

# HARBIY BAZA 2019-yil YECHIMLARI

(1-qism:1-146)

Samarqand-2019

Ushbu yechimlar JANOB FIZIKLAR(@janob\_fiziklar) kanali adminlari tomonidan yozilgan. Ayrim xato-kamchiliklar bo'lsa uzr so'raymiz!

Hurmat bilan: Shukurillo Mamatqulov va Xumoyun Nurimov!

Telegramdagi manzilimiz

KANAL: @janob\_fiziklar

GURUH: @janob\_fiziklar1

1 Kulonometr - elektroliz vaqtida  
sarfatchi o'lchaydi

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2 Kritik tok - o'tkazgichdagi sönmay  
digan doimiy elektrik tokning  
öta - o'tkazgichning normal holatga  
o'tkazadigan chegaraviy qiymati

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3 Vilson kamerasining ishchi maymi  
suynig yoki spirtning töyungan bugi  
bölgen havo yoki gaz bilan töldirilgan  
Vilson kamerasi - havoda uchib ötayot-  
gan zarra hosil qildigan ionlarning  
öta töyungan bugi uchun kondensat-  
siya markasi bolib qolishiga asoslan-  
gan.

N.X.&.1.6.0.3

4 Gaslarda asosiy tok tashuvchilar  
musbat va manfiy ionlar namda  
elektronlardir.

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5 Vakuumda tok tashuvchilar  
erkin elektronlardir.

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6 Metallarda elektr tokini  
elektronlar tashiydi erkin

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7 Elektrolitlarda elektr tokini  
musbat va manfiy ionlar tashiydi

8 Yarimötkazgichlarda elektr tokini  
elektronlar va kovaklar tashiydi.

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9 Kamerton - aniq bir chastotali tarvish chiqaradigan asbob

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10 Atomning diskret energetik sathlarining mavjudligi 1913-yilda nemis fiziklari D. Frank va G. Gerstlar tomonidan otkirilgan tajriba bilan tasdiqlangan. Tajriba asosida quyidagi g'oya yotadi: Yadro atro-fida aylanayotgan elektron o'sining energiyasini asta-sekin bir tekis o'tqartira olmaydi.

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Umumiy qoida @Janob\_Fiziklar

1° Leptonlar - kuchli ta'sirlashuvdan boshqa har uchala ta'sirlashuvda ham ishtirok etadi. Leptonlar ("Leptos" yunoncha - yengil) elektronlar, pozitronlar,  $\mu$ -mesonlar va neytrinolaridir. Leptonlar +1 lepton zaryadiga, antileptonlari esa -1 lepton zaryadiga ega. Demak bu zarralar da elektromagnit, kuchli va gravitatsion ta'sirlar kuzatiladi.

2° Fotonlar - gravitatsion va elektromagnit ta'sirlarda ishtirok etuvchi zarralar

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3° Gravitonlar - faqat gravitatsion ta'sirlashuvda ishtirok etadi

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↓  
savollar N.X.&1.6.0.3

20 tortishadi 26 tortishadi

21 tortishadi 27 tortishadi

22 tortishadi

23 tortishadi

24 tortishadi

25 tortishadi

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Yuqoridagi qoidani o'qing ???

N.X.&1.6.0.3

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Elektron massaga, zaryadi manfiy ishorali.

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Antineutron neytron bilan massasi ham nolga teng ular faqat magnit momentlarining ishorasi bilan farq qiladi. Elektron va antineutron massaga ega bo'lganligi uchun ular orasida gravitatsiya ta'siri mavjud. Lekin antineutron zaryadi yoqligi uchun ular orasida elektromagnit ta'sir kusa-tilmaydi. Faqat gravitatsiya ta'siri tufayli ular tortishadi.

Javob N.X.&1.6.0.3

Tortishadi

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↓  
Bolg'alaru yana shunday tahlil qilinadi

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gravitatsiya kuchi tufayli elektron va neytron tortiladi

J: tortiladi

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N.X.&1.6.0.3

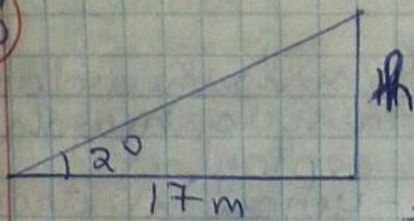
Fotonlar gravitatsion va elektromagnit ta'sirlashuvda ishtirok etadigan zarralar. Elektronlar ham xuddi shunday xususiyatga ega.

Demak, ular ham tortiladi

J: Tortiladi @Janob\_Fiziklar

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$$\pi = 3 \quad \sin d \approx d$$

$$\sin d \approx \operatorname{tg} d \approx d = \frac{h}{17}$$

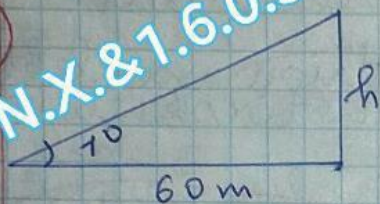
$$\frac{h}{17} = 2^\circ \cdot \frac{\pi}{180^\circ} = \frac{\pi}{90}$$

$$h = \frac{17 \pi}{90} = \frac{17 \cdot 3}{90} = \frac{17}{30} \text{ m}$$

N.X.&1.6.0.3

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$$\pi = 3 \quad \sin d \approx d$$

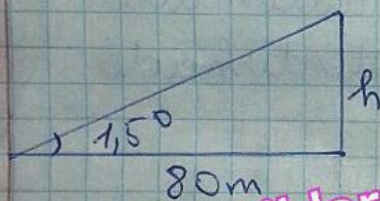
$$\sin d \approx \operatorname{tg} d \approx d = \frac{h}{60}$$

$$\frac{h}{60} = 1^\circ \cdot \frac{\pi}{180^\circ} = \frac{\pi}{180}$$

$$h = \frac{60 \pi}{180} = \frac{60 \cdot 3}{180} = 1 \text{ m}$$

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$$\pi = 3 \quad \sin d \approx d$$

$$\sin d \approx \operatorname{tg} d \approx d = \frac{h}{80}$$

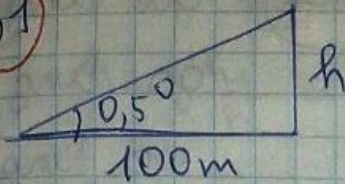
$$\frac{h}{80} = 1,5^\circ \cdot \frac{\pi}{180^\circ}$$

$$h = \frac{80 \cdot 1,5^\circ \cdot 3}{180^\circ} = 2 \text{ m}$$

N.X.&1.6.0.3

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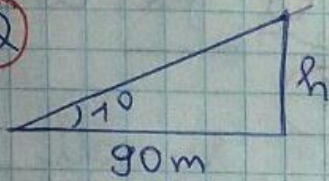
$$n = 3 \quad \sin d \approx d$$

$$\sin d \approx \text{tg} d \approx d = \frac{h}{100}$$

$$\text{N.X. \& 1.6.0.3} \quad \frac{h}{100} = 0,5^\circ \cdot \frac{\pi}{180^\circ} = \frac{\pi}{360}$$

$$h = \frac{100\pi}{360} = \frac{100 \cdot 3}{360} = \frac{10}{12} = \frac{5}{6} \text{ m}$$

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$$n = 3 \quad \sin d \approx d$$

$$\sin d \approx \text{tg} d \approx d = \frac{h}{90}$$

$$\frac{h}{90} = 1^\circ \cdot \frac{\pi}{180^\circ} \Rightarrow h = \frac{90\pi}{180} = \frac{\pi}{2} = \frac{3}{2} = 1,5 \text{ m}$$

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- 33. Protanni spini  $S = \frac{1}{2}$  ga teng
- 34. Elektronni spini  $S = \frac{1}{2}$  ga teng
- 35. Pozitronning spini  $S = \frac{1}{2}$  ga teng
- 36. Neytronning spini  $S = \frac{1}{2}$  ga teng
- 37.  $\pi$  - mezoning spini  $S = 0$  ga teng
- 38. k - mezoning spini  $S = 0$  ga teng
- 39. Gravitanning spini  $S = 2$  ga teng
- 40. Neytronning spini  $S = \frac{1}{2}$  ga teng
- 41.  $\Delta$  - rezonansning spini  $S = \frac{3}{2}$  ga teng

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51 bilan bir xil

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$$h_2 = \frac{h_1}{n} = \frac{3 \text{ m}}{\frac{4}{3}} = \frac{9 \text{ m}}{4} = 2,25 \text{ m}$$

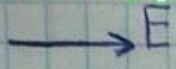
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$$h_2 = \frac{h_1}{n} = \frac{1 \text{ m}}{\frac{4}{3}} = \frac{3}{4} \text{ m} = 0,75 \text{ m}$$

N.X.&1.6.0.3

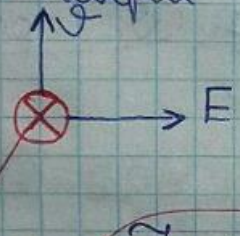
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Magnit maydon induktsiyasi yo'nalishi bizdan chizma tekisligi tomon deyilgan. Bunda ikki belgi qo'yiladi.  $\odot$  va  $\otimes$ . Buni bilishimiz uchun kamon o'qini tarasaver qilishimiz kerak. Kamon bizdan ketgani  $\times$  bo'lib ko'rinadi. Bizga tomon kelayotgan bo'lsa  $\bullet$  nuqta bo'lib ko'rinadi.

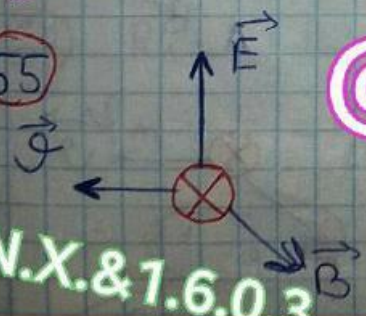
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$v$  ning yo'nalishi chap qol qoidasi yordamida aniqlanadi.

$J: v$  yuqoriga

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N.X.&1.6.0.3

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$J: v$  chapga

$v$  ning yo'nalishi chap qol qoidasi yordamida topiladi.

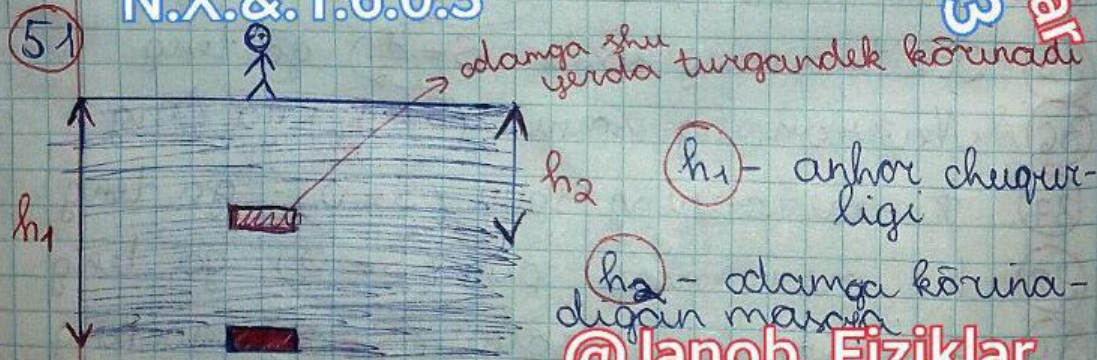


- 42)  $\Omega$  - Giperonning spini  $S = \frac{3}{2}$  ga teng
- 43) Fotanning spini  $S = 1$  ga teng
- 44) Glyuonning spini  $S = 1$  ga teng
- 45) Kwarkning spini  $S = \frac{1}{2}$  ga teng
- 46) Myuonning spini  $S = \frac{1}{2}$  ga teng
- 47)  $\eta$  - mezonning spini  $S = 0$  ga teng
- 48)  $\frac{\text{Proton spini}}{\text{Myuon spini}} = \frac{\frac{1}{2}}{\frac{1}{2}} = 1$

48)  $\frac{\text{Graviton spini}}{\text{Myuon spini}} = \frac{2}{\frac{1}{2}} = 4$

50)  $\frac{\text{Foton spini}}{\text{elektron spini}} = \frac{1}{\frac{1}{2}} = 2$

N.X.&.1.6.0.3



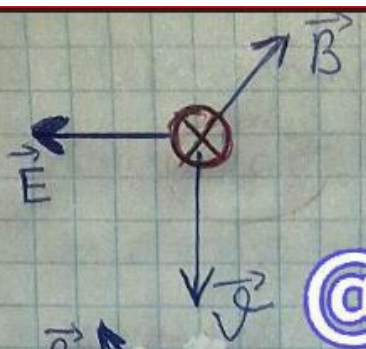
$h_2 = \frac{h_1}{n} = \frac{2\text{ m}}{\frac{4}{3}} = \frac{6\text{ m}}{4} = 1,5\text{ m}$

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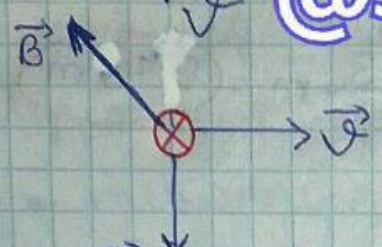


N.X.&1.6.0.3

$\vec{J}$ :  $\varnothing$  - Pastga

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$\vec{J}$ :  $\varnothing$  - o'ngga

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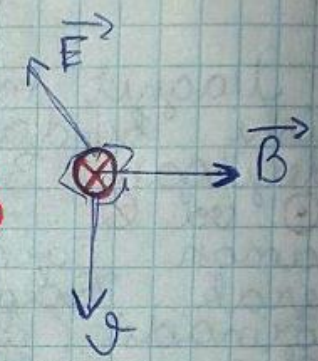
58



$\vec{J}$ :  $\varnothing$  chapga

N.X.&1.6.0.3

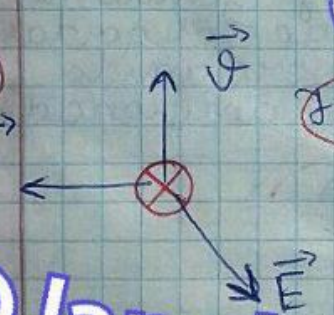
59



$\vec{J}$ :  $\varnothing$  pastga

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60



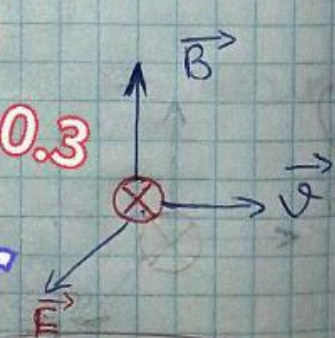
$\vec{J}$ :  $\varnothing$  yuqoriga

N.X.&1.6.0.3

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N.X.&1.6.0.3

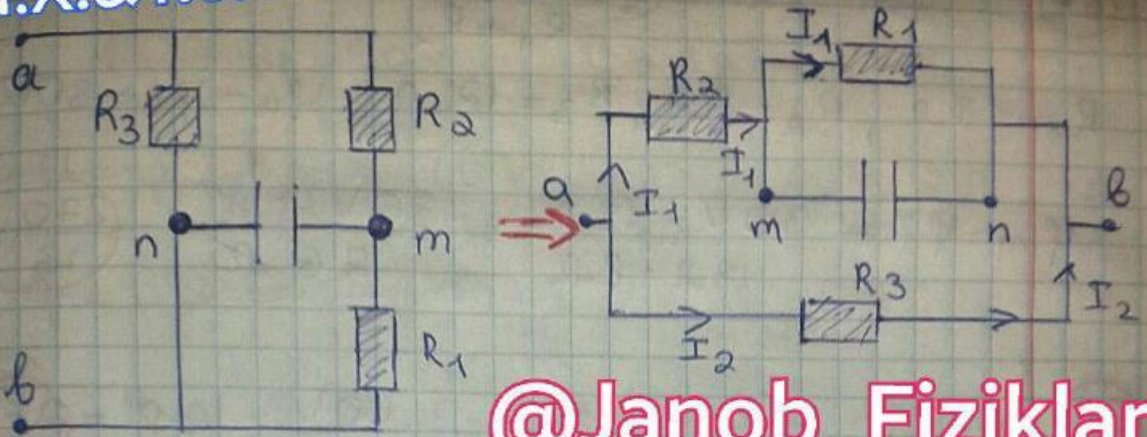
61



$\vec{J}$ :  $\varnothing$  o'ngga

N.X.&1.6.0.3

Umumiy qoida



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$$\begin{cases} (\varphi_a - \varphi_b) = I_1 R_1 + I_1 R_2 = I_1 \cdot (R_1 + R_2) \\ (\varphi_m - \varphi_n) = I_1 R_1 \end{cases}$$

N.X.&1.6.0.3

$$\frac{\varphi_a - \varphi_b}{\varphi_m - \varphi_n} = \frac{R_1 + R_2}{R_1} \Rightarrow \varphi_m - \varphi_n = \frac{(\varphi_a - \varphi_b) \cdot R_1}{R_1 + R_2}$$

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62  $R_1 = 8 \Omega$   $R_2 = 12 \Omega$   $R_3 = 10 \Omega$

N.X.&1.6.0.3 @Janob\_Fiziklar

$\varphi_a - \varphi_b = 60V$

$$\varphi_m - \varphi_n = \frac{60V \cdot 8 \Omega}{8 \Omega + 12 \Omega} = \frac{60V \cdot 8 \Omega}{20 \Omega} = 24V$$

N.X.&1.6.0.3

63  $R_1 = 10 \Omega$ ;  $R_2 = 8 \Omega$ ;  $R_3 = 4 \Omega$ ;  $\varphi_a - \varphi_b = 20V$

$$\varphi_m - \varphi_n = \frac{20V \cdot 10 \Omega}{10 \Omega + 8 \Omega} = \frac{200V \cdot \Omega}{18 \Omega} = \frac{100}{9} V$$

$= 11 \frac{1}{9} V$

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64  $\varphi_m - \varphi_n = \frac{(\varphi_a - \varphi_b) \cdot R_1}{R_1 + R_2}$  N.X.&1.6.0.3

$R_1 = 18 \Omega, R_2 = 8 \Omega, R_3 = 12 \Omega, \varphi_a - \varphi_b = 30V$

$\varphi_m - \varphi_n = \frac{30V \cdot 18 \Omega}{18 \Omega + 8 \Omega} = \frac{30V \cdot 18 \Omega}{26 \Omega} = \frac{270}{13} V$

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65  $\varphi_m - \varphi_n = \frac{40V \cdot 12 \Omega}{12 \Omega + 8 \Omega} = \frac{40V}{20 \Omega} \cdot 12 \Omega = 24V$

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66  $R_1 = 8 \Omega, R_2 = 12 \Omega, R_3 = 10 \Omega, \varphi_a - \varphi_b = 60V$

N.X.&1.6.0.3  $C = 1 \mu F$  N.X.&1.6.0.3

$U = \varphi_m - \varphi_n = \frac{60V \cdot 8 \Omega}{8 \Omega + 12 \Omega} = \frac{60V \cdot 8 \Omega}{20 \Omega} = 24V$

$q = CU = 1 \cdot 10^{-6} F \cdot 24V = 24 \mu C$

67  $R_1 = 6 \Omega; R_2 = 14 \Omega; R_3 = 10 \Omega$

$\varphi_a - \varphi_b = 80V, C = 1 \mu F$

$U = \frac{80V \cdot 6 \Omega}{6 \Omega + 14 \Omega} = \frac{80V \cdot 6 \Omega}{20 \Omega} = 24V$

$q = CU = 1 \cdot 10^{-6} F \cdot 24V = 24 \mu C$

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N.X.&1.6.0.3

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68  $R_1 = 12 \Omega$   $R_2 = 8 \Omega$   $R_3 = 10 \Omega$   
 $\varphi_a - \varphi_b = 60 V$   $C = 1 \mu F$

$$U = \varphi_m - \varphi_n = \frac{60 V \cdot 12 \Omega}{12 \Omega + 8 \Omega} = \frac{60 V \cdot 12 \Omega}{20 \Omega} = 36 V$$

$$q = CU = 1 \cdot 10^{-6} F \cdot 36 V = 36 \mu C$$

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N.X.&.1.6.0.3

69  $R_1 = 18 \Omega$ ;  $R_2 = 8 \Omega$ ;  $R_3 = 12 \Omega$

$\varphi_a - \varphi_b = 60 V$   $C = 1 \mu F$

N.X.&.1.6.0.3

$$U = \varphi_m - \varphi_n = \frac{60 V \cdot 18 \Omega}{18 \Omega + 8 \Omega} = \frac{60 V \cdot 18 \Omega}{26 \Omega} = \frac{540 V}{13}$$

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$$q = CU = 1 \mu F \cdot \frac{540 V}{13} = \frac{540}{13} \mu C$$

70  $x = A \sin(800\pi(t - 905y))$

$$x = A \sin(\omega(t - \frac{y}{v}))$$

$$\begin{cases} \omega = 800\pi & L = 800 m \\ \frac{1}{v} = 0,05 & \lambda = v \cdot T = v \cdot \frac{2\pi}{\omega} \end{cases}$$

$v = 20 m/s$   $\omega = 800\pi rad/s$

$$\lambda = \frac{v \cdot 2\pi}{\omega} = \frac{1}{20} m = 0,05 m \quad N = \frac{L}{\lambda} = \frac{800 m}{\frac{1}{20} m} = 16000$$

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N.X.&.1.6.0.3

$$71) x = A \sin(800\pi(t - 0,01y))$$

$$x = A \sin\left(\omega\left(t - \frac{y}{v}\right)\right)$$

$$\begin{cases} \omega = 800\pi \frac{\text{rad}}{\text{s}} \\ v = 100 \frac{\text{m}}{\text{s}} \end{cases}$$

$$L = 400 \text{ m}$$

$$\lambda = v \cdot T = v \frac{2\pi}{\omega}$$

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$$\lambda = \frac{100 \cdot 2\pi}{800\pi} = \frac{1}{4} \text{ m}$$

N.X.&1.6.0.3

$$N = \frac{L}{\lambda} = \frac{400 \text{ m}}{\frac{1}{4} \text{ m}} = 1600$$

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72)

$$x = A \sin(100\pi(t - 0,05y))$$

$$x = A \sin\left(\omega\left(t - \frac{y}{v}\right)\right)$$

N.X.&1.6.0.3

$$\begin{cases} \omega = 100\pi \frac{\text{rad}}{\text{s}} \\ v = 20 \text{ m/s} \end{cases}$$

$$L = 400 \text{ m}$$

$$\lambda = v \cdot T = v \frac{2\pi}{\omega}$$

$$\lambda = 20 \cdot \frac{2\pi}{100\pi} = 0,4 \text{ m}$$

$$N = \frac{L}{\lambda} = \frac{400 \text{ m}}{0,4 \text{ m}} = 1000$$

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73)

$$x = A \sin(800\pi(t - 0,01y))$$

$$x = A \sin\left(\omega\left(t - \frac{y}{v}\right)\right)$$

@Janob\_Fiziklar N X & 1 6 0 3

$$\begin{cases} \omega = 800\pi \frac{\text{rad}}{\text{s}} \\ v = 100 \frac{\text{m}}{\text{s}} \end{cases}$$

$$L = 600 \text{ m}$$

$$\lambda = v \cdot T = v \frac{2\pi}{\omega}$$

$$\lambda = 100 \frac{\text{m}}{\text{s}} \cdot \frac{2\pi}{800\pi} = \frac{1}{4} \text{ m}$$

$$N = \frac{L}{\lambda} = \frac{600 \text{ m}}{\frac{1}{4} \text{ m}} = 2400$$

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N.X.&1.6.0.3

74)  $E = 0,01 \sin(1000(t - \frac{x}{500}))$

$$E = E_0 \sin(\omega t + kx + d_0)$$

$$E = 0,01 \sin(1000t - 2x)$$

$$k = 2$$

$$k = \frac{\omega}{v} = \frac{2\pi v}{v} = \frac{2\pi}{v \cdot T} = \frac{2\pi}{\lambda}$$

$$\lambda = \frac{2\pi}{k} = \frac{2\pi}{2} = \pi \text{ m}$$

N.X.&1.6.0.3

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75)  $E = 0,01 \sin(1000t - 2,5x)$

$$k = 2,5$$

$$\lambda = \frac{2\pi}{k} = \frac{2\pi}{2,5} = \frac{2\pi \cdot 2}{5} = 0,8\pi$$

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76)  $E = 0,01 \sin(1000t - 4x)$

$$k = 4$$

$$\lambda = \frac{2\pi}{k} = \frac{2\pi}{4} = 0,5\pi \text{ m}$$

77)  $E = 0,01 \sin(1000(t - \frac{x}{1000}))$

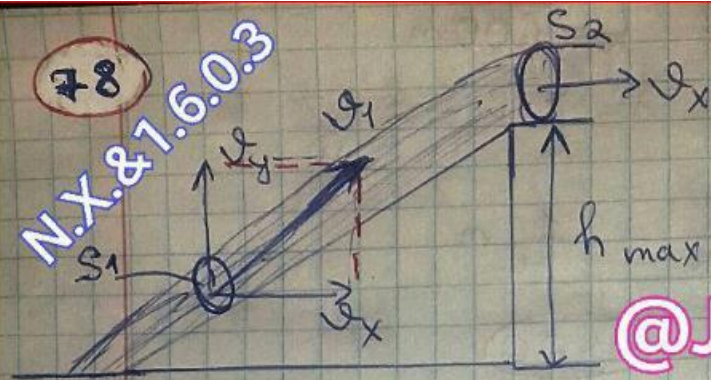
$$k = 1$$

$$\lambda = \frac{2\pi}{k} = \frac{2\pi}{1} = 2\pi \text{ m}$$

N.X.&1.6.0.3

78

N.X.&1.6.0.3



$$h_{max} = \frac{v_y^2}{2g}$$

$$h_{max} = \frac{(30 \text{ m/s})^2}{2 \cdot 10 \text{ m/s}^2} = 45 \text{ m}$$

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Demak suu yuqoriga chiqqanida  
 oqish terligi  $v_x = 1 \text{ m/s}$  ga teng  
 boladi.

$$S_1 \cdot v_1 = S_2 \cdot v_2$$

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 N.X.&1.6.0.3

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$$\frac{\pi d_1^2}{4} \cdot \sqrt{v_x^2 + v_y^2} = \frac{\pi d_2^2}{4} \cdot v_x$$

$$d_1 \cdot \sqrt{v_x^2 + v_y^2} = d_2 \cdot v_x$$

$$d_1 \cdot \sqrt{\frac{v_x^2 + v_y^2}{v_x^2}} = d_2$$

$$d_2 = \sqrt{\frac{v_x^2 + v_y^2}{v_x^2}} \cdot d_1 = \sqrt{1 + \left(\frac{v_y}{v_x}\right)^2} \cdot d_1$$

$$d_2 = \sqrt{1 + \left(\frac{30 \text{ m/s}}{1 \text{ m/s}}\right)^2} \cdot 2 \text{ cm} = 11 \text{ cm}$$

N.X.&1.6.0.3

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78 sharti bilan bir xil

$$d_2 = \sqrt{1 + \left(\frac{v_y}{v_x}\right)^2} \cdot d_1 = \sqrt{1 + \left(\frac{30}{1}\right)^2} \cdot 1 \text{ cm} = 5,5 \text{ cm}$$

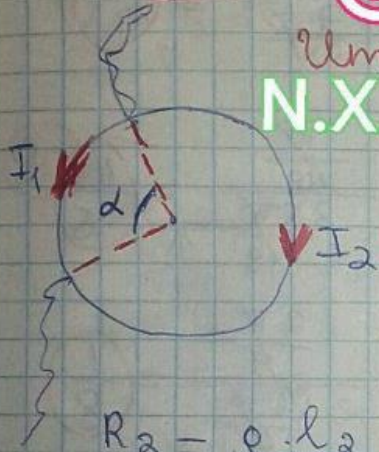
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$$\textcircled{80} \quad d_2 = \sqrt{1 + \left(\frac{v_y}{v_x}\right)^2} \Rightarrow d_1 = \sqrt{1 + \left(\frac{30}{1}\right)^2} \cdot 3 \text{ km} \\ = 16,4 \text{ km} \quad \textcircled{\text{@Janob\_Fiziklar}}$$

$$\textcircled{81} \quad d_2 = \sqrt{1 + \left(\frac{v_y}{v_x}\right)^2} \cdot d_1 = \sqrt{1 + \left(\frac{30}{1}\right)^2} \cdot 4 \text{ km} = \\ = 22 \text{ km} \quad \textcircled{\text{@Janob\_Fiziklar}}$$

Umumiy qoidacha (82-87)  
N.X.&1.6.0.3



$l_1 = d \cdot R$        $R_1 = \frac{\rho \cdot l_1}{S} = \frac{\rho \cdot d \cdot R}{S}$   
 $\textcircled{\text{@Janob\_Fiziklar}}$

$$l_2 = 2\pi R - d \cdot R = (2\pi - d) \cdot R$$

$$R_2 = \frac{\rho \cdot l_2}{S} = \frac{\rho \cdot (2\pi - d) \cdot R}{S}$$

N.X.&1.6.0.3

$$I_1 = \frac{U}{R_1} \quad I_2 = \frac{U}{R_2} \quad \Rightarrow \quad \frac{I_2}{I_1} = \frac{\frac{U}{R_2}}{\frac{U}{R_1}} = \frac{R_1}{R_2}$$

$$\frac{I_2}{I_1} = \frac{\frac{\rho \cdot l_1}{S}}{\frac{\rho \cdot l_2}{S}} = \frac{l_1}{l_2} = \frac{d \cdot R}{(2\pi - d) \cdot R} = \frac{d}{2\pi - d}$$

$\textcircled{\text{@Janob\_Fiziklar}}$

$$\textcircled{82} \quad \frac{I_2}{I_1} = \frac{\frac{\pi}{3}}{2\pi - \frac{\pi}{3}} = \frac{\frac{\pi}{3}}{\frac{5\pi}{3}} = \frac{1}{5}$$

N.X.&1.6.0.3

83  $\frac{I_2}{I_1} = \frac{d}{2\pi - d} = \frac{\frac{\pi}{2}}{2\pi - \frac{\pi}{2}} = \frac{\frac{\pi}{2}}{\frac{3\pi}{2}} = \frac{1}{3}$

N.X.&1.6.0.3

←  
isboti  
bu  
setda

84  $\frac{I_2}{I_1} = \frac{d}{2\pi - d} = \frac{\frac{\pi}{6}}{2\pi - \frac{\pi}{6}} = \frac{\frac{\pi}{6}}{\frac{11\pi}{6}} = \frac{1}{11}$

@Janob\_Fiziklar

85  $\frac{I_2}{I_1} = \frac{d}{2\pi - d} = \frac{\frac{\pi}{4}}{2\pi - \frac{\pi}{4}} = \frac{\frac{\pi}{4}}{\frac{7\pi}{4}} = \frac{1}{7}$

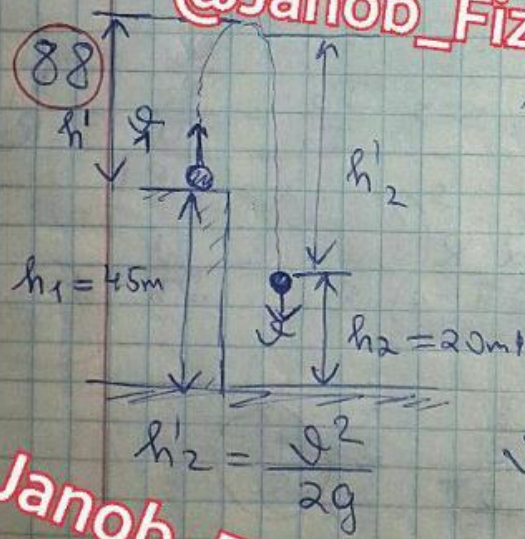
N.X.&1.6.0.3

86  $\frac{I_2}{I_1} = \frac{d}{2\pi - d} = \frac{\frac{10 \cdot \pi}{180}}{2\pi - \frac{10 \cdot \pi}{180}} = \frac{\frac{\pi}{18}}{\frac{35\pi}{18}} = \frac{1}{35}$

@Janob\_Fiziklar

87  $\frac{I_2}{I_1} = \frac{d}{2\pi - d} = \frac{\frac{2\pi}{9}}{2\pi - \frac{2\pi}{9}} = \frac{\frac{2\pi}{9}}{\frac{16\pi}{9}} = \frac{1}{8}$

@Janob\_Fiziklar



$h' = \frac{v_1^2}{2g} = \frac{(20 \text{ m/s})^2}{2 \cdot 10 \text{ m/s}^2} = 20 \text{ m}$

N.X.&1.6.0.3

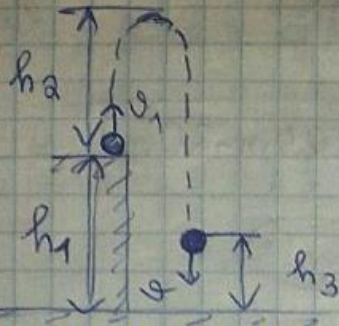
$H = 45 \text{ m} + 20 \text{ m} = 65 \text{ m}$

$h'_2 = H - h_2 = 65 - 20 = 45 \text{ m}$

$v = \sqrt{2gh'_2} = \sqrt{2 \cdot 10 \frac{\text{m}}{\text{s}^2} \cdot 45 \text{ m}} = 30 \text{ m/s}$

@Janob\_Fiziklar

89



$$h_1 = 30 \text{ m}$$

$$h_2 = \frac{v_1^2}{2g} = \frac{(20 \text{ m/s})^2}{2 \cdot 10 \text{ m/s}^2} = 20 \text{ m}$$

$$H = h_1 + h_2 = 30 \text{ m} + 20 \text{ m} = 50 \text{ m}$$

N.X.&.1.6.0.3

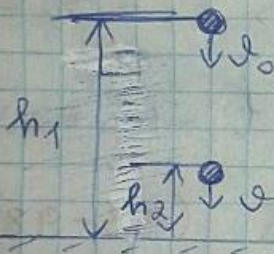
$$H - h_3 = \frac{v^2}{2g}$$

$$v = \sqrt{2g(H - h_3)}$$

$$v = \sqrt{2 \cdot 10 \frac{\text{m}}{\text{s}^2} \cdot (50 \text{ m} - 10 \text{ m})} = \sqrt{20 \cdot 40} = 20\sqrt{2} \frac{\text{m}}{\text{s}}$$

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90



$$h_1 - h_2 = \frac{v^2 - v_0^2}{2g}$$

$$v = \sqrt{v_0^2 + 2g(h_1 - h_2)}$$

N.X.&.1.6.0.3

$$v = \sqrt{(10 \text{ m/s})^2 + 2 \cdot 10 \text{ m/s}^2 \cdot (45 \text{ m} - 5 \text{ m})}$$

$$= \sqrt{100 + 20 \cdot 40} = 30 \text{ m/s}$$

@Janob\_Fiziklar

91

↑ chizma shunday

$$v = \sqrt{v_0^2 + 2g(h_1 - h_2)}$$

$$v = \sqrt{(10 \text{ m/s})^2 + 2 \cdot 10 \frac{\text{m}}{\text{s}^2} \cdot (80 \text{ m} - 20 \text{ m})}$$

$$= \sqrt{100 \frac{\text{m}^2}{\text{s}^2} + 20 \cdot 60 \frac{\text{m}^2}{\text{s}^2}} = \sqrt{1300 \frac{\text{m}^2}{\text{s}^2}} = 10\sqrt{13} \frac{\text{m}}{\text{s}}$$

N.X.&.1.6.0.3

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92

$$v = \sqrt{v_0^2 + 2g(h_1 - h_2)}$$

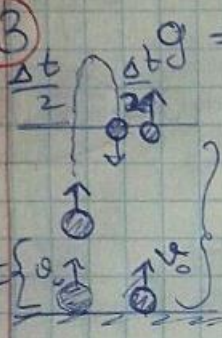
$$v = \sqrt{(15 \text{ m/s})^2 + 2 \cdot 10 \text{ m/s}^2 \cdot (105 \text{ m} - 20 \text{ m})} =$$

$$= \sqrt{225 + 20 \cdot 85} = \sqrt{1925} \approx 44 \text{ m/s}$$

N.X.&1.6.0.3

@Janob\_Fiziklar

93



$$g = \frac{5 \text{ m/s}^2}{3}$$

$$\Delta t = 2 \text{ s}$$

$$t_k = \frac{v_0}{g} = \frac{20 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} = 12 \text{ s}$$

$$t_k = \frac{\Delta t}{2} + t_1' \Rightarrow t_1' = t_k - \frac{\Delta t}{2}$$

$$t_1' = 12 \text{ s} - \frac{2 \text{ s}}{2} = 11 \text{ s}$$

$$t_1 = 11 \text{ s} + 2 \text{ s} = 13 \text{ s}$$



Umumiy qoida (93-98)

$$v_1 = v_2$$

$$gt_1 - v_0 = v_0 - g(t_1 - \Delta t)$$

$$gt_1 - v_0 = v_0 - gt_1 + g\Delta t$$

$$2gt_1 = 2v_0 + g\Delta t$$

$$t_1 = \frac{2v_0 + g\Delta t}{2g} = \frac{v_0}{g} + \frac{\Delta t}{2}$$

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N.X.&1.6.0.3

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N.X.&1.6.0.3

$$v_1 = v_2$$

$$v_0 - gt_2 = g(t_2 + \Delta t) - v_0$$

$$v_0 - gt_2 = gt_2 + g\Delta t - v_0$$

$$2v_0 = 2gt_2 + g\Delta t$$

$$t_2 = \frac{2v_0 - g\Delta t}{2g} = \frac{v_0}{g} - \frac{\Delta t}{2}$$

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ikkinchi jism atilgandan keyin o'zgarish vaqt

93) ikkinchi usul N.X.&1.6.0.3

$$t_1 = \frac{v_0}{g} + \frac{\Delta t}{2} = \frac{20 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} + \frac{2 \text{ s}}{2} = 13 \text{ s}$$

$$94) t_2 = \frac{v_0}{g} - \frac{\Delta t}{2} = \frac{20 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} - \frac{2 \text{ s}}{2} = 11 \text{ s}$$

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$$95) t_2 = \frac{v_0}{g} - \frac{\Delta t}{2} = \frac{10 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} - \frac{2 \text{ s}}{2} = 6 - 1 = 5 \text{ s}$$

$$96) t_1 = \frac{v_0}{g} + \frac{\Delta t}{2} = \frac{10 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} + \frac{2 \text{ s}}{2} = 7 \text{ s}$$

@Janob\_Fiziklar

$$97) t_1 = \frac{v_0}{g} + \frac{\Delta t}{2} = \frac{10 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} + \frac{4 \text{ s}}{2} = 8 \text{ s}$$

N.X.&1.6.0.3

$$98) t_2 = \frac{v_0}{g} - \frac{\Delta t}{2} = \frac{10 \text{ m/s}}{\frac{5 \text{ m/s}^2}{3}} - \frac{4 \text{ s}}{2} = 6 - 2 = 4 \text{ s}$$

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N.X.&1.6.0.3

99

$$g = \frac{GM}{R^2}$$

$$M_1 = M_2$$

$$R_1 = 2R_2$$

$$\frac{g_1}{g_2} = \frac{\frac{GM}{R_1^2}}{\frac{GM}{R_2^2}} = \frac{R_2^2}{R_1^2} = \left(\frac{R_2}{R_1}\right)^2 = \left(\frac{R_2}{2R_2}\right)^2 = \frac{1}{4}$$

4 marta farq qiladi  
N.X.&1.6.0.3

100

$$M_1 = 2M_2$$

$$R_1 = R_2$$

$$\frac{g_1}{g_2} = \frac{\frac{GM_1}{R_1^2}}{\frac{GM_2}{R_2^2}} = \frac{M_1}{M_2} = \frac{2M_2}{M_2} = 2$$

shart berilishi kerak

2 marta farq qiladi

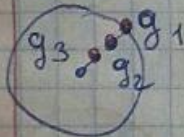
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101

$$g_h = g_0 \cdot \left(\frac{R-h}{R}\right) \Rightarrow h \text{ chuqurlikdagi erkin tushish tezlanishi}$$

N.X.&1.6.0.3

Chuqurlik ortgan sari  $g_h$  erkin tushish tezlanishi kamayadi

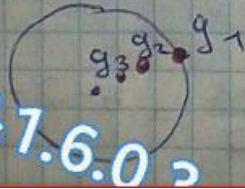


$$g_1 > g_2 > g_3$$

kamayib boradi

102

formulasi @Janob\_Fiziklar



$$g_3 < g_2 < g_1$$

ortib boradi

N.X.&1.6.0.3

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103  $g_h = g_0 \left( \frac{R-h}{R} \right) \Rightarrow h$  chuqurlikdagi erkin tushish tezlanishi

$h = R$  = bolsa,  $g_h = g_0 \frac{(R-R)}{R} = 0$

104  $g_h = g_0 \left( \frac{R-h}{R} \right)$   
**N.X.&1.6.0.3**

$h = R$  chuqurlik yerning markazi b'oladi

$g_h = g_0 \frac{(R-R)}{R} = 0$

**N.X.&1.6.0.3**

**@Janob\_Fiziklar**

105  $g_h = g_0 \left( \frac{R-h}{R} \right)$

$h = \frac{R}{2}$

$g_h = g_0 \cdot \frac{(R - \frac{R}{2})}{R} = \frac{g_0 \cdot \frac{R}{2}}{R} = \frac{g_0}{2} = \frac{g}{2}$

106  $g_h = g_0 \cdot \left( \frac{R-h}{R} \right)$

$h = \frac{R}{4}$

$g_h = \frac{g \cdot (R - \frac{R}{4})}{R} = \frac{g \cdot \frac{3R}{4}}{R} = \frac{3g}{4}$

**@Janob\_Fiziklar**

107  $g_h = g_0 \cdot \left( \frac{R-h}{R} \right)$

$g_h = \frac{g \cdot (R - \frac{3R}{4})}{R} = \frac{g \cdot \frac{R}{4}}{R} = \frac{g}{4}$

108  $\Delta h = \frac{g}{2} (2t-1) \Rightarrow \frac{5H}{g} = \frac{g}{2} (2t-1)$

**@Janob\_Fiziklar** **N.X.&1.6.0.3**

**@Janob\_Fiziklar**

$$\frac{5H}{g} = \frac{g}{2}(2t-1) \Rightarrow H = \frac{gt^2}{2}$$

$$\frac{5}{g} \cdot \frac{gt^2}{2} = \frac{g}{2} \cdot (2t-1) \Rightarrow \frac{5}{g}t^2 - 2t + 1 = 0$$

$$\Delta = (-2)^2 - 4 \cdot \frac{5}{g} \cdot 1 = 4 - 4 \cdot \frac{5}{g} = \frac{4 \cdot 4}{g} = \frac{16}{g}$$

$$t_1 = \frac{2 + \frac{4}{3}}{2 \cdot \frac{5}{g}} = \frac{\frac{10}{3}}{\frac{10}{g}} = 3s$$

$$t_2 = \frac{2 - \frac{4}{3}}{2 \cdot \frac{5}{g}} = \frac{\frac{2}{3}}{\frac{10}{g}} = \frac{2}{5} = 0,6s$$

$$H_1 = \frac{gt_1^2}{2} = \frac{10 \text{ m/s}^2 \cdot (3s)^2}{2} = 45 \text{ m}$$

$$H_2 = \frac{gt_2^2}{2} = \frac{10 \text{ m/s}^2 \cdot (0,6s)^2}{2} = 1,8 \text{ m}$$

109

$$Ah = \frac{g}{2} \cdot (2t-1)$$

$$\frac{gH}{25} = \frac{g}{2}(2t-1)$$

$$H = \frac{gt^2}{2}$$

$$\frac{g}{25} \cdot \frac{gt^2}{2} = \frac{g}{2}(2t-1) \Rightarrow \frac{gt^2}{25} = 2t-1$$

$$\frac{gt^2}{25} - 2t + 1 = 0$$

$$gt^2 - 50t + 25 = 0$$

$$\Delta = (-50)^2 - 4 \cdot g \cdot 25 = 2500 - 900 = 1600$$

N.X.&1.6.0.3

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N.X.&1.6.0.3

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N.X.&1.6.0.3

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$$t_1 = \frac{50+40}{2 \cdot 9} = \frac{90}{2 \cdot 9} = 5 \text{ s}$$

$$t_2 = \frac{50-40}{2 \cdot 9} = \frac{10}{2 \cdot 9} = \frac{5}{9} \text{ s}$$

$$H_1 = \frac{g t_1^2}{2} = \frac{10 \text{ m/s}^2 \cdot (5 \text{ s})^2}{2} = 125 \text{ m}$$

$$H_2 = \frac{g t_2^2}{2} = \frac{10 \text{ m/s}^2 \cdot (\frac{5}{9} \text{ s})^2}{2} = \frac{125}{81} \text{ m}$$

$$\textcircled{110} \quad \Delta h = \frac{g}{2} (2t-1) \quad \frac{99H}{2500} = \frac{g}{2} (2t-1)$$

$$H = \frac{g t^2}{2} \quad \frac{99}{2500} \cdot \frac{g t^2}{2} = \frac{g}{2} (2t-1)$$

$$\frac{99}{2500} t^2 - 2t + 1 = 0 \Rightarrow 99t^2 - 5000t + 2500 = 0$$

$$D = (-5000)^2 - 4 \cdot 99 \cdot 2500 = 25000000 -$$

$$- 990000 \quad 24010000 \quad \text{N.X. \& 1.6.0.3}$$

$$t_1 = \frac{5000 + 4900}{2 \cdot 99} = \frac{9900}{2 \cdot 99} = 50 \text{ s}$$

N.X. & 1.6.0.3

$$t_2 = \frac{5000 - 4900}{2 \cdot 99} = \frac{100}{2 \cdot 99} = \frac{50}{99} \text{ s}$$

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$$H = \frac{g t_1^2}{2} = \frac{10 \frac{\text{m}}{\text{s}^2} (50 \text{ s})^2}{2} = 5 \frac{\text{m}}{\text{s}^2} \cdot 2500 \text{ s}^2$$

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$$= 12500 \text{ m} = 12.5 \text{ km}$$

$$\textcircled{111} \quad \left[ \Delta h = \frac{g}{2} (2t-1) \right] \Rightarrow \frac{7H}{g} = \frac{g}{2} (2t-1)$$

$$\frac{7}{g} \cdot \frac{gt^2}{2} = \frac{g}{2} \cdot (2t-1) \Rightarrow \frac{7}{g} t^2 = 2t-1$$

@Janob\_Fiziklar

$$7t^2 - 18t + 9 = 0 \quad D = 324 - 4 \cdot 7 \cdot 9 = 72$$

$$t_1 = \frac{18 + \sqrt{72}}{2} \approx 13,2 \text{ s} \quad t_2 = \frac{18 - \sqrt{72}}{2} \approx 4,76 \text{ s}$$

$$H_1 = \frac{gt_1^2}{2} = \frac{10 \text{ m/s}^2 \cdot (13,2 \text{ s})^2}{2} \approx 66,2 \text{ m}$$

$$H_2 = \frac{gt_2^2}{2} = \frac{10 \text{ m/s}^2 \cdot (4,76 \text{ s})^2}{2} \approx 113 \text{ m}$$

Umumiy qoida (112-124)

112  $L = m v r$

yoki  $L = n \hbar$

$$\frac{L_1}{L_2} = \frac{\frac{n_1 \hbar}{r_1}}{\frac{n_2 \hbar}{r_2}} = \frac{n_1}{n_2} = \frac{1}{3}$$

@Janob\_Fiziklar

$$E_n = \frac{E_1}{n^2}$$

$$\frac{E_1}{E_n} =$$

$$\frac{\frac{E_1}{n_1^2}}{\frac{E_1}{n_2^2}} = \left(\frac{n_2}{n_1}\right)^2 = 3^2 = 9$$

@Janob\_Fiziklar

113  $\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 \Rightarrow$

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{2}{3}$$

$$\frac{E_1}{E_2} = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

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N.X.&1.6.0.3

114

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 \Rightarrow$$

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{1}{6}$$

$$\frac{E_1}{E_2} = \left(\frac{6}{1}\right)^2 = 36$$

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N.X.&1.6.0.3

115

$$L = m v r$$

$$\frac{L_1}{L_2} = \frac{m v_1 r_1}{m v_2 r_2} = \frac{1}{3}$$

$$\frac{v_1}{v_2} = \frac{1}{3}$$

$$E_k = \frac{m v^2}{2}$$

$$\frac{E_{k1}}{E_{k2}} = \frac{\frac{m v_1^2}{2}}{\frac{m v_2^2}{2}} = \left(\frac{v_1}{v_2}\right)^2 = \left(\frac{1}{3}\right)^2 = \frac{1}{9}$$

116

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2$$

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{1}{2}$$

$$\frac{E_1}{E_2} = 2^2 = 4$$

@Janob\_Fiziklar

117

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{1}{3}$$

$$z = \frac{\epsilon_0 h^2}{\pi \cdot m \ell^2} \cdot n^2$$

$$\frac{z_1}{z_2} = \frac{\frac{\epsilon_0 h^2}{\pi m \ell^2} \cdot n_1^2}{\frac{\epsilon_0 h^2}{\pi m \ell^2} \cdot n_2^2} = \left(\frac{n_1}{n_2}\right)^2 = \left(\frac{1}{3}\right)^2 = \left(\frac{1}{9}\right)$$

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N.X.&1.6.0.3

118

$$\frac{L_1}{L_2} = \frac{2}{3} = \frac{n_1}{n_2}$$

$$z = \frac{\epsilon_0 \cdot h^2}{\pi \cdot m \ell^2} \cdot n^2$$

$$\frac{z_1}{z_2} = \frac{\frac{\epsilon_0 \cdot h^2}{\pi \cdot m \ell^2} \cdot n_1^2}{\frac{\epsilon_0 \cdot h^2}{\pi \cdot m \ell^2} \cdot n_2^2} = \left(\frac{n_1}{n_2}\right)^2 = \left(\frac{2}{3}\right)^2 = \left(\frac{4}{9}\right)$$

N.X.&1.6.0.3

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119

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{4}{9}$$

$$\frac{L_1}{L_2} = \frac{4}{9}$$

$$\frac{z_1}{z_2} = \left(\frac{n_1}{n_2}\right)^2 = \left(\frac{4}{9}\right)^2 = \left(\frac{16}{81}\right)$$

N.X.&1.6.0.3

120

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2$$

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = \frac{1}{4}$$

$$\frac{E_1}{E_2} = 4^2 = 16$$

@Janob\_Fiziklar

N.X.&1.6.0.3

121

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 \Rightarrow \frac{L_1}{L_2} = \frac{n_1}{n_2}$$

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 = \frac{1}{9} \quad \frac{n_2}{n_1} = \frac{1}{3} \Rightarrow \frac{n_1}{n_2} = 3$$

$$\frac{L_1}{L_2} = \frac{n_1}{n_2} = 3$$

@Janob\_Fiziklar

122

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 \quad \frac{\tau_1}{\tau_2} = \left(\frac{n_1}{n_2}\right)^2$$

$$\frac{E_1}{E_2} = \frac{\tau_2}{\tau_1} = \frac{1}{4} \quad \frac{\tau_1}{\tau_2} = 4$$

N.X.&1.6.0.3

123

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 = \frac{\tau_2}{\tau_1} = \frac{1}{9} \quad \frac{\tau_1}{\tau_2} = 9$$

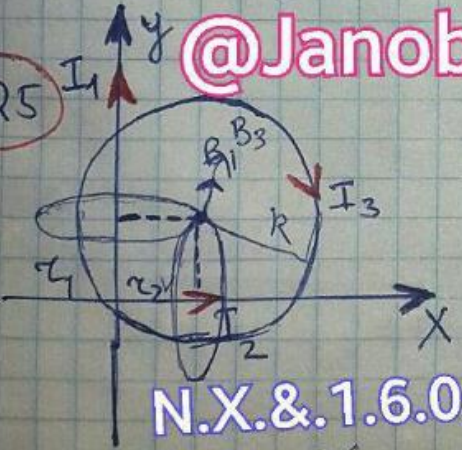
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124

$$\frac{E_1}{E_2} = \left(\frac{n_2}{n_1}\right)^2 = \frac{\tau_2}{\tau_1} = \frac{1}{16} \quad \frac{\tau_1}{\tau_2} = 16$$

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125



$$B_n = B_1 + B_3 - B_2$$

$$B_1 = \frac{\mu \mu_0 I_1}{2\pi r_1} \quad B_2 = \frac{\mu \mu_0 I_2}{2\pi r_2}$$

$$r_1 = r_2 = 0,2 \text{ m} \quad I_1 = I_2$$

$$B_1 = B_2$$

N.X.&1.6.0.3

$$B_n = B_1 + B_3 - B_2 = B_3 = \frac{\mu \mu_0 I_3}{2R} = \frac{4\pi \cdot 10^{-7} \cdot 3}{2 \cdot 0,3} = 2\pi \cdot 10^{-6} \text{ T}$$

@Janob\_Fiziklar

126) 125 bilan chizma bir xil.

$$B_n = B_1 + B_3 - B_2 \quad \text{N.X. \& 1.6.0.3} \quad \mu = 1$$

$$B_1 = \frac{\mu \mu_0 I_1}{2 \cdot 2\pi r_1} \quad B_2 = \frac{\mu \mu_0 I_2}{2\pi r_2} \quad B_3 = \frac{\mu \mu_0 I_3}{2R}$$

$$B_1 = \frac{4\pi \cdot 10^{-7} \cdot 2}{2\pi \cdot 0,2} = 2 \cdot 10^{-6} \text{ T}$$

$$B_2 = \frac{4\pi \cdot 10^{-7} \cdot 4}{2\pi \cdot 0,2} = 4 \cdot 10^{-6} \text{ T}$$

$$B_3 = \frac{4\pi \cdot 10^{-7} \cdot 4}{2 \cdot 0,3} = \frac{80\pi}{3} \cdot 10^{-7} \text{ T}$$

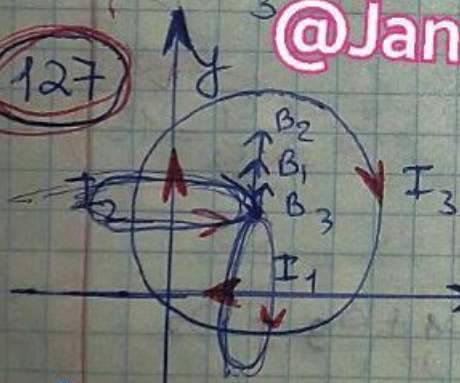
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$$B_n = 2 \cdot 10^{-6} \text{ T} + \frac{80\pi}{3} \cdot 10^{-7} \text{ T} - 4 \cdot 10^{-6} \text{ T} =$$

$$= \frac{80\pi}{3} \cdot 10^{-7} \text{ T} - 2 \cdot 10^{-6} \text{ T} = \left(\frac{8\pi}{3} - 2\right) \cdot 10^{-6} \text{ T}$$

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$$B_{\text{um}} = B_1 + B_2 + B_3$$

$$B_1 = \frac{\mu \mu_0 I_1}{2\pi \cdot r} = \frac{4\pi \cdot 10^{-7} \cdot 1}{2\pi \cdot 0,2} = 10^{-6} \text{ T}$$

$$B_2 = \frac{\mu \mu_0 I_2}{2\pi \cdot r} = \frac{4\pi \cdot 10^{-7} \cdot 4}{2\pi \cdot 0,2} = 4 \cdot 10^{-6} \text{ T}$$

$$B_3 = \frac{\mu \mu_0 I_3}{2 \cdot R} = \frac{4\pi \cdot 10^{-7} \cdot 3}{2 \cdot 0,3} = 2\pi \cdot 10^{-6} \text{ T}$$

N.X. \& 1.6.0.3

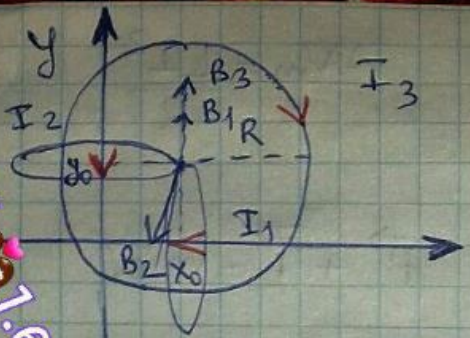
$$B_{\text{um}} = 10^{-6} \text{ T} + 4 \cdot 10^{-6} \text{ T} + 2\pi \cdot 10^{-6} \text{ T} \approx 11 \cdot 10^{-6} \text{ T}$$

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N.X. \& 1.6.0.3

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N.X. 1.6.0.3



$$B_{nat} = B_3 + B_1 - B_2$$

$$y = x_0 = 0,2m$$

$$B_1 = \frac{\mu\mu_0 I_1}{2\pi y_0}$$

$$B_2 = \frac{\mu\mu_0 I_2}{2\pi x_0}$$

$$I_1 = I_2 = 4A$$

$$B_1 = B_2$$

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$$B_{nat} = B_3 + B_1 - B_1 = B_3 = \frac{\mu\mu_0 I_3}{2R}$$

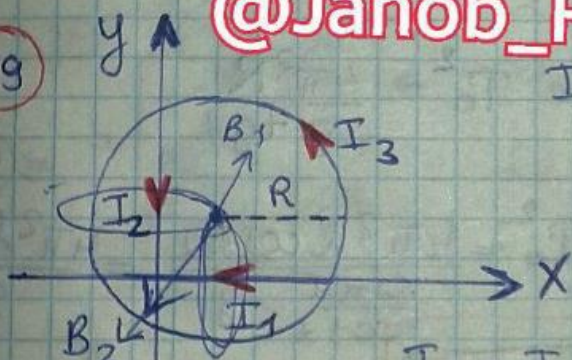
$$B_{nat} = \frac{4\pi \cdot 10^{-7} \cdot 3}{2 \cdot 0,3} = 2\pi \cdot 10^{-6} T$$

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N.X. 1.6.0.3



$$I_1 = 4A$$

$$I_2 = 4A$$

$$I_3 = 3A$$

$$B_{nat} = B_2 + B_3 - B_1$$

$$I_1 = I_2 = 4A$$

$$x_0 = y_0 = 0,2m$$

$$R = 0,3m$$

N.X. 1.6.0.3

$$B_1 = \frac{\mu\mu_0 I_1}{2\pi y_0}$$

$$B_2 = \frac{\mu\mu_0 I_2}{2\pi x_0}$$

$$B_1 = B_2$$

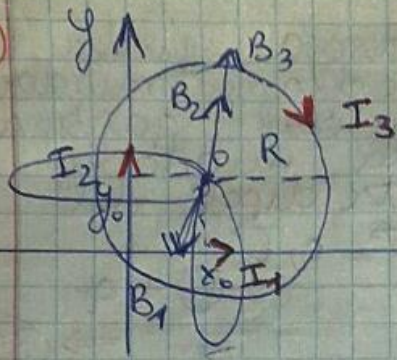
$$B_{nat} = B_2 + B_3 - B_1 = B_3 = \frac{\mu\mu_0 I_3}{2R}$$

$$B_{nat} = \frac{4\pi \cdot 10^{-7} \cdot 3}{2} = 2\pi \cdot 10^{-6} T$$

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$$B_{nat} = B_3 + B_2 - B_1$$

$$B_1 = \frac{\mu_0 I_1}{2\pi R}$$

$$B_2 = \frac{\mu_0 I_2}{2\pi \cdot 2R}$$

$$B_1 = \frac{4\pi \cdot 10^{-7} \cdot 1A}{2\pi \cdot 0,2m} = 10^{-6} T$$

$$B_2 = \frac{4\pi \cdot 10^{-7} \cdot 4A}{2\pi \cdot 0,2m} = 4 \cdot 10^{-6} T$$

$$B_3 = \frac{\mu_0 I_3}{2R} = \frac{4\pi \cdot 10^{-7} \cdot 3}{2 \cdot 0,3} = 2\pi \cdot 10^{-6} T$$

N.X.&1.6.0.3

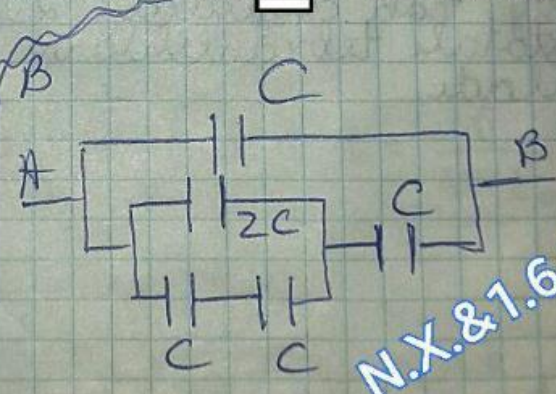
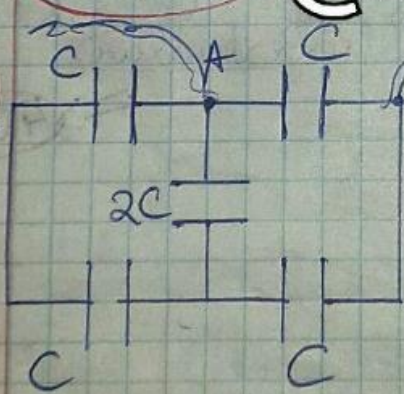
$$B_{nat} = 2\pi \cdot 10^{-6} T + 4 \cdot 10^{-6} T - 1 \cdot 10^{-6} T =$$

$$\approx 9 \cdot 10^{-6} T$$

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N.X.&1.6.0.3



N.X.&1.6.0.3

$$C_{R1} = \frac{C \cdot C}{C + C} = \frac{C}{2} \Rightarrow C_{p1} = \frac{C}{2} + 2C = \frac{5C}{2} = 2,5C$$

$$C_{R2} = \frac{2,5C \cdot C}{C + 2,5C} = \frac{2,5C^2}{3,5C} = \frac{5}{7} C$$



$$C_{AB} = C + \frac{5C}{7} = \frac{12C}{7}$$

N.X.1.6.0.3

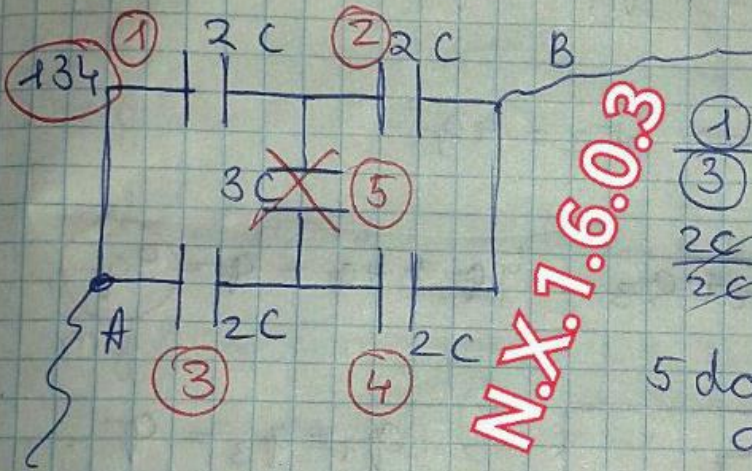
132

$$C_{AB} = \frac{12C}{7} = \frac{12 \cdot 2 \mu F}{7} = \frac{24}{7} \mu F$$

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$$C_{AB} = \frac{12C}{7} = \frac{12 \cdot 5 \mu F}{7} = \frac{60}{7} \mu F$$



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N.X.7.6.0.3

$$\frac{1}{3} = \frac{2}{4} \text{ bolsa,}$$

$$\frac{2C}{2C} = \frac{2C}{2C} \Rightarrow 1=1$$

5 dan zarfadi olmaydi

$$C_{R1} = \frac{2C \cdot 2C}{2C + 2C} = C$$

$$C_{R2} = \frac{2C \cdot 2C}{2C + 2C} = C$$

$$C_{AB} = C_p = C_{R1} + C_{R2} = C + C = 2C$$

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$$C_{AB} = 2C = 2 \cdot 5 \mu F = 10 \mu F$$

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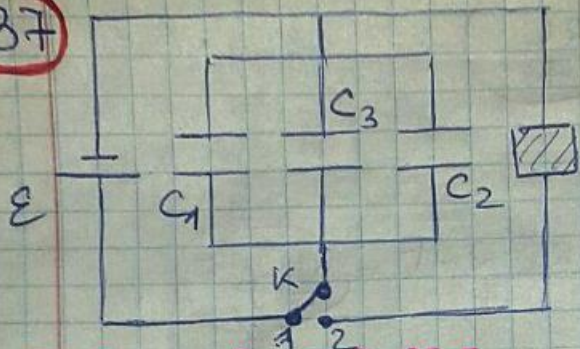
$$C_{AB} = 2C = 2 \cdot 4 \mu F = 8 \mu F$$

N.X.1.6.0.3

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N.X.7.6.0.3

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$C_3 \rightarrow q_3 = q$

$C_1 = 4C_3 = C_2$

$U_1 = U_2 = U_3$

$\frac{q_1}{C_1} = \frac{q_2}{C_2} = \frac{q}{C_3}$

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$\frac{q_1}{4C_3} = \frac{q}{C_3} \Rightarrow q_1 = 4q$

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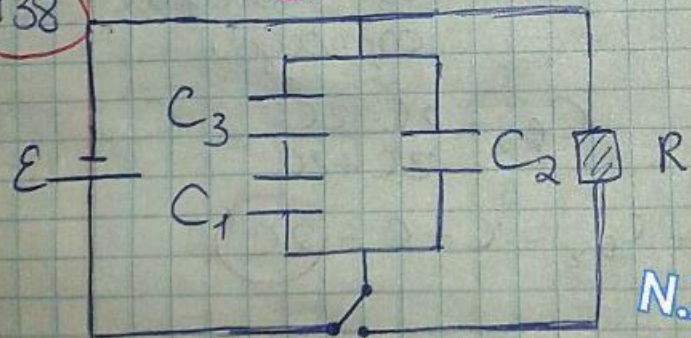
$\frac{q_2}{4C_3} = \frac{q}{C_3} \Rightarrow q_2 = 4q$

N.X.&.1.6.0.3

$q_{\text{sum}} = q_1 + q_2 + q_3 = 4q + 4q + q = 9q$

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$q_1 = q_3 = q$

$U_{1,3} = U_2$

$C_R = \frac{C_1 \cdot C_3}{C_3 + C_1}$

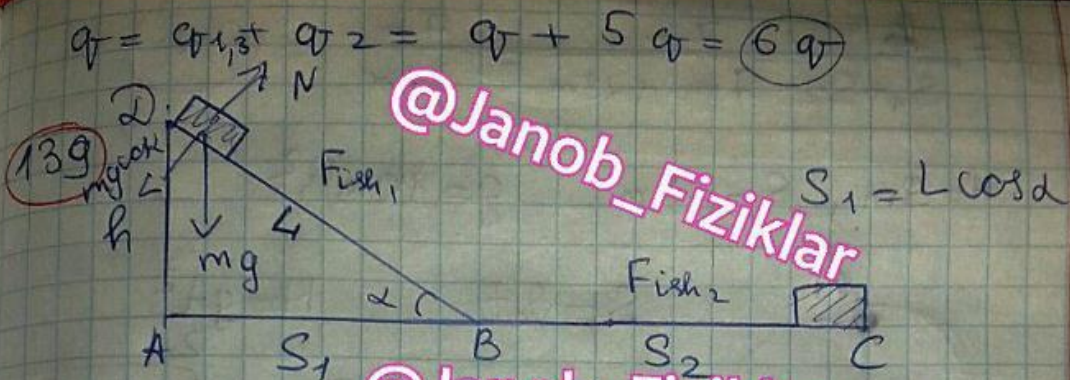
N.X.&.1.6.0.3

$C_1 = 4C_3 = C_2 \Rightarrow C_R = \frac{4C_3 \cdot C_3}{C_3 + 4C_3} = \frac{4C_3^2}{5C_3} = \frac{4C_3}{5}$

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$\frac{q_2}{C_2} = \frac{q}{C_R}$

$q_2 = \frac{q}{\frac{4C_3}{5}} \cdot 4C_3 = 5q$



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N.X.&.1.6.0.3

$E_t = mgh \Rightarrow$  energiyaning hammasi  
 ishqalanish kuchini yengish  
 uchun ish bajaradi

$$mgh = A_1 + A_2 = F_{ish1} \cdot L + F_{ish2} \cdot S_2$$

N.X.&.1.6.0.3

$$N = mg \cos \alpha \quad F_{ish1} = \mu N = \mu mg \cos \alpha$$

$$F_{ish2} = \mu mg$$

$$mgh = \mu mg \cos \alpha \cdot L + \mu mg \cdot S_2 =$$

$$= \mu mg \cdot (S_1 + S_2) \quad @Janob_Fiziklar$$

$$mgh = \mu mg (S_1 + S_2) \Rightarrow \mu = \frac{h}{S_1 + S_2}$$

N.X.&.1.6.0.3

$$\mu = \frac{8m}{10m + 6m} = \frac{8m}{16m} = 0,5$$

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$$\mu = \frac{h}{S_1 + S_2} = \frac{2m}{2m + 8m} = \frac{2m}{10m} = 0,2$$

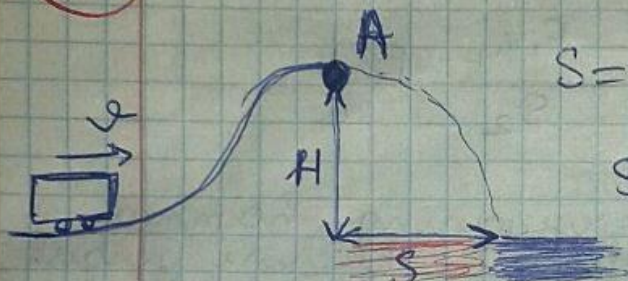
N.X.&.1.6.0.3

141

$$\mu = \frac{h}{S_1 + S_2} = \frac{5m}{5m + 15m} = \frac{5m}{20m} = \frac{1}{4} = 0,25$$

142  $\mu = \frac{h}{S_1 + S_2} = \frac{7m}{7m + 28m} = \frac{7m}{35m} = 0,2$

143  $H = 9m, S = 18m, g = 10m/s^2$



$S = v_0 t$        $H = \frac{gt^2}{2}$   
 $S = v_0 \cdot \sqrt{\frac{2H}{g}} \Rightarrow v_0 = S \cdot \sqrt{\frac{g}{2H}}$

$v_0 = S \cdot \sqrt{\frac{g}{2H}} = 18 \cdot \sqrt{\frac{10}{2 \cdot 9}} = \frac{18\sqrt{5}}{3} = 6\sqrt{5} \frac{m}{s}$

N.X.&1.6.0.3

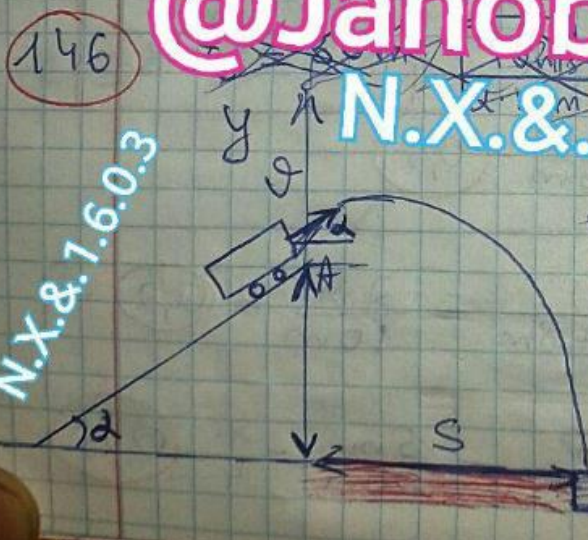
144  $v_0 = S \cdot \sqrt{\frac{g}{2H}} = 50m \cdot \sqrt{\frac{10m/s^2}{2 \cdot 20m}} = \frac{25m}{s}$

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145  $v_0 = S \cdot \sqrt{\frac{g}{2H}} = 20m \cdot \sqrt{\frac{10m/s^2}{2 \cdot 5m}} = \frac{20m}{s}$

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N.X.&1.6.0.3



$y = H + v \sin \alpha \cdot t - \frac{gt^2}{2} \quad \left. \begin{matrix} y=0 \\ x=S \end{matrix} \right\}$   
 $x = v \cos \alpha \cdot t$

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bolsa stadi