amplitudasi
 B) Tebranishlar davri
 C) Kondensatordag kuchlanish amplitudasi
 D) G'altak maydonining magnit induksiya amplitudasi
 E) To'g'ri javob yo'q

3.Ideal tebranish konturida xysusiy garmonik tebranishlar davrining formulasini aniqlang

$$A) T = 2\pi \sqrt{\frac{k}{m}} \quad B) T = 2\pi \sqrt{\frac{I}{mgl}}$$

$$C) T = 2\pi \sqrt{\frac{l}{g}} \quad D) T = 2\pi \sqrt{LC}$$

4. Tebranish konturida elektr tebranishlari $q = 10^{-2} \cos 20t$ tenglama bilan berilgan. Zaryadning tebranish amplitudasi nimaga teng?

- A) 10^{-2} C
 B) 20 C
 C) $20 \cdot 10^{-2} \text{ C}$
 D) $20t \text{ C}$
 E) $\sin 20t \text{ C}$

5. O'zgaruvchan tok zahirida kondensator zaryadi $q = 44 \cdot 10^{-4} \cos \omega t$ qonun bo'yicha o'zgarmoqda. Kuchlanish $U_m = 220 \text{ V}$. Kondensator sig'imi nimaga teng ?

- A) $2 \mu\text{F}$
 B) $44 \mu\text{F}$
 C) $20 \mu\text{F}$
 D) $4,4 \mu\text{F}$

E) $22 \mu\text{F}$

6.Zaryad $q = q_0 \cos(\omega t + \alpha)$ qonun bo'yicha o'zgarmoqda.Bu zanjirdagi tokning o'zgarish qonuni qanday bo'ladi?

A) $I = q_0 \omega \cos(\omega t + \alpha)$

B) $I = q_0 t \cos(\omega t + \alpha)$

C) $I = -q_0 \omega \sin(\omega t + \alpha)$

D) $I = q_0 \cos(\omega t + \alpha) / t$

E) $I = q_0 \omega \sin(\omega t + \alpha)$

7.Sig'im qarshilikning formulasini aniqlang :

A) $X_L = \omega L$

B) $X_C = \omega C$

C) $X_C = \frac{1}{\omega C}$

D) $X_C = \frac{1}{\omega L}$

E) $L = \frac{\hat{O}}{I}$

8.Agar g'altak induktivligi 4 marta orttirilsa, tebranish konturida erkin tebranishlar davri qanday o'zgaradi?

A) 4 marta kamayadi

B) 4 marta ortadi

C) 2 marta ortadi

D) O'zgarmaydi

E) 2 marta kamayadi

9.Konturdagi tebranishlarning xususiy chastotasini aniqlash formulasini toping

A) $\omega = 2\pi\sqrt{LC}$

B) $\omega = \frac{2\pi}{\sqrt{LC}}$

C) $\omega = \sqrt{LC}$

D) $\omega = \frac{1}{\sqrt{LC}}$

E) $\omega = \sqrt{\frac{g}{l}}$

10.Tebranish konturida elektr tebranishlari

$q = 10^{-2} \cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$ tenglama bilan berilgan. Zaryadning tebranishlar amplitudasi nimaga teng bo'ladi (Kl)?

A) $\frac{\pi}{2}$

B) $\frac{3\pi}{2}t + \frac{\pi}{2}$

C) $\frac{3\pi}{2}t$

D) 10^{-2}

E) $\cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$

11. Tebranish konturida elektr tebranishlari

$q = 10^{-2} \cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$ tenglama

bilan berilgan. Tok kuchining tebranishlar amplitudasi nimaga teng bo'ladi (A)?

A) $\frac{\pi}{2} \cdot 10^{-2}$

B)

$\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right) \cdot 10^{-2}$

C) $\frac{3\pi}{2}t \cdot 10^{-2}$

D) 10^{-2}

E) $\frac{3\pi}{2} \cdot 10^{-2}$

12. Tebranish konturida elektr tebranishlari

$q = 10^{-2} \cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$ tenglama

bilan berilgan. Tebranishlar fazasi nimaga teng bo'ladi?

A) $\frac{\pi}{2}$

B) $\frac{3\pi}{2}t + \frac{\pi}{2}$

C) $\frac{3\pi}{2}t$

D) 10^{-2}

E) $\cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$

13. Tebranish konturida elektr tebranishlari

$$q = 10^{-2} \cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right) \text{ tenglama}$$

bilan berilgan. Tebranishlar boshlang'ich fazasi nimaga teng bo'ladi?

- A) $\frac{\pi}{2}$ B) $\frac{3\pi}{2}t + \frac{\pi}{2}$
 C) $\frac{3\pi}{2}t$ D) 10^{-2} E)
 $\cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right)$

14.-----

15. Tebranish konturida elektr tebranishlari

$$q = 10^{-2} \cos\left(\frac{3\pi}{2}t + \frac{\pi}{2}\right) \text{ tenglama}$$

bilan berilgan. Tebranishlar davri nimaga teng bo'ladi (s)?

- A) $\frac{4}{3}$ B) $\frac{3\pi}{2}$
 C) $\frac{3\pi}{4}$ D) $\frac{2\pi}{3}$ E)
 $\frac{3}{2}$

16. Majburiy elektromagnit tebranishlar differensial tenglamasini ko'rsating:

$$A) \ddot{q} + \frac{R}{L}\dot{q} + \frac{1}{LC}q = 0 \quad B)$$

$$B) \ddot{q} + \frac{R}{L}\dot{q} + \frac{1}{LC}q = \frac{U_m}{L} \cos \omega t$$

$$C) \ddot{q} + \frac{1}{LC}q = 0 \quad D)$$

$$D) \ddot{q} + \frac{R}{L}\dot{q} + \frac{1}{LC}q = \frac{U_m}{L}$$

17. So'nuvchi elektromagnit tebranishlar tenglamasini ko'rsating:

- A) $q = q_m \cos(\omega t + \varphi)$
 B) $q = e^{-\delta t} \cos(\omega t + \varphi)$
 C) $q = q_0 e^{-\delta t} \cos(\omega t + \varphi)$
 D) $q = q_m \sin(\omega t + \varphi)$

18. Rezonans holati uchun amplituda va chastota formulasini ko'rsating:

$$A) A = \frac{f_0}{\sqrt{(\omega_0^2 - \omega^2)^2 + 4\delta^2\omega^2}} \quad \omega = \sqrt{\omega_0^2 - \delta^2}$$

$$B) A = \frac{f_0}{\sqrt{(\omega_0^2 - \omega^2)^2 + 4\delta^2\omega^2}}$$

$$\omega = \sqrt{\frac{k}{m} - \frac{r^2}{4m^2}}$$

$$C) A = \frac{f_0}{2\delta\sqrt{\omega_0^2 - \delta^2}} \quad \omega = \sqrt{\omega_0^2 - 2\delta^2}$$

$$D) A = \frac{f_0}{2\delta\sqrt{\omega_0^2 - \delta^2}} \quad \omega_0 = \sqrt{\frac{1}{LC} - \frac{R^2}{4L^2}}$$

19. Tebranish konturi asilligi uchun to'g'ri keluvchi formulalarini aniqlang
 $Q = \dots$

$$1. = 2\pi \frac{W(t)}{W(t) - W(t+T)} \quad 2. = \frac{\omega_0}{2\delta} \quad 3.$$

$$= \frac{A(t)}{A(t+T)}$$

$$4. = \sqrt{\frac{km}{r}} \quad 5. = \frac{A_0 e^{-\delta t}}{A_0 e^{-\delta(t+T)}} \quad 6$$

$$= \frac{2\pi}{1 - e^{-2\theta}} \quad 7. = e^{\delta T}$$

A) 1,3,5,7

B) 2,3,4,5

C) 1,2,4,6

D) 2,3,5,7

20.So'nuvchi tebranishlar amplitudasi qanchalik bo'lsa, shunchalik tez kamayadi.

- A) tebranishlar chastotasi katta
- B) boshlang'ich amplituda kichik
- C) so'nish koefisienti katta
- D) logarifmik dekrement kichik

21.Qaysi fizik kattalik ushbu formula bilan aniqlanadi:

$$\frac{U_m}{\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}}$$

- A) Konturdagi tokning amplitudaviy qiymati
- B) Kondensator qoplamalaridagi kuchlanishning amplitudaviy qiymati
- C) Kondensator zaryadining amplitudaviy qiymati
- D) Tashqi E.Yu.K. ning amplitudaviy qiymati

22.Yorug'likning vakuumdagi (bo'shliqdagi) tezligi nimaga teng:

- A) $3 \cdot 10^8 \text{ km/soat}$
- B) $3 \cdot 10^6 \text{ km/s}$
- C) $3 \cdot 10^8 \text{ m/s}$
- D) $3 \cdot 10^8 \text{ km/s}$

23.Faqat induktiv g'altakka ega bo'lgan zanjir uchun , o'zgaruvchan tok kuchi amplitudasi formulasini ko'rsating.

A) $I_m = \frac{U_m}{\omega L}$

$$I_m = \omega U_m C$$

B)

C) $I_m = \frac{U_m}{\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}}$

D) $I_m = \frac{U_m}{R_m}$

24.Faqat kondensator, induktiv g'altak va aktiv qarshilikka ega bo'lgan zanjir uchun, o'zgaruvchan tok kuchi amplitudasi formulasini ko'rsating.

A) $I_m = \frac{U_m}{\omega L}$

B)

$$I_m = \omega U_m C$$

C) $I_m = \frac{U_m}{\sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}}$

D) $I_m = \frac{U_m}{R_m}$

25.Kondensatorga ega bo'lgan o'zgaruvchan tok zanjirida...

A) kuchlanish tushishi U_C faza bo'yicha kondensator orqali o'tayotgan I tokdan $\frac{\pi}{2}$ ga orqada qoladi

B) kuchlanish tushishi U_C faza bo'yicha kondensator orqali o'tayotgan I tokdan π ga oldinda bo'ladi

C) kuchlanish tushishi U_C faza bo'yicha kondensator orqali o'tayotgan I tokdan π ga orqada qoladi

D) kuchlanish tushishi U_C faza bo'yicha kondensator orqali o'tayotgan I tokdan $\frac{\pi}{2}$ ga oldinda bo'ladi