FIZIKA

1. Aylanayotgan g'ildirakdagi bir nuqtaning tezligi ikkinchisinikidan 2,5 marta ortiq. Bu ikki nuqtaning markazga intilma tezlanishi necha marta farq qiladi?

A) *6,25* B) *2,5* C) *3,75* D) *1,58*

2. Aylanayotgan g'ildirakdagi bir nuqtaning tezligi ikkinchisinikidan 7 marta ortiq. Bu ikki nuqtaning markazga intilma tezlanishi necha marta farq qiladi?

A) *10,5* B) *7* C) *49* D) *2,65*

3. Tosh baland nuqtadan 4 m/s tezlik bilan gorizontal otildi. 0,3 s o'tgach uning tezligi (m/s) qanday bo'ladi? g=10 m/s^2

A) *4* B) *6* C) *7* D) *5*

4. Tosh baland nuqtadan 40 m/s tezlik bilan gorizontal otildi. Qancha vaqtda (s) tosh 50 m/s tezlikka erishadi? g=10 m/s^2

A) *3* B) *5* C) *0,5* D) *0,3*

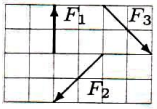
5. Tezyurar Afrosiyob poyezdining tezlanishi 1,2 m/s^2 ga teng. Poyezd vagonlaridan birining shiftida 1 kg massali yuk osilgan. Poyezd gorizontal yo'lda harakatlanayapti deb hisoblab, yukka ta'sir etuvchi barcha kuchlarning teng ta'sir etuvchisi qiymatini (N) toping. g=10 m/s^2

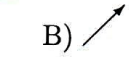
A) *10,1* B) *9,8* C) *1,2* D) *1,7*

6. Tezyurar Afrosiyob poyezdining tezlanishi 1,2 m/s^2 ga teng. Poyezd vagonlaridan birining shiftida 7 kg massali yuk osilgan. Poyezd gorizontal yo'lda harakatlanayapti deb hisoblab, yukka ta'sir etuvchi barcha kuchlarning teng ta'sir etuvchisi qiymatini (N) toping. g=10 m/s^2

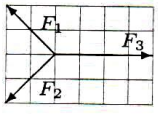
A) *63* B) *70,7* C) *70* D) *8,4*

7. Jismga rasmda ko'rsatilganidek turli yo'nalishlarda kuchlar ta'sir etmoqda. Teng ta'sir etuvchi kuch yo'nalishini aniqlang.



A)  B)  C) D) 

8. Massasi 1 kg bo'lgan jismga rasmda ko'rsatilganidek turli yo'nalishlarda kuchlar ta'sir etmoqda. Jism tezlanishining moduli va yo'nalishini aniqlang. Masshtab birligi=1 N.



A) 2 m/s^2, *chap tomonga* B) *0*
C) 2 m/s^2, *o'ng tomonga* D) 2 m/s^2, *pastga*

9. Qo'zg'almas blok orqali ip o'tkazilib, uning uchlariga 2 kg va 3 kg yuklar osilgan. Ipning tarangligi (N) topilsin.

A) *16* B) *24* C) *18* D) *12*

10. Qo'zg'almas blok orqali ip o'tkazilib, uning uchlariga 2 kg va 9 kg yuklar osilgan. Ipning tarangligi (N) topilsin.

A) *32,7* B) *27,5* C) *42,7* D) *28*

11. 3 kg massali jism havoda 6 m/s^2 tezlanish bilan tushmoqda. Havoning qarshilik kuchi (N) nimaga teng? g=10 m/s^2.

A) *9* B) *12* C) *18* D) *6*

12. 3 kg massali jism havoda tushayotganida unga 24 N qarshilik kuchi ta'sir etmoqda. Jismning tezlanishi (m/s^2) nimaga teng? g=10 m/s^2.

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

13. 2 kg va 3 kg massali ikki jism ip bilan bog'langan. Birinchi jism 7 N gorizontal kuch bilan tortilsa, ipning tarangligi (N) qanday bo'ladi? Ishqalanish koeffitsiyenti 0,3.

A) *3* B) *1* C) *0* D) *2*

14. 2 kg va 1 kg massali ikki jism ip bilan bog'langan. Birinchi jism 13 N gorizontal kuch bilan tortilsa, ipning tarangligi (N) qanday bo'ladi? Ishqalanish koeffitsiyenti 0,3.

A) *4,33* B) *4* C) *3,67* D) *3*

15. Qo'zg'aluvchan blokka mustahkam ip orqali 2 kg va 3 kg yuklar osilgan. Blok yuqoriga 72 N kuch bilan ko'tarilsa, ikkinchi yuk qanday yo'nalishda harakatlanadi?

A) *3,2 m/s^2 tezlanish bilan pastga* B) *yuqoriga*
C) *qo'zg'almay qoladi* D) *pastga*

16. Qo'zg'aluvchan yengil blokka mustahkam ip orqali 3 kg va 4 kg yuklar osilgan. Blok yuqoriga 96 N kuch bilan ko'tarilsa, birinchi yukning tezlanishi (m/s^2) qanday bo'ladi?

A) *4,2* B) *6* C) *8* D) *5*

17. Massasi 0,4 kg bo'lgan metall sharcha yer sirtidan gorizontga nisbatan $\alpha=\pi/8$ burchak ostida otildi va otilish nuqtasidan 0,5 m uzoqlikda joylashgan vertikal devor bilan absolyut elastik to'qnashdi. Bunda sharcha impulsining o'zgarishi moduli 5,2 kg·m/s ga teng bo'ldi. Sharchaning boshlang'ich tezligini (m/s) aniqlang. $sin\alpha$=0,38, $cos\alpha$=0,92.

A) *7,1* B) *2,63* C) *5,3* D) *6,5*

18. Massasi 0,42 kg bo'lgan metall sharcha yer sirtidan gorizontga nisbatan $\alpha=\pi/11$ burchak ostida otildi va otilish nuqtasidan 3,3 m uzoqlikda joylashgan vertikal devor bilan absolyut elastik to'qnashdi. Bunda sharcha impulsining o'zgarishi moduli 7,3 kg·m/s ga teng bo'ldi. Sharchaning boshlang'ich tezligini (m/s) aniqlang. $sin\alpha$=0,28, $cos\alpha$=0,96.

A) *8,69* B) *9* C) *2,5* D) *5*

19. Protonning tezligi $1{,}2v$, alfa-zarra tezligi v. Tezliklar o'zaro tik yo'nalgan. Bu sistemaning to'liq impuls moduli nimaga teng? $v << c$, $m_\alpha = 4m_p$

A) $6{,}6m_pv$ B) $4{,}2m_pv$ C) $3{,}4m_pv$
D) $5{,}6m_pv$

20. Proton tezligi $6v$, alfa-zarra tezligi v. Tezliklar o'zaro tik yo'nalgan. Bu sistema og'irlik markazining tezligi nimaga teng? $v << c$, $m_\alpha = 4m_p$

A) *0,6v* B) $\sqrt{3}v$ C) *0,82v* D) *1,44v*

21. Birinchi dvigatel qayiqqa 3 m/s maksimal tezlik, ikkinchi dvigatel 4 m/s maksimal tezlik, uchinchisi 3 m/s maksimal tezlik bera oladi. Bu uch dvigatel birgalikda qayiqqa qanday maksimal tezlik bera oladi? Suvning qayiq harakatiga qarshilik kuchi tezlikka proporsional deb oling.

A) $\sqrt{38}$ B) $\sqrt{34}$ C) $\sqrt{37}$ D) *10*

22. Birinchi dvigatel qayiqqa 5 m/s maksimal tezlik, ikkinchi dvigatel 5 m/s maksimal tezlik, uchinchisi 6 m/s maksimal tezlik bera oladi. Bu uch dvigatel birgalikda qayiqqa qanday maksimal tezlik bera oladi? Suvning qayiq harakatiga qarshilik kuchi tezlikka proporsional deb oling.

A) $\sqrt{86}$ B) *16* C) *15* D) $\sqrt{92}$

23. Alfa-zarra va proton o'zaro d masofada mahkamlangan. Alfa-zarra bo'shatib yuborilsa, u maksimal $v(v << c)$ tezlikka erishadi. Faqat alfa-zarra emas, ikkala zarra bo'shatib yuborilsa, proton qanday tezlikka erishadi? $m_\alpha = 4m_p$

A) *1,3v* B) *1,5v* C) *1,8v* D) *2,4v*

24. Alfa-zarra va proton o'zaro d masofada mahkamlangan. Agar proton bo'shatib yuborilsa, u maksimal 800 km/s tezlikka erishadi. Faqat proton emas, ikkala zarra bo'shatib yuborilsa, alfa-zarra qanday tezlikka (km/s) erishadi? $m_\alpha = 4m_p$

A) *225* B) *160* C) *179* D) *270*

25. Dastlab cho'zilmagan va bikrligi k=131 N/m bo'lgan prujinaga m=131 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, yukning kinetik energiyasi minimal bo'lgan paytda uning tezlanishi (m/s^2) qanday bo'lishini aniqlang.

A) 5,4 B) 4,9 C) 9,8 D) 0

26. Dastlab cho'zilmagan va bikrligi k=140 N/m bo'lgan prujinaga m=140 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, yukning kinetik energiyasi minimal bo'lgan paytda uning tezlanishi (m/s^2) qanday bo'lishini aniqlang.

A) 4,9 B) 5,4 C) 0 D) 9,8

27. Dastlab cho'zilmagan va bikrligi k=146 N/m bo'lgan prujinaga m=146 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, prujinaning potensial energiyasi maksimal bo'lgan paytda yukning tezlanishi (m/s^2) qanday bo'lishini aniqlang.

A) 4,9 B) 5,4 C) 0 D) 9,8

28. Dastlab cho'zilmagan va bikrligi k=156 N/m bo'lgan prujinaga m=156 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, prujinaning potensial energiyasi maksimal bo'lgan paytda yukning tezlanishi (m/s^2) qanday bo'lishini aniqlang.

A) 5,4 B) 9,8 C) 0 D) 4,9

29. OX o'qi bo'ylab to'lqin uzunligi 8π m bo'lgan ko'ndalang mexanik to'lqin tarqalmoqda. Koordinatasi x=8,28 m bo'lgan nuqtaning tebranish amplitudasi 50 mm va maksimal tezlanishi 125 m/s^2 deb hisoblab, to'lqin tarqalish tezligini (m/s) aniqlang.

A) *300* B) *200* C) *15,9* D) *31,8*

30. OX o'qi bo'ylab to'lqin uzunligi 8π m bo'lgan ko'ndalang mexanik to'lqin tarqalmoqda. Koordinatasi x=106 m bo'lgan nuqtaning tebranish amplitudasi 110 mm va maksimal tezlanishi 1331 m/s^2 deb hisoblab, to'lqin tarqalish tezligini (m/s) aniqlang.

A) *35,05* B) *440* C) *70,1* D) *555*

31. Dastlab cho'zilmagan va bikrligi k=62 N/m bo'lgan prujinaga m=62 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, sistemaning minimal potensial energiyasini toping (mJ).

A) 9,3 B) 4,65 C) 5,15 D) 18,6

32. Dastlab cho'zilmagan va bikrligi k=72 N/m bo'lgan prujinaga m=72 g massali yuk osib qo'yib yuborildi. Prujina maksimal cho'zilganda yukning balandligi h=0 deb hisoblab, sistemaning minimal potensial energiyasini toping (mJ).

A) 21,6 B) 5,4 C) 10,8 D) 5,9

33. Silindrik idish tubining yuzasi 50 sm^2. Idishning tubiga ip bilan plastik shar bog'langan bo'lib, shar to'liq suvning ichida turibdi. Ip kesib yuborilganda shar suvning sirtiga qalqib chiqib, suv sathi 4 sm pasaydi. Ipning dastlabki tarangligi (N) nimaga teng?

A) *4* B) *40* C) *2* D) *0,2*

34. Silindrik idish tubining yuzasi 150 sm^2. Idishning tubiga ip bilan plastik shar bog'langan bo'lib, shar to'liq suvning ichida turibdi. Ip kesib yuborilganda shar suvning sirtiga qalqib chiqib, suv sathi 2 sm pasaydi. Ipning dastlabki tarangligi (N) nimaga teng?

A) *2* B) *20* C) *6* D) *3*

35. Yuk mashinasi yo'lning burilish qismida 4 m/s^2 gorizontal tezlanish bilan harakatlanmoqda. Mashina olib ketayotgan idishdagi suv sirti bunda statsionar og'ma holatga kelgan. Suv sirtidan 10 sm suv ichida joylashgan nuqtadagi gidrostatik bosimni (Pa) aniqlang. g=10 m/s^2

A) *400* B) *2071* C) *1077* D) *2000*

36. Yuk mashinasi yo'lning burilish qismida 4 m/s^2 gorizontal tezlanish bilan harakatlanmoqda. Mashina olib ketayotgan idishdagi suv sirti bunda statsionar og'ma holatga kelgan. Suv sirtidan 40 sm suv ichida joylashgan nuqtadagi gidrostatik bosimni (Pa) aniqlang. g=10 m/s^2

A) *3233* B) *1601* C) *4000* D) *4308*

37. Vodorod molekulalarining ilgarilanma harakat o'rtacha kvadratik tezligi 120 m/s. Gazning temperaturasi (K) qanday?

A) *1,15* B) *2,6* C) *2,85* D) *0,82*

38. Vodorod molekulalarining ilgarilanma harakat o'rtacha kvadratik tezligi 600 m/s. Gazning temperaturasi (K) qanday?

A) *16,7* B) *20,6* C) *24,9* D) *28,9*

39. Geliy molekulalari ilgarilanma harakatining o'rtacha kvadratik tezligi 140 m/s. Gazning temperaturasi (K) qanday?

A) *6,6* B) *3,14* C) *4,7* D) *2,37*

40. Geliy molekulalari ilgarilanma harakatining o'rtacha kvadratik tezligi 500 m/s. Gazning temperaturasi (K) qanday?

A) *20,2* B) *26,3* C) *40,1* D) *33,3*

41. Metan gazi dastlab 20 kPa bosim ostida turibdi. Uning hajmi 0,01 m^3 dan 0,0272 m^3 gacha izotermik oshdi. Metan gazining bajargan ishini (J) toping.

A) *344* B) *200* C) *400* D) *544*

42. Metan gazi dastlab 90 kPa bosim ostida turibdi. Uning hajmi 0,01 m^3 dan 0,0272 m^3 gacha izotermik oshdi. Metan gazining bajargan ishini (J) toping.

A) *1548* B) *2448* C) *900* D) *1200*

43. Metan gazi dastlab 30 kPa bosim ostida turibdi. Uning hajmi 0,01 m^3 dan 0,0272 m^3 gacha izotermik oshdi. Tashqi kuchlarning bajargan ishini (J) toping.

A) *-816* B) *500* C) *-300* D) *-516*

44. Metan gazi dastlab 60 kPa bosim ostida turibdi. Uning hajmi 0,01 m^3 dan 0,0272 m^3 gacha izotermik oshdi. Tashqi kuchlarning bajargan ishini (J) toping.

A) *-1632* B) *-1032* C) *900* D) *-600*

45. Quyidagi tasdiqlardan to'g'rilarini aniqlang.
1) to'yinmagan bug' o'zgarmas bosimda sovitilsa to'yingan bug'ga aylanadi; 2) faqat amorf jismlar izotropdir; 3) bosim ortishi bilan suvning muzlash harorati ko'tariladi; 4) metallar izotrop bo'lishi mumkin

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

46. Quyidagi tasdiqlardan to'g'rilarini aniqlang.
1) elektrik xossalarning turli yo'nalishlarda turlicha bo'lishi anizotropiya deyiladi; 2) tashqi bosim kamaygan sari suyuqlikning qaynash harorati oshadi; 3) namlik oshgan sari psixrometr termometrlari ko'rsatgichlari orasidagi farq ortadi; 4) monokristall kumush issiqlikdan kengayganda uning shakli o'zgaradi

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

47. Quyidagi tasdiqlardan to'g'ri bo'lmaganlarini aniqlang.
1) to'yinmagan bug' o'zgarmas haroratda siqilsa uning zichligi ortadi; 2) suyuqliklarning hajmiy kengayish koeffitsiyenti qattiq jismlarnikidan katta bo'ladi; 3) faqat suyuqliklar oquvchan bo'ladi; 4) alyuminiy eriganda hajmi ortadi, demak uning erish harorati tashqi bosim ortishi bilan kamayadi

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

48. Quyidagi tasdiqlardan to'g'rilarini aniqlang.
1) jismga qo'yilgan kuch yo'nalishi uning sirti bilan $\alpha = \pi/4$ burchak hosil qilganda jism faqat siljish deformasiyasiga uchraydi; 2) kapillyar naychalar bo'ylab suyuqlik doim yuqoriga harakatlanadi; 3) polikristall oltin issiqlikdan kengayganda uning shakli o'zgarmaydi;
4) polikristallar uchun hajmiy kengayish koeffitsiyenti chiziqli kengayish koeffitsiyentidan 3 marta katta

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

49. Temperaturasi 300 K, molekulalari soni $2 \cdot 10^{23}$ ta bo'lgan kislorod gazining hajmi 0,1 m^3 dan 0,272 m^3 gacha izotermik oshdi. Kislorod gazining bajargan ishini toping (J). k=1,38·10^{-23} J/K.

A) $7,2 \cdot 10^3$ B) $8,3 \cdot 10^2$ C) 0 D) $2,1 \cdot 10^3$

50. Temperaturasi 400 K, molekulalari soni $5 \cdot 10^{23}$ ta bo'lgan kislorod gazining hajmi 0,1 m^3 dan 0,272 m^3 gacha izotermik oshdi. Kislorod gazining bajargan ishini toping (J). k=1,38·10^{-23} J/K.

A) $2,8 \cdot 10^3$ B) $1,5 \cdot 10^3$ C) $2,4 \cdot 10^2$ D) 0

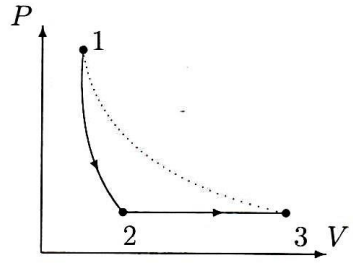
51. 30 litr geliyning ichki energiyasi 450 J. Gazning bosimi (kPa) nimaga teng?

A) *15* B) *20* C) *10* D) *30*

52. Geliy gazi ichki energiyasining zichligi 18 kJ/m^3. Uning bosimi (kPa) nimaga teng?

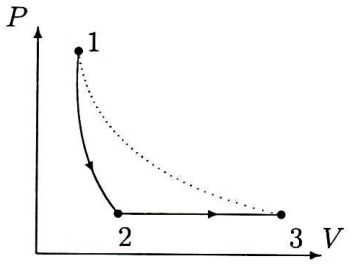
A) *24* B) *36* C) *18* D) *12*

53. Bir atomli ideal gaz dastlab adiabatik, so'ngra izobarik kengaydi. Ideal gazning boshlang'ich temperaturasi oxirgi temperaturasiga teng (rasmga qarang). Gaz to'liq kengayishda 2600 J ish bajarsa, izobarik kengayishda qancha (J) ish bajaradi?



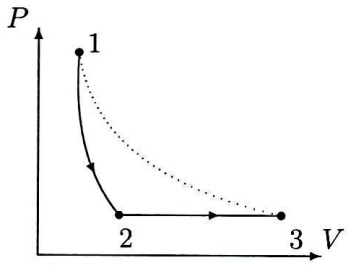
A) *520* B) *2600* C) *1560* D) *1040*

54. Bir atomli ideal gaz dastlab adiabatik, so'ngra izobarik kengaydi. Ideal gazning boshlang'ich temperaturasi oxirgi temperaturasiga teng (rasmga qarang). Gaz to'liq kengayishda 90 kJ ish bajarsa, izobarik kengayishda qancha (kJ) ish bajaradi?



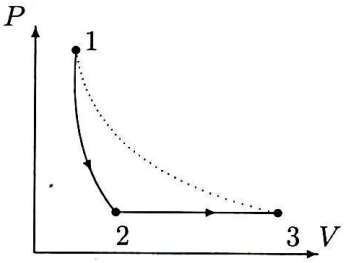
A) *36* B) *22,5* C) *45* D) *54*

55. Bir atomli ideal gaz dastlab adiabatik, so'ngra izobarik kengaydi. Ideal gazning boshlang'ich temperaturasi oxirgi temperaturasiga teng (rasmga qarang). Gaz izobarik kengayishda 230 kJ ish bajarsa, to'liq kengayishda qancha (kJ) ish bajaradi?



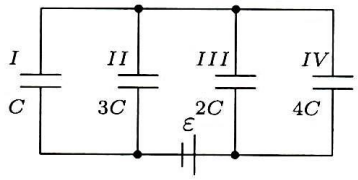
A) *805* B) *230* C) *345* D) *575*

56. Bir atomli ideal gaz dastlab adiabatik, so'ngra izobarik kengaydi. Ideal gazning boshlang'ich temperaturasi oxirgi temperaturasiga teng (rasmga qarang). Gaz izobarik kengayishda 670 J ish bajarsa, to'liq kengayishda qancha (kJ) ish bajaradi?



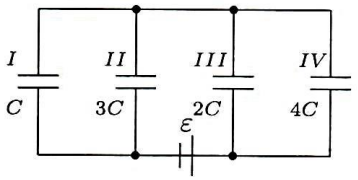
A) *1,005* B) *2,345* C) *0,67* D) *1,675*

57. Keltirilgan sxemaga ko'ra kondensatorlardagi kuchlanishlar nisbati U_{III}/U_{II} topilsin.



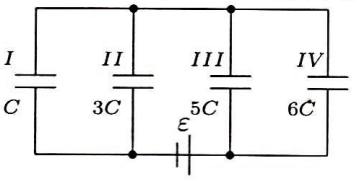
A) *1/3* B) *2/3* C) *16/27* D) *3*

58. Keltirilgan sxemaga ko'ra kondensatorlardagi elektr energiyalar nisbati E_{II}/E_I topilsin.



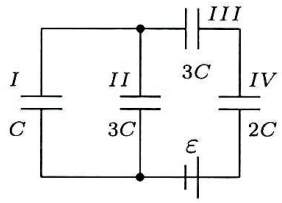
A) *24/11* B) *2* C) *16/27* D) *3*

59. Keltirilgan sxemaga ko'ra kondensatorlar zaryadlarining nisbati q_{IV}/q_I topilsin.



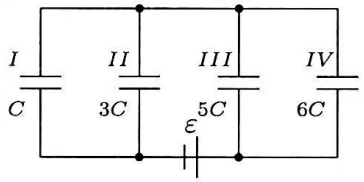
A) *3* B) *5/6* C) *8/11* D) *24/11*

60. Keltirilgan sxemaga ko'ra qaysi kondensatorning elektr energiyasi eng katta?



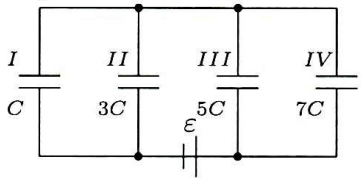
A) *II* B) *III* C) *IV* D) *I*

61. Keltirilgan sxemaga ko'ra qaysi kondensatorda zaryad miqdori eng kam bo'ladi?



A) *IV* B) *II* C) *I* D) *III*

62. Keltirilgan sxemaga ko'ra qaysi kondensatorda zaryad miqdori eng kam bo'ladi?



A) *II* B) *I* C) *IV* D) *III*

63. Doimiy tok manbaiga ulangan yassi havo kondensatorining plastinkalari orasi dielektrik singdiruvchanligi ε=6 bo'lgan muhit bilan to'ldirildi. Bunda plastinkalar orasidagi ta'sir kuchi qanday o'zgardi?

A) *36 marta ortadi* B) *6 marta ortadi*
C) *6 marta kamayadi* D) *2,4 marta kamayadi*

64. Doimiy tok manbaiga ulangan yassi havo kondensatorining plastinkalari orasi dielektrik singdiruvchanligi ε=16 bo'lgan muhit bilan to'ldirildi. Bunda plastinkalar orasidagi ta'sir kuchi qanday o'zgardi?

A) *16 marta kamayadi* B) *4 marta kamayadi*
C) *16 marta ortadi* D) *256 marta ortadi*

65. Nixrom uchun solishtirma qarshilik $1{,}1\cdot10^{-6}$ Ω·m. Nixromdagi tok zichligi 5 A/m^2 bo'lgan sohada elektr maydon kuchlanganligi (μV/m) nimaga teng?

A) *0,22* B) *11* C) *5,5* D) *0,39*

66. Nixrom uchun solishtirma qarshilik $1\cdot10^{-6}$ Ω·m. Nixromdagi tok zichligi 0,4 A/m^2 bo'lgan sohada elektr maydon kuchlanganligi (μV/m) nimaga teng?

A) *0,6* B) *0,4* C) *0,8* D) *0,2*

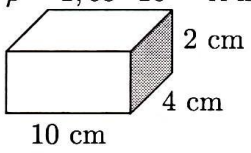
67. O'tkazgichdagi elektr maydon kuchlanganligi 2 V/m, vaqt birligida ajralib chiqayotgan Joul issiqligining zichligi 0,8 μW/m^3. O'tkazgichdagi tok zichligi (μA/m^2) nimaga teng?

A) *0,2* B) *4* C) *0,4* D) *5*

68. O'tkazgichdagi elektr maydon kuchlanganligi 2 V/m, vaqt birligida ajralib chiqayotgan Joul issiqligining zichligi 5 μW/m^3. O'tkazgichdagi tok zichligi (μA/m^2) nimaga teng?

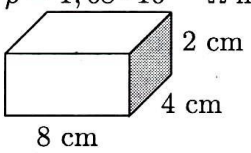
A) *5* B) *10* C) *5/2* D) *7/2*

69. Rasmda keltirilgan parallelepiped shaklidagi mis bo'lagining 10×2 cm^2 yuzali yoqlariga elektrodlar ulansa, uning qarshiligi (Ω) qancha bo'ladi? Misning solishtirma qarshiligi $\rho = 1{,}68\cdot10^{-8}$ Ω·m.



A) $4{,}2\cdot10^{-6}$ B) $8{,}4\cdot10^{-8}$ C) $2{,}1\cdot10^{-6}$
D) $3{,}36\cdot10^{-7}$

70. Rasmda keltirilgan parallelepiped shaklidagi mis bo'lagining 4×2 cm^2 yuzali yoqlariga elektrodlar ulansa, uning qarshiligi (Ω) qancha bo'ladi? Misning solishtirma qarshiligi $\rho = 1{,}68\cdot10^{-8}$ Ω·m.

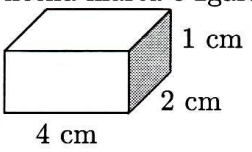


A) $2{,}1\cdot10^{-6}$ B) $1{,}05\cdot10^{-7}$ C) $4{,}2\cdot10^{-7}$
D) $1{,}68\cdot10^{-6}$

71. Elektrodlar parallelepiped shaklidagi metall bo'lagining avval $a\cdot b$ yuzali, keyin $a\cdot c$ yuzali parallel yoqlariga ulansa, uning qarshiligi necha marta o'zgaradi? Bunda a, b, c - paralelipiped qirralari va $a > b > c$.

A) $\frac{b^2}{c^2}$ B) $\frac{a^2}{b^2}$ C) $\frac{a^2}{c^2}$ D) *o'zgarmaydi*

72. Elektrodlar parallelepiped shaklidagi metall bo'lagining avval 1×2 cm^2 yuzali, keyin 1×4 cm^2 yuzali parallel yoqlariga ulansa, uning qarshiligi necha marta o'zgaradi?



A) *2 marta kamayadi* B) *4 marta ortadi*
C) *o'zgarmaydi* D) *4 marta kamayadi*

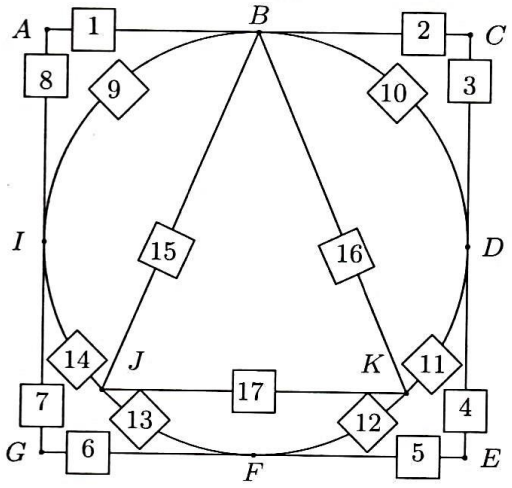
73. O'tkazgich qarshiligi 10 Ω. Tok kuchi $I = 5t$ (A) qonuni bo'yicha ortib borayapti. Dastlabki 2 s davomida o'tkazgichda qancha energiya (J) ajralib chiqadi?

A) *633* B) *605* C) *710* D) *667*

74. O'tkazgich qarshiligi 12 Ω. Tok kuchi $I = 6t$ (A) qonuni bo'yicha ortib borayapti. Dastlabki 5 s davomida o'tkazgichda qancha energiya (J) ajralib chiqadi?

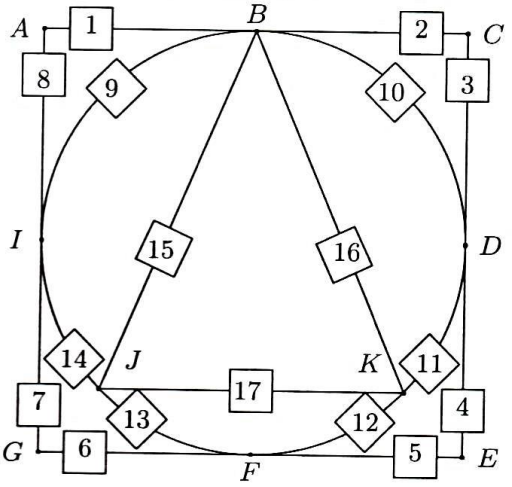
A) *17750* B) *18000* C) *18200* D) *18350*

75. E va F nuqtalar orasidagi umumiy qarshilik qiymati (Ω) qaysi oraliqda yotadi?
$R_1=R_2=R_3=R_4=R_5=R_6=R_7=R_8=29$ Ω,
$R_9=R_{10}=R_{11}=R_{12}=R_{13}=R_{14}=134$ Ω,
$R_{15}=R_{16}=R_{17}=1134$ Ω.



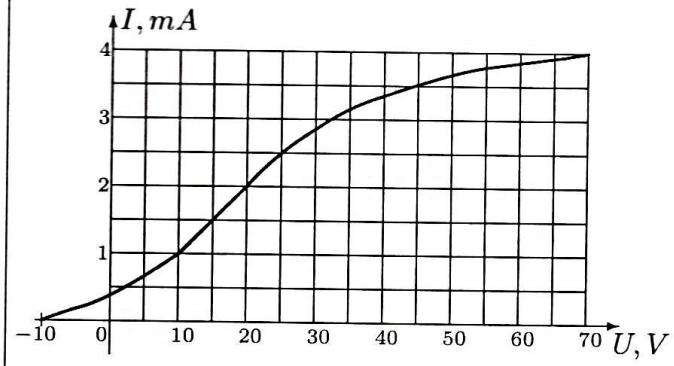
A) *[2245;22245]* B) *[29;134)* C) *[134;2245]*
D) *(0;29)*

76. I va A nuqtalar orasidagi umumiy qarshilik qiymati (Ω) qaysi oraliqda yotadi?
$R_1=R_2=R_3=R_4=R_5=R_6=R_7=R_8=46$ Ω,
$R_9=R_{10}=R_{11}=R_{12}=R_{13}=R_{14}=151$ Ω,
$R_{15}=R_{16}=R_{17}=1151$ Ω.



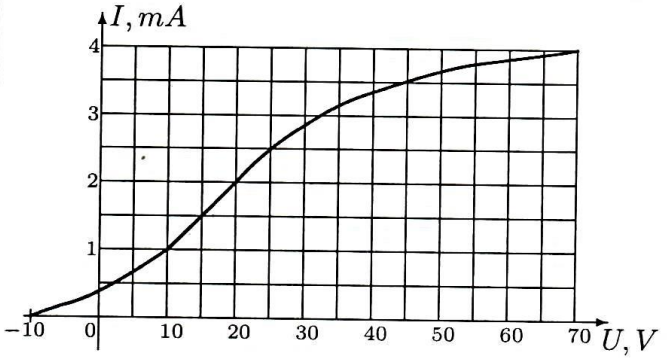
A) *[46;151)* B) *[151;2262]* C) *(0;46)*
D) *[2262;22262]*

77. Rasmda vakuumli dioddagi tok kuchining anod kuchlanishiga bog'liqligi grafik tarzda berilgan. Diodning to'yinish toki (A) qanday?



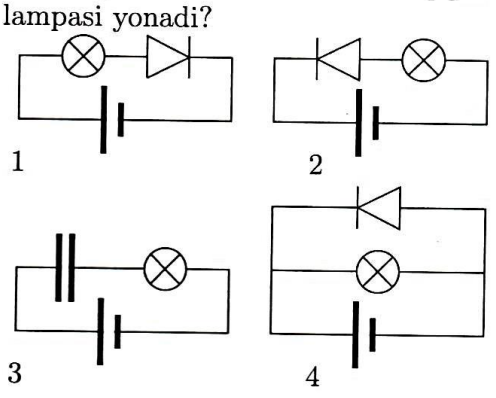
A) *0,4* B) *0,04* C) *4* D) *0,004*

78. Rasmda vakuumli dioddagi tok kuchining anod kuchlanishiga bog'liqligi grafik tarzda berilgan. 70 V kuchlanishni qanday nomlash mumkin?



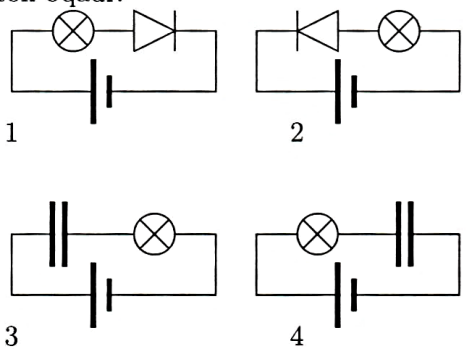
A) *to'yintiruvchi kuchlanish*
B) *yoquvchi kuchlanish*
C) *o'chiruvchi kuchlanish*
D) *tormozlovchi kuchlanish*

79. Keltirilgan elektr sxemalaridan qaysi birida elektr lampasi yonadi?



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

80. Keltirilgan elektr zanjirlaridan qaysi biri orqali tok oqadi?



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

81. O'zaro perpendikulyar bo'lgan elektr (E=120 V/m) va magnit (B=10 T) maydonga, ularga tik ravishda, elektron boshlang'ich v=12 m/s tezlik bilan uchib kirdi. Elektron harakat trayektoriyasi qanday shaklda bo'ladi? Og'irlik kuchining ta'siri inobatga olinmasin. $\vec{v}$, $\vec{E}$, $\vec{B}$ vektorlar mos holda x, y, z o'qlarining musbat yo'nalishi bo'ylab yo'nalgan.

A) *parabola*
B) *o'suvchi qadam bilan spiralsimon*
C) *kamayuvchi qadam bilan spiralsimon*
D) *to'g'ri chiziq*

82. O'zaro perpendikulyar bo'lgan elektr (E=2,73 V/m) va magnit (B=1 T) maydonga, ularga perpendikulyar ravishda, elektron boshlang'ich v=2,73 m/s tezlik bilan uchib kirdi. Elektron harakat trayektoriyasi qanday shaklda bo'ladi? Og'irlik kuchining ta'siri inobatga olinmasin. $\vec{v}$, $\vec{E}$, $\vec{B}$ vektorlar mos holda x, y, z o'qlarining musbat yo'nalishi bo'ylab yo'nalgan.

A) *to'g'ri chiziq* B) *parabola*
C) *kamayuvchi qadam bilan spiralsimon*
D) *o'suvchi qadam bilan spiralsimon*

83. 1 T magnit maydon induksiyasi x koordinata o'qi bo'ylab, 1 m uzunlikdagi metall chizg'ich y o'qi bo'ylab yo'nalgan. Chizg'ich z o'qi bo'ylab 20 m/s tezlik bilan harakatlanmoqda. Chizg'ich uchlari orasida vujudga keladigan induksion elektr maydon potensiallar farqi (V) nimaga teng?

A) *20* B) *5* C) *40* D) *10*

84. 2,5 T magnit maydon induksiyasi x koordinata o'qi bo'ylab, 2 m uzunlikdagi metall chizg'ich y o'qi bo'ylab yo'nalgan. Chizg'ich z o'qi bo'ylab 10 m/s tezlik bilan harakatlanmoqda. Chizg'ich uchlari orasida vujudga keladigan induksion elektr maydon potensiallar farqi (V) nimaga teng?

A) *60* B) *75* C) *50* D) *120*

85. Keltirilgan elektromagnit to'lqinlardan qanday chastotalisi shishada eng kichik tezlik bilan tarqaladi?

A) *1,4 MHz* B) *1,4 THz* C) *1,4 kHz*
D) *1,4 GHz*

86. Tok manbaiga transformator birinchi cho'lg'ami bilan ulanganda ikkinchi cho'lg'amda 8 V kuchlanish hosil bo'ldi. Ikkinchi cho'lg'ami ulanganda esa birinchisida 2 V kuchlanish hosil bo'ldi. Tarmoqdagi kuchlanish (V) nimaga teng?

A) *16* B) *6* C) *10* D) *4*

87. Tok manbaiga transformator birinchi cho'lg'ami bilan ulanganda ikkinchi cho'lg'amda 17,5 V kuchlanish hosil bo'ldi. Ikkinchi cho'lg'ami ulanganda esa birinchisida 2 V kuchlanish hosil bo'ldi. Tarmoqdagi kuchlanish (V) nimaga teng?

A) *19,5* B) *15,5* C) *6* D) *35*

88. Kondensatorning sig'imi 200 μF va g'altagining induktivligi 50 H bo'lgan tebranish konturidagi elektr maydon energiyasi o'zgarish davri (ms) nimaga teng? π=3

A) *300* B) *1200* C) *360* D) *600*

89. Kondensatorning sig'imi 120 μF va g'altagining induktivligi 30 H bo'lgan tebranish konturidagi magnit maydon energiyasi o'zgarish davri (ms) nimaga teng? π=3

A) *180* B) *360* C) *129,6* D) *720*

90. Kondensatorning sig'imi 125 μF va g'altagining induktivligi 20 H bo'lgan tebranish konturidagi magnit maydon energiyasi o'zgarish davri (ms) nimaga teng? π=3

A) *600* B) *300* C) *90* D) *150*

91. O'zgaruvchan tok zanjiriga ketma-ket rezistor (R=10 Ω), kondensator (C=8 mF) va induktiv g'altak (L=80 H) ulangan. Tokning siklik chastotasi ω=1,25 rad/s bo'lgan paytdagi quvvat koeffitsiyentini aniqlang.

A) *0,5* B) *0* C) *1* D) *0,7*

92. O'zgaruvchan tok zanjiriga ketma-ket rezistor (R=10 Ω), kondensator (C=13 mF) va induktiv g'altak (L=130 H) ulangan. Tokning siklik chastotasi ω=0,77 rad/s bo'lgan paytdagi quvvat koeffitsiyentini aniqlang.

A) *0,41* B) *0* C) *0,87* D) *1*

93. Olmosning zichlig 3500 kg/m^3 ekanligi ma'lum. Agar 0,6c (c - yorug'lik tezligi) tezlikda uchayotgan kosmik kemadagi kosmonavt optik va boshqa asboblar bilan Yerdagi olmosning zichligini (kg/m^3) o'lchasa, qanday natija oladi?

A) *5470* B) *4380* C) *4630* D) *5620*

94. Olmosning zichlig 3500 kg/m^3 ekanligi ma'lum. Agar 0,8c (c - yorug'lik tezligi) tezlikda uchayotgan kosmik kemadagi kosmonavt optik va boshqa asboblar bilan Yerdagi olmosning zichligini (kg/m^3) o'lchasa, qanday natija oladi?

A) *7670* B) *4630* C) *5830* D) *9720*

95. Ikki elektron bir-biriga $0{,}9c$ va $0{,}6c$ tezliklar bilan yaqinlashmoqda. Ularning nisbiy tezligi qanday?
A) *1,25c* B) *0,92c* C) *0,97c* D) *1,50c*

96. Kosmik kemalar bir xil yo'nalishda bir xil $0{,}5c$ tezlik bilan uchmoqda. Birinchi kosmik kemadagi olim kemadagi yukning massasini 1 kg ekanligini qayd qildi. Ikkinchi kemadagi olim o'z kemasidan turib birinchi kemadagi yukning massasini o'lchasa qanday (kg) natijani qayd qiladi?
A) *1,15* B) *1* C) *1,54* D) *0,87*

97. Lazerning kuchaytirgich optik elementining uzunligi 12 sm, uning uchlari ko'zguga aylantirilgan bo'lib, nur uning ichida borib-keladi. Agar bu muhitning sindirish ko'rsatgichi 1,5 bo'lsa, nur 0,01 s davomida kuchaytirgich bo'ylab qancha yo'l (km) bosadi?
A) $2 \cdot 10^8$ B) $3 \cdot 10^8$ C) $2 \cdot 10^6$ D) $2 \cdot 10^3$

98. Lazerning kuchaytirgich optik elementining uzunligi 20 sm, uning uchlari ko'zguga aylantirilgan bo'lib, nur uning ichida borib-keladi. Agar bu muhitning sindirish ko'rsatgichi 1,5 bo'lsa, nur 0,5 ms davomida kuchaytirgich bo'ylab necha marta borib-keladi?
A) $3 \cdot 10^5$ B) $2{,}5 \cdot 10^5$ C) $2{,}5 \cdot 10^8$
D) $2 \cdot 10^4$

99. To'lqin uzunligi 480 nm bo'lgan elektromagnit to'lqin shaffof plyonkaga tik tushmoqda. Plyonkaning qalinligi 36 μm, sindirish ko'rsatgichi 1,6. Plyonka ichida necha to'lqin uzunligi joylashadi?
A) *96* B) *120* C) *47* D) *84*

100. To'lqin uzunligi 480 nm bo'lgan elektromagnit to'lqin shaffof plyonkaga tik tushmoqda. Plyonkaning qalinligi 48 μm, sindirish ko'rsatgichi 1,6. Plyonka ichida necha to'lqin uzunligi joylashadi?
A) *62* B) *160* C) *124* D) *79*

101. Chastotalari teng, o'zaro tik va chiziqli qutblangan ikki kogerent nur ekranda qo'shilmoqda. Birinchi nur intensivligi I, ikkinchisiniki $2I$. Ekrandagi maksimal intensivlik qanday bo'ladi?
A) *3,17I* B) *5,8I* C) *2,1I* D) *3I*

102. Chastotalari teng, o'zaro tik va chiziqli qutblangan ikki kogerent nur ekranda qo'shilmoqda. Birinchi nur intensivligi I, ikkinchisiniki $I/3$. Ekrandagi maksimal intensivlik qanday bo'ladi?
A) *2,5I* B) *1,3I* C) *2,8I* D) *3,3I*

103. Lazer nurining impulsi 15 J energiyaga ega. Impuls o'siga nisbatan tik joylashgan 1,6 mg massali zarqog'ozdan to'liq akslanadi. Natijada zarqog'oz oladigan tezlik (m/s) nimaga teng bo'ladi?
A) *0,12* B) *0,06* C) *0,03* D) *0,04*

104. Lazer nurining impulsi 35 J energiyaga ega. Impuls o'siga nisbatan tik joylashgan 1,6 mg massali zarqog'ozdan to'liq akslanadi. Natijada zarqog'oz oladigan tezlik (m/s) nimaga teng bo'ladi?
A) *0,28* B) *0,035* C) *0,07* D) *0,15*

105. Vodorod atomidagi elektron asosiy holatida $-13{,}6$ eV energiyaga ega. To'rtinchi kvant holatidagi elektron energiyasi (eV) nimaga teng?
A) $-3{,}4$ B) $-0{,}85$ C) *0,85* D) *3,4*

106. Vodorod atomidagi elektron asosiy holatida $-13{,}6$ eV energiyaga ega. Ettinchi kvant holatidagi elektron energiyasi (eV) nimaga teng?
A) *1,94* B) $-0{,}28$ C) *0,28* D) $-1{,}94$

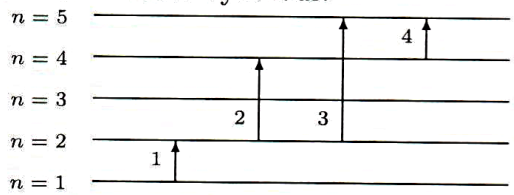
107. Neytronning spini nimaga teng?
A) $h/2\pi$ B) $h/4$ C) $h/2$ D) $h/4\pi$

108. Quyida keltirilgan fikrlarning qaysilari to'g'ri?
1) Yorug'likning shisha prizmadan dispersiyasi uning to'lqin xossalarini tasdiqlaydi. 2) Fotoeffekt qizil chegarasining mavjudligi yorug'likda kvantlar mavjudligini tasdiqlaydi.
3) Fotoeffektning qizil chegarasi $\lambda_{max} = A/ch$ ga teng. 4) Plank doimiysining birligi J/s.
A) *2, 4* B) *1, 3* C) *3, 4* D) *1, 2*

109. De-Broyl faraziga ko'ra $p = h/\lambda$, $E = h\nu$ munosabatlar faqat fotonlarga emas, elektronlarga ham qo'llanishi mumkin. Ikkinchi tenglikka asosan harakatdagi elektron tebranishlarining chastotasini (Hz) aniqlang. Harakatdagi elektron energiyasi $2{,}32 \cdot 10^{-13}$ J, $h = 6{,}63 \cdot 10^{-34}$ J·s.
A) $3{,}5 \cdot 10^{18}$ B) $3{,}5 \cdot 10^{19}$ C) $3{,}5 \cdot 10^{20}$
D) $3{,}5 \cdot 10^{21}$

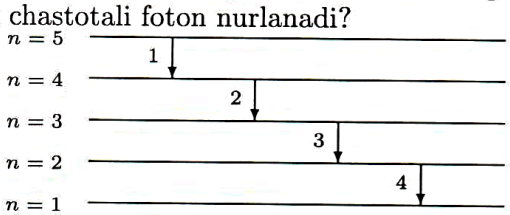
110. De-Broyl faraziga ko'ra $p = h/\lambda$, $E = h\nu$ munosabatlar faqat fotonlarga emas, elektronlarga ham qo'llanishi mumkin. Ikkinchi tenglikka asosan harakatdagi elektron tebranishlarining chastotasini (Hz) aniqlang. Harakatdagi elektron energiyasi $4{,}64 \cdot 10^{-13}$ J, $h = 6{,}63 \cdot 10^{-34}$ J·s.
A) $7 \cdot 10^{20}$ B) $1{,}5 \cdot 10^{19}$ C) $1{,}5 \cdot 10^{18}$
D) $7 \cdot 10^{21}$

111. Rasmda elektronning vodorod atomi energetik sathlari orasidagi o'tishlari tasvirlangan (masshtab saqlanmagan). Qaysi o'tishda eng kichik chastotali foton yutiladi?



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

112. Rasmda elektronning vodorod atomi energetik sathlari orasidagi o'tishlari tasvirlangan (masshtab saqlanmagan). Qaysi o'tishda eng kichik chastotali foton nurlanadi?



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

113. Fosfor-32 izotopining yarim yemirilish davri 14,3 sutka. Shu izotopning o'rtacha yashash vaqtini (sutka) aniqlang.

A) *9,9* B) *28,6* C) *20,6* D) *14,3*

114. Mis-64 izotopining yarim yemirilish davri 12,8 soat. Shu izotopning o'rtacha yashash vaqtini (soat) aniqlang.

A) *8,9* B) *12,8* C) *25,6* D) *18,4*

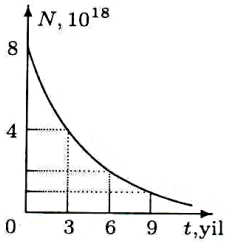
115. Radiy-226 izotopining o'rtacha yashash vaqti 2304 yil. Shu izotopning yarim yemirilish davrini (yil) aniqlang.

A) *3200* B) *1152* C) *2304* D) *1600*

116. Yevropiy-154 izotopining o'rtacha yashash vaqti 23 yil. Shu izotopning yarim yemirilish davrini (yil) aniqlang.

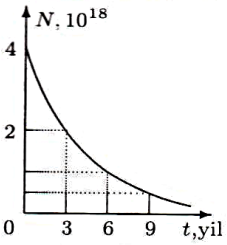
A) *32* B) *11,5* C) *16* D) *23*

117. Rasmda qandaydir modda atomlar sonining vaqtga bog'liqlik grafigi keltirilgan. Shu grafikdan foydalanib, 12 yilda ichida qancha atom yemirilganini aniqlang.



A) $5 \cdot 10^{17}$ B) $7 \cdot 10^{18}$ C) $4 \cdot 10^{18}$ D) $7{,}5 \cdot 10^{18}$

118. Rasmda qandaydir modda atomlar sonining vaqtga bog'liqlik grafigi keltirilgan. Shu grafikdan foydalanib, necha yildan so'ng 10^{18} ta atom qolishini aniqlang.



A) *12* B) *3* C) *6* D) *9*

119. Tinchlikdagi massasi $2{,}2 \cdot 10^{-28}$ kg bo'lgan zarracha $0{,}3c$ tezlik bilan harakatlanganda parchalanib ikkita γ-kvantga aylandi. Birinchi γ-kvant zarrachaning dastlabki harakat yo'nalishida nurlandi deb hisoblab, ularning chastotalari ν_1 va ν_2 ni taqqoslang. c - yorug'lik tezligi.

A) $\nu_1 \leq \nu_2$ B) $\nu_1 = \nu_2$ C) $\nu_1 > \nu_2$
D) $\nu_1 < \nu_2$

120. Tinchlikdagi massasi $3{,}4 \cdot 10^{-28}$ kg bo'lgan zarracha $0{,}25c$ tezlik bilan harakatlanganda parchalanib ikkita γ-kvantga aylandi. Birinchi γ-kvant zarrachaning dastlabki harakat yo'nalishida nurlandi deb hisoblab, ularning chastotalari ν_1 va ν_2 ni taqqoslang. c - yorug'lik tezligi.

A) $\nu_1 > \nu_2$ B) $\nu_1 \leq \nu_2$ C) $\nu_1 < \nu_2$
D) $\nu_1 = \nu_2$