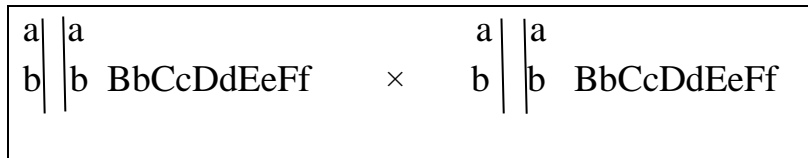


## Xalqaro biologiya olimpiadasi nazorat savollari (qiyinlik darajasi A va B tipda).

1. G.Mendel xushbo'y no'xot o'simligida 7 juft belgining irsiylanishi o'rgangan. O'z o'zidan changlangan xushbo'y no'xot o'simligi belgilarining nazariy jihatdan 2 jufti to'liq birikkan, 3 jufti to'liqsiz dominant, 2 jufti to'liq dominant holda irsiylanadi deb hisoblansa va to'liq birikkan genlar gomozigota retsessiv, qolgan barcha genlar geterozigota holatda bo'lsa, genotipik va fenotipik guruhlar sonining ayirmasini hisoblang?

**Yechish:**



Fenotipik nisbat:  $1(1:2:1) (1:2:1) (1:2:1) (3:1) (3:1) = 1 \times 3 \times 3 \times 3 \times 2 \times 2 = 108$

Genotipik nisbat:  $3^n = 3^5 = 243$

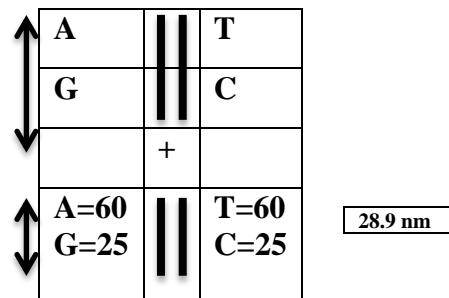
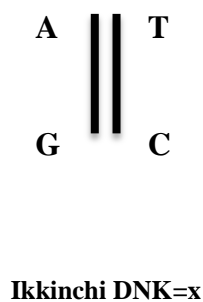
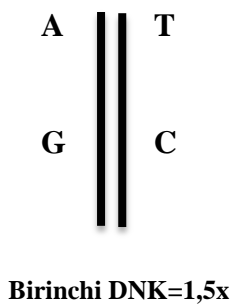
**Javob: 243-108=135**

2. Noma'lum uzunlikdagi ikkita DNK molekulasining ma'lum bir fragmentlari mavjud. Birinchi DNK fragmentining uzunligi ikkinchi DNK fragmenti uzunligida 1,5 marta uzun. Agar ikkinchi DNK fragmentiga 60 ta adenin, 25 ta guanin ligaza fermenti yordamida ulansa, ikkala DNK fragmenti uzunlik jihatdan bir biriga teng bo'lib qoladi. Birinchi DNK fragmentining uzunligini toping?

**Yechish:**

birinchi DNK = 1,5x

ikkinchi DNK = x



$$60+60+25+25=170$$

$$170/2 \cdot 0.34 = 28.9 \text{ nm}$$

$$0.5x = 28.9 \text{ nm}$$

$$1.5x = ? \quad (28.9 \cdot 1.5 / 0.5) = 86.7 \text{ nm}$$

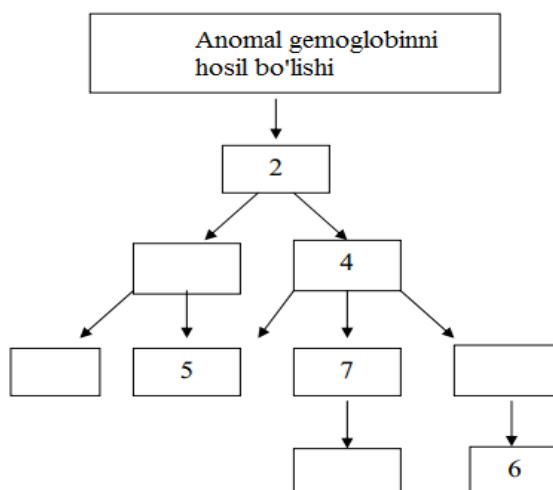
**Javob: 86.7 nm**

**3.** Gemoglobinni (HbS) kodlovchi gendagi mutatsiyalar turli kasalliklarga olib keladi, ulardan biri o'roqsimon anemiya deb ataladi.

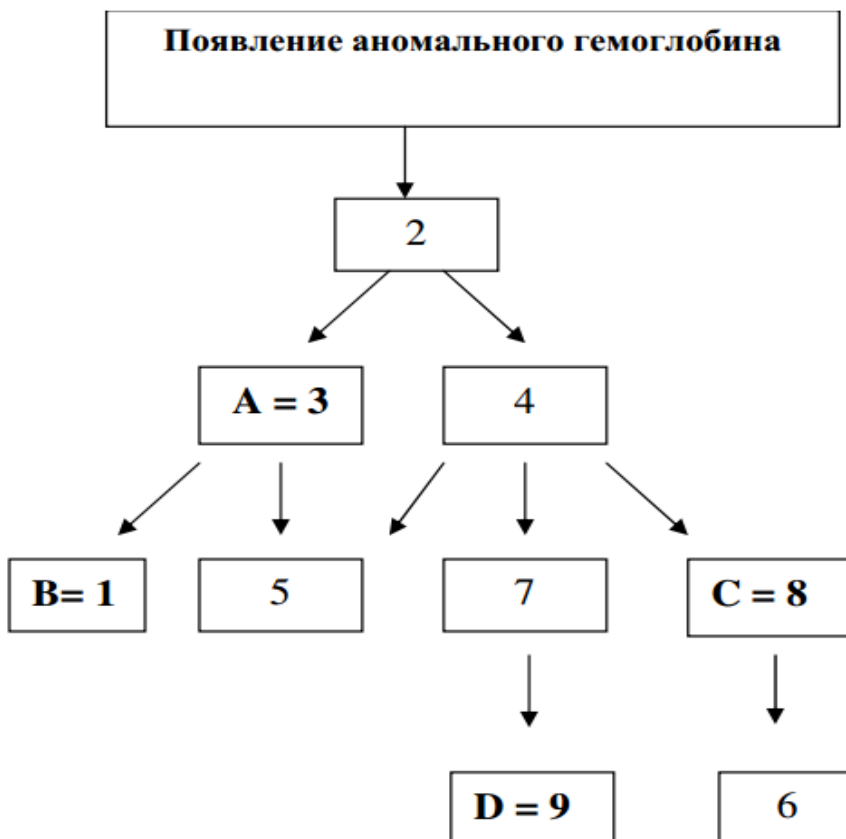
Ushbu kasallikning bir qator alomatlari, xususan:

- 1) Anemiya
- 2) Eritrositlarning o'roqsimon shakli
- 3) Eritrositlar parchalanishi
- 4) Hujayra agregatlarining paydo bo'lishi va mayda qon tomirlarining bloklanishi
- 5) Yurak yetishmovchiligi
- 6) Buyrak yetishmovchiligi
- 7) Bosh miya faoliyatining buzilishi
- 8) Boshqa a'zolarining zararlanishi
- 9) Muskullar falajlanishi

Sxemada, strelka ustidagi alomatlar sababli, strelka ostidagi simptomlar kelib chiqadi. Bo'sh kataklarga yozish orqali sxemani to'ldiring tegishli alomatlar soni. Bosh kataklarga mos keluvchi simptomlarni yozib, sxemani to'ldiring.



**Javob:**



4. Fermada tovuq va quyonlarning oyoqlar soni 64 ta, tovuqlar soni 8 ta bo'lib, umumiy massasi 20 kg (bir xil massali). Quyonlarning umumiy massasi 36 kg bo'lib, ular ham bir xil massali. Bir oy davomida har bir quyon o'z tana massasidan 1,5 barobar, har bir tovuq esa o'z tana massasidan 2 barobar ko'p ovqat yeyishini hisobga olsak, tovuq va quyonlarning chorak qismini yegan bo'rining og'irligi necha kg ga ortadi.

Yechish:

tovuq: 8ta, demak oyoqlari=16ta;  $20/8=2.5\text{kg}$  har bir tovuq  $20*2=40\text{kg}$  umumiy ovqat  $\longrightarrow$

quyon:  $64-16=48$ ;  $48/4=12$ ta quyon;  $36/12=3\text{kg}$  har bir quyon  $36*1.5=54\text{kg}$  umumiy ovqat  $\longrightarrow$

$\longrightarrow 40/8=5\text{kg}$  dan har bir tovuq ovqat iste'mol qildi;  $+0.5\text{kg}$   $8/4=2$ ta;  $2*(2.5\text{kg}+0.5\text{kg})=6$

$\longrightarrow 54/12=4.5\text{kg}$  dan har bir quyon ovqat iste'mol qildi;  $+0.45\text{kg}$   $12/4=3$ ta;  $3*(3\text{kg}+0.45\text{kg})=10.35$

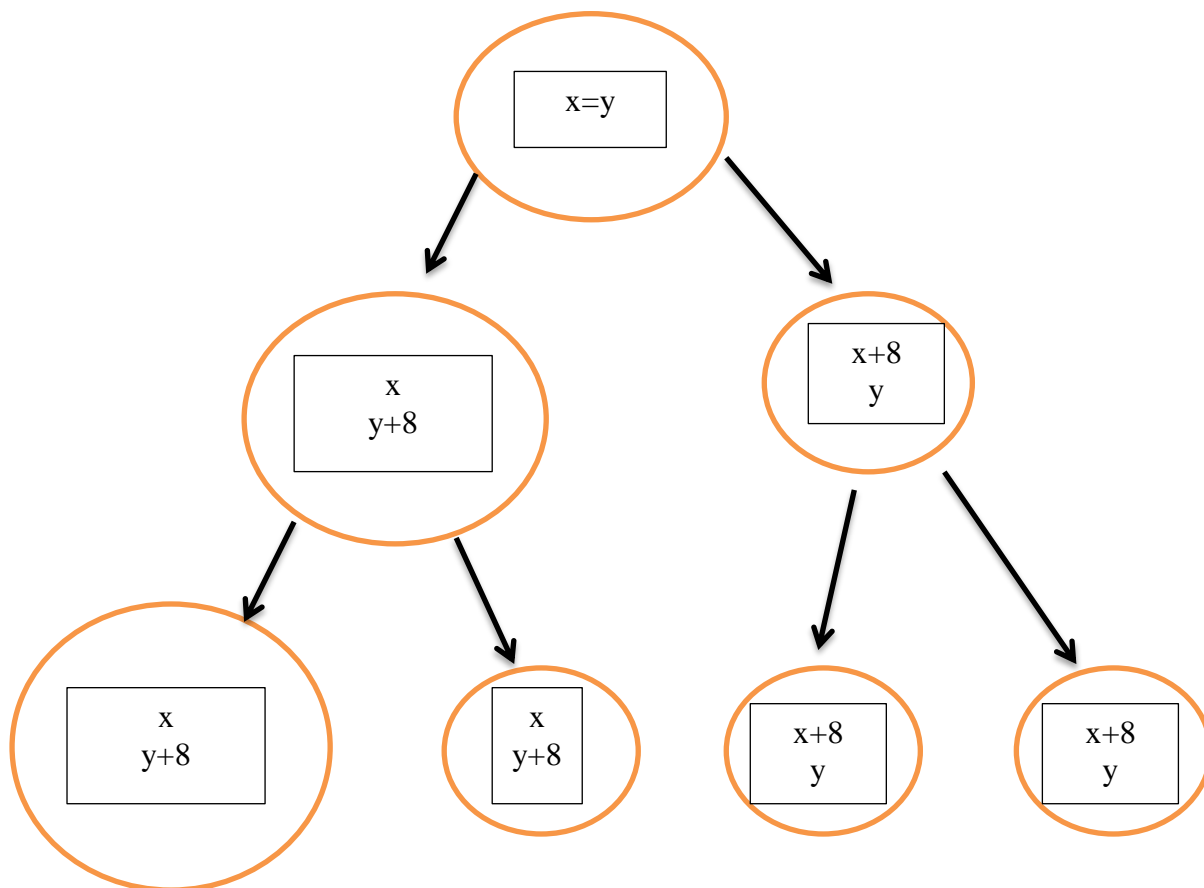
$6+10.35=16.35$  bo'ri tana vazniga  $+1.635\text{ kg}$

**Javob: 1,635 kg**

5. Ma'lum bir organizmni bitta birlamchi jinsiy hujayrasini meyozi I bo'linishidan so'ng yo'naltiruvchi tanachadagi onalik xromosomalar soni ikkinchi hujayradagi onalik xromosomasiga nisbatan 8 ta ko'p bo'lib, shu hujayralarda meyozi tugagandan so'ng jami hosil bo'lgan yo'naltiruvchi tanachalardagi onalik xromosomalar soni 46 tani tashkil etsa, u holda shu birlamchi jinsiy hujayradan hosil bo'lgan tumur hujayradagi ota va onaga tegishli xromosomalar sonini aniqlang.

onalik xromosomasi= $x$

otalik xromosomasi= $y$



barcha yo'naltiruvchi tanachalarda:  $x+x+8+x+8=46$   
 $3x=46-16;$   
 $x=10$

**Javob: 18 otalik xromosomasi va 10 onalik xromosomasi**

**==TAMOM==**

@olimpdep



Fan olimpiadalari bo'yicha  
iqtidorli o'quvchilar bilan ishlash  
**DEPARTAMENTI**