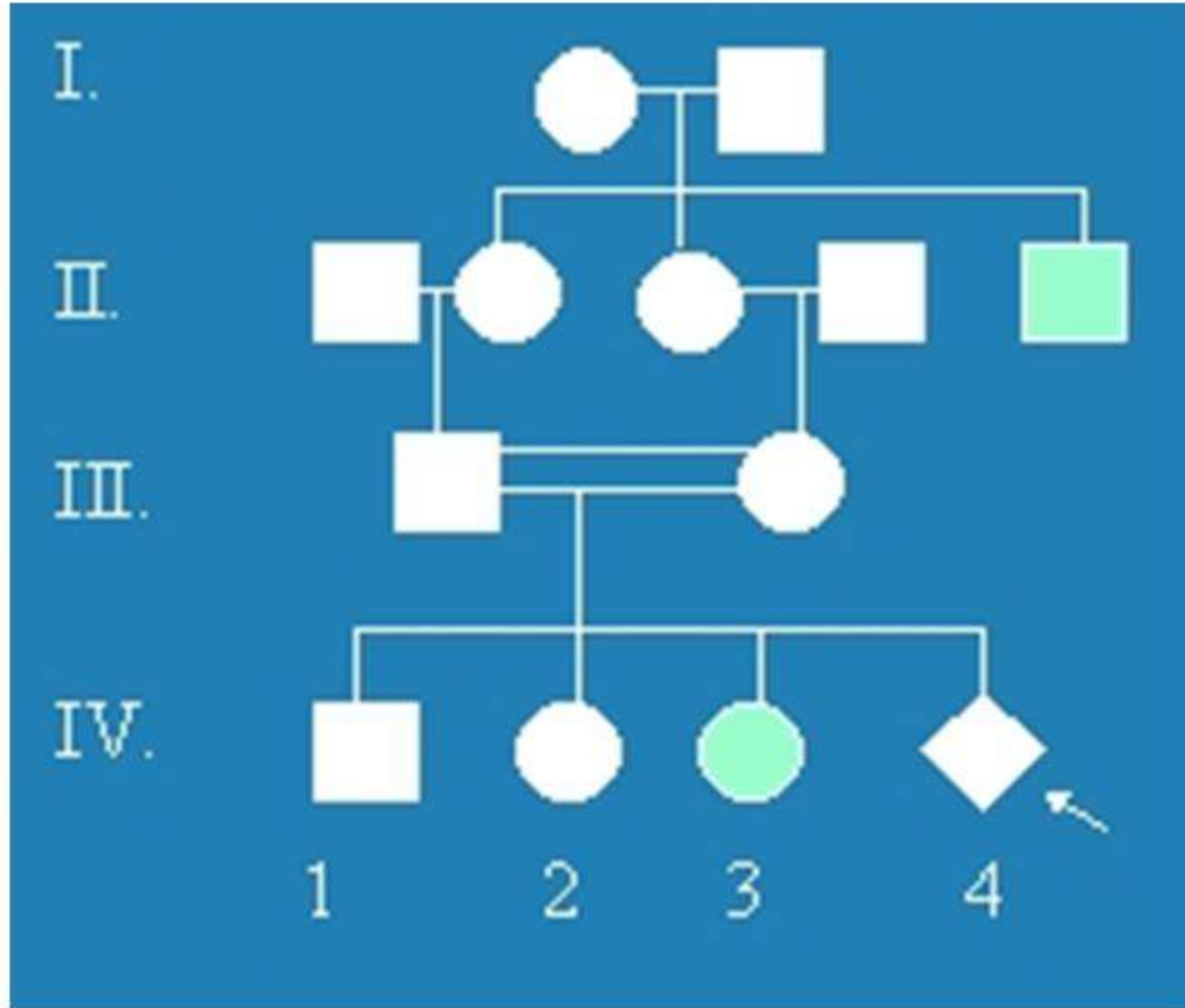


What is the mode of inheritance?

Expected Q:

What is the mode of inheritance?

(same scenario but different pedigrees will show up)



Mode of inheritance:

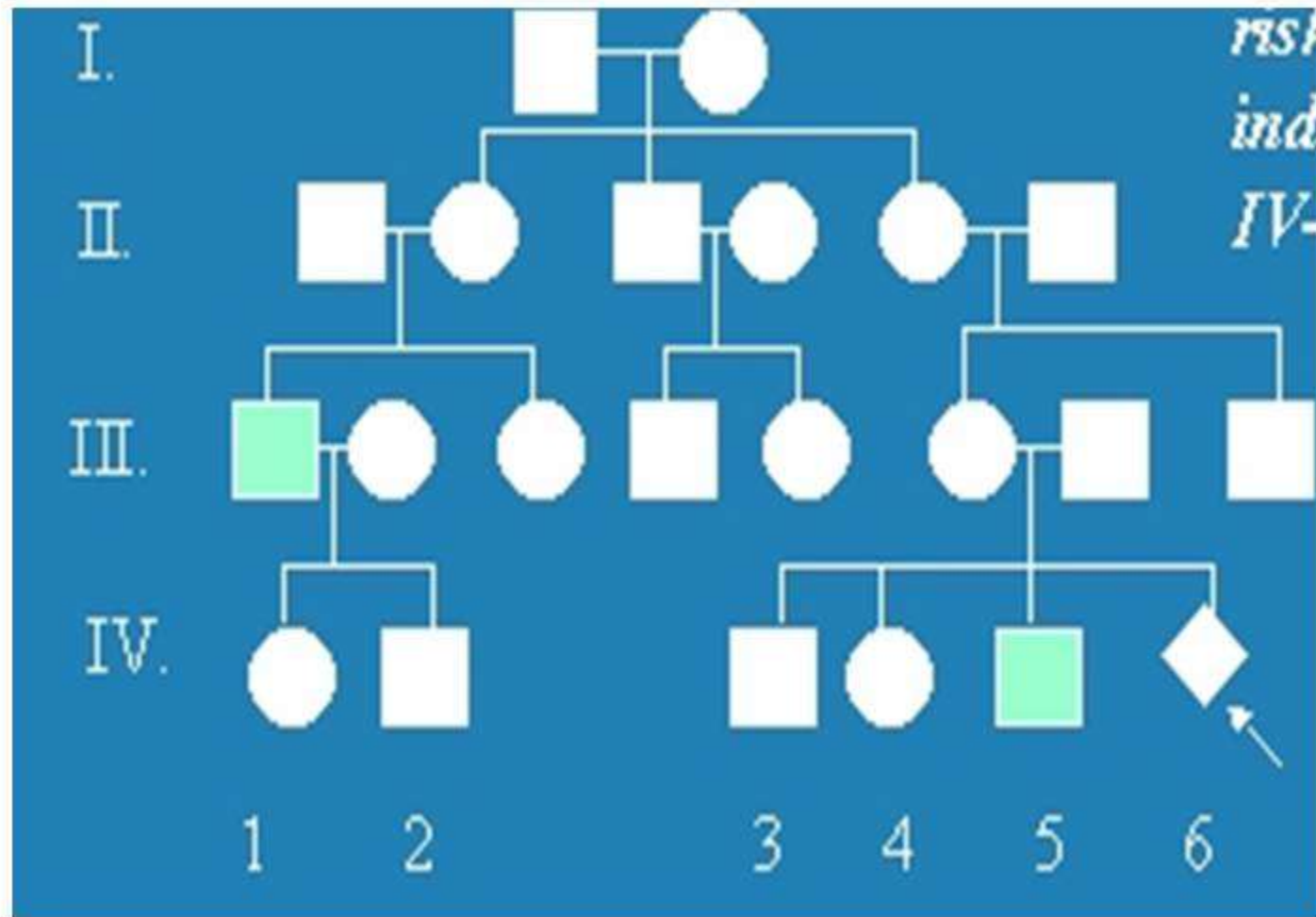
① First of all, we can tell that it is **recessive** bcz:

- a. the disease is skipping generations.
- b. there is consanguinity (زواج اقربى) which enhances the fact that it is recessive.

② the next point: **autosomal recessive OR X-linked recessive?** **autosomal recessive** bcz:

there is nothing that prevents Male #1 from receiving mutant gene from ch.X from a carrier mom, **BUT** looking at female #3 we would expect the father to be affected if it were actually X-linked recessive disease (bcz the father is hemizygous) in other words, if it were actually X-linked recessive the father must be affected in order for the disease to affect the daughter. (if the mom must be heterozygous)

What is the mode of inheritance?



Mode of inheritance:

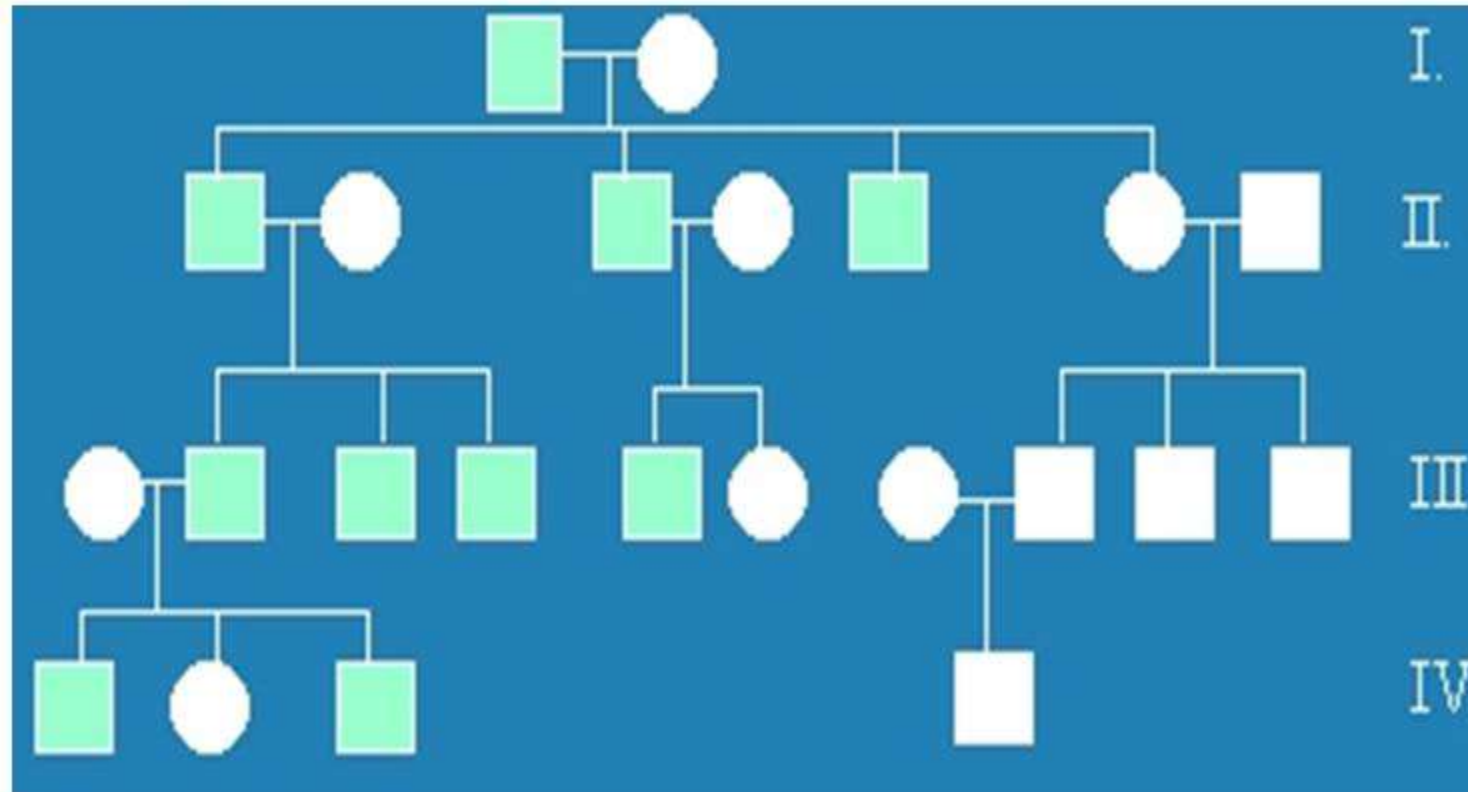
X-linked recessive

- ① it is **recessive** (skips generations)
- ② there are affected males & no affected females which indicates toward **X-linked recessive**. (Male:Female is NOT 1:1)

note:

an accurate question would say "what is the most probable mode of inheritance?" bcz point ② does NOT necessarily rule out "autosomal recessive" (sequencing & genetic testing are used to confirm but there's a higher chance of "X-linked recessive" due to the ratio of Male:Female affected)

What is the mode of inheritance?

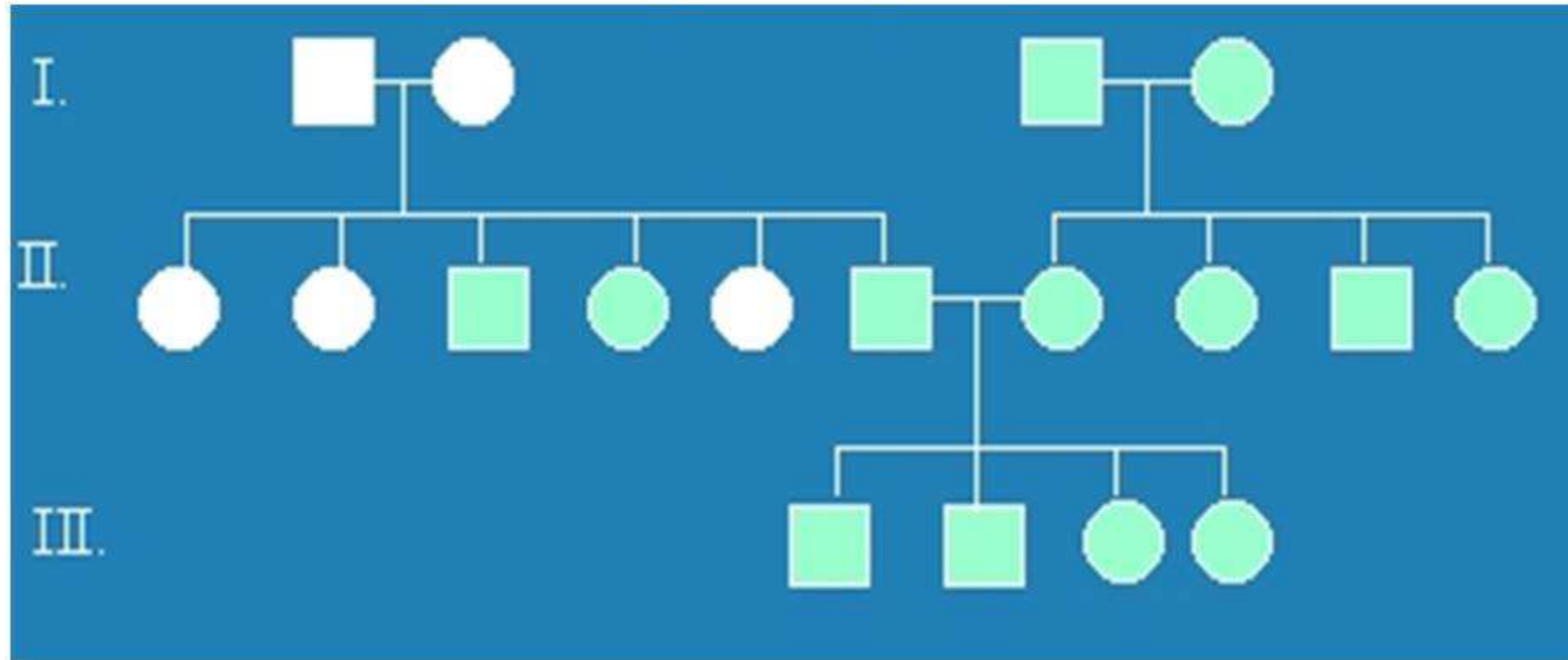


Mode of inheritance:

Y-linked bcz:

- ① only males are affected.
- ② all affected males are from an affected father.

What is the mode of inheritance?

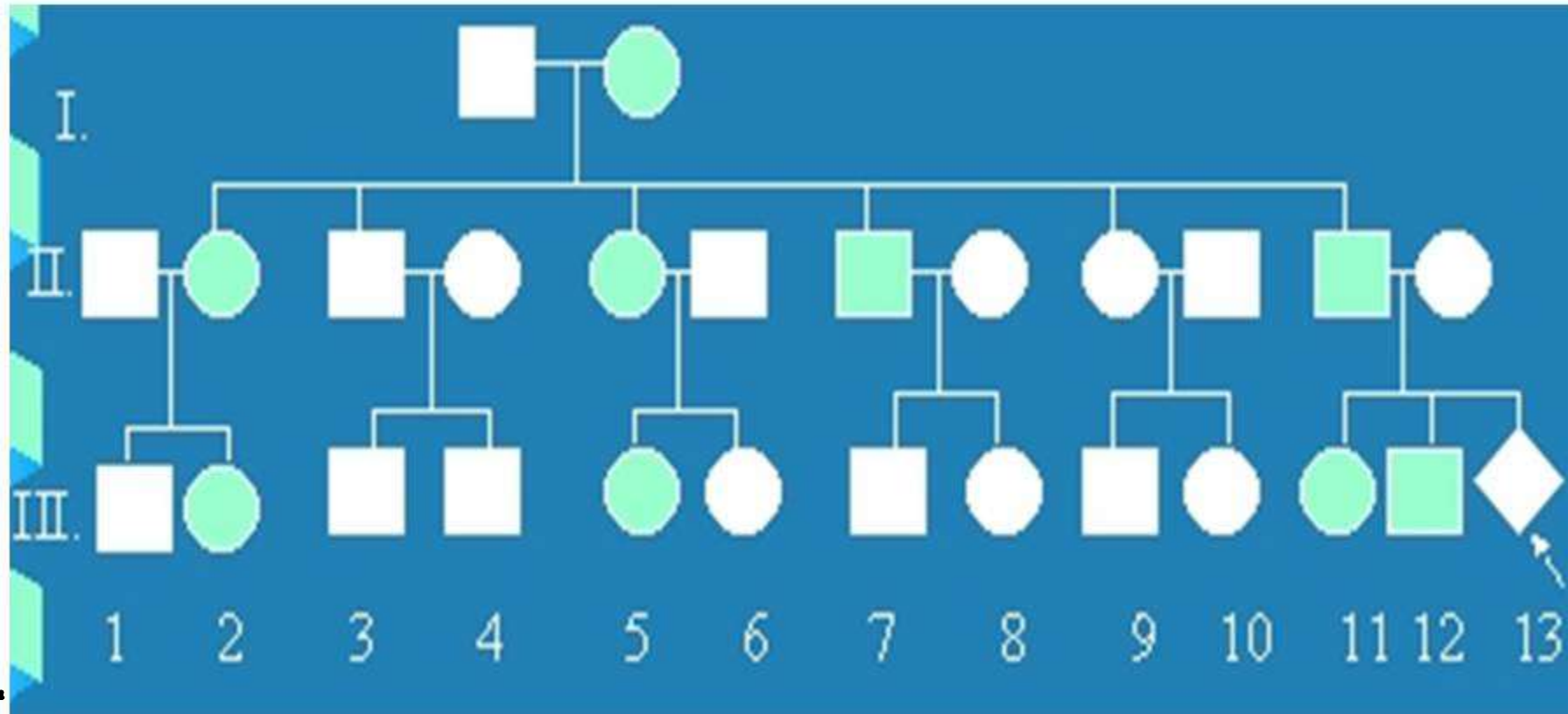


Mode of inheritance:

Autosomal recessive

First impression: vertical transmission
bcz every generation is affected
so we might assume it's dominant
QVI what denies this fact is that
there are unaffected parents who have
>1 affected individuals.
this is **most probably** (not definitely)
an **autosomal recessive** disease.

What is the mode of inheritance?



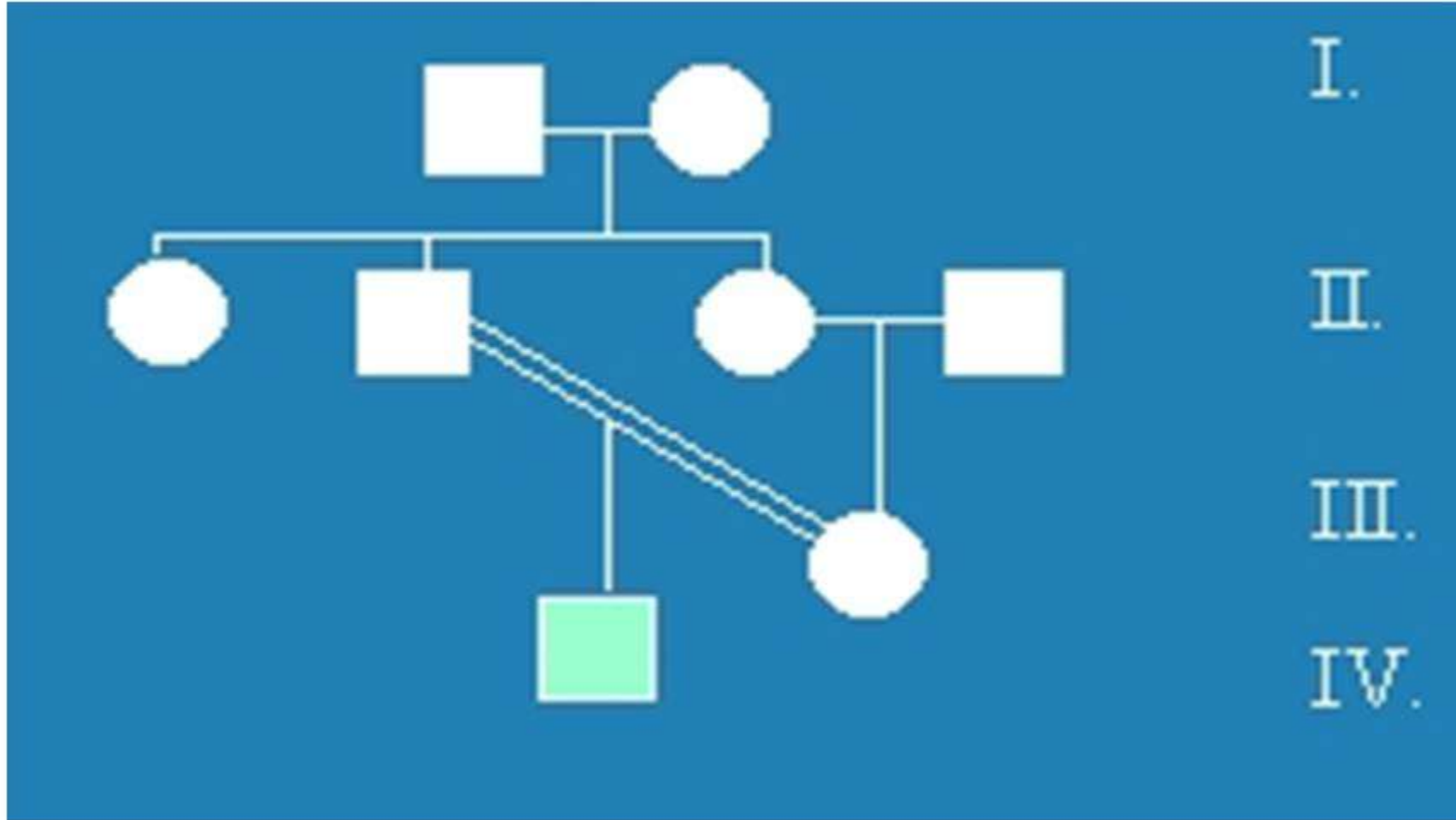
Mode of inheritance:

Autosomal dominant

bcz:

- ① Every generation is affected, so it is dominant
 - ② Male:Female is NOT 1:1 which might direct us toward "X-linked dominant" BUT it CANNOT be so bcz female #10 is unaffected while her father is affected.
 - ③ male #12 is affected while his mother is unaffected & his father is affected & this contradicts X-linked dominance pattern. (the son would have been unaffected if it were X-linked dominant disease)
- therefore it is autosomal dominant even though Male:Female is NOT 1:1 (Male:Female in autosomal diseases is typically 1:1 BUT not necessarily seen in all families)

What is the ^{most probable} mode of inheritance?



*note:

this is an unusual family but such scenarios can still happen this is called "incest" & in certain practices it can happen. it is typically discovered through genetic testing (طريقة جينية)

Mode of inheritance:

Autosomal recessive (most probably)

① it is **recessive** bcz the parents are unaffected **AND** there is consanguinity.

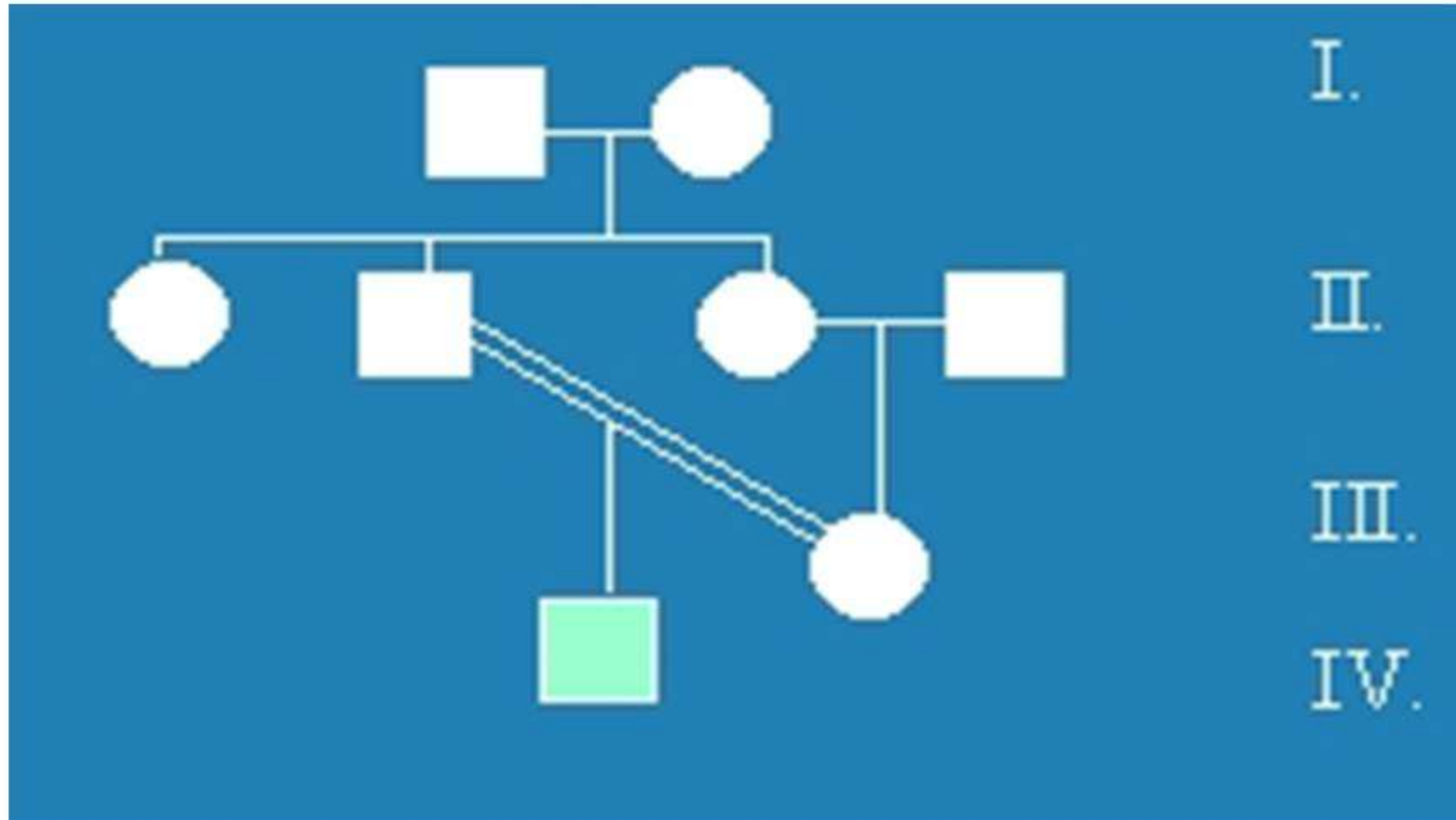
② it is **autosomal recessive** most probably why?

*note:

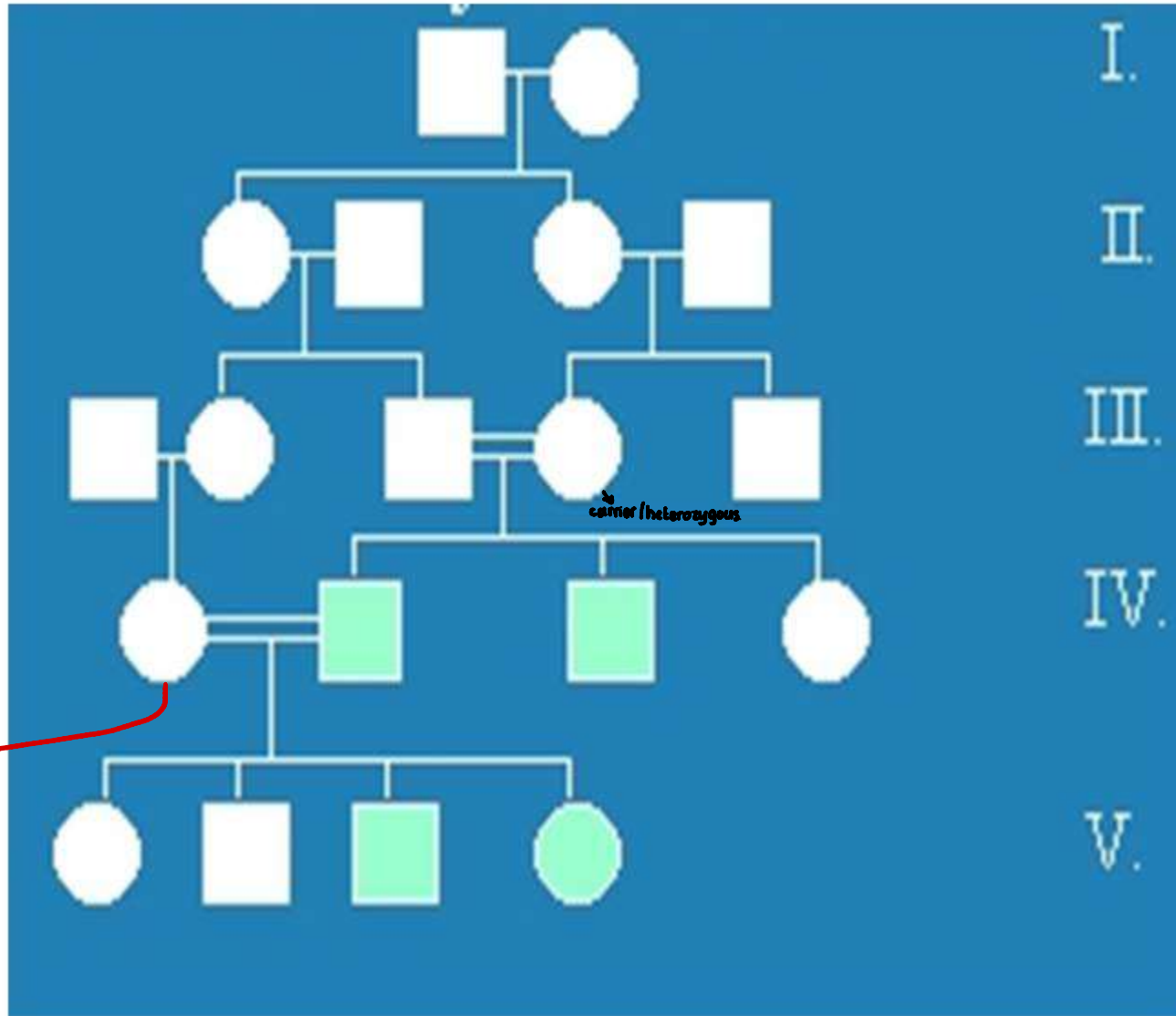
when we see a pedigree with a recessive mode of inheritance with nothing that contradicts it being autosomal (AND) nothing contradicts it being X-linked, there's a higher chance that it could be autosomal recessive due to the fact that there are thousands & thousands more genes located on autosomal chromosomes than there are on ch.X

What is the mode of inheritance?

Autosomal recessive



What is the mode of inheritance?



Mode of inheritance:
X-linked recessive

- ① it is recessive bcz not all generations have the disease.
- ② X-linked recessive bcz Male:Female is 3:1 (more affected males than females)

This female is heterozygous/carrier which is why some sons & daughters are affected while others aren't.

What is the mode of inheritance?

X-linked recessive; inbreeding shows apparent male to male transmission

