Name: Score:

15 Multiple choice questions

Term 1 of 15

What pattern of inheritance determines human ABO blood types?

- X-linked — A and B are linked to the X chromosome, O is autosomal recessive.
- Recessive — A and B are recessive, O is dominant.
- Dominance — A is dominant, B and O are recessive.
- Codominance — A and B alleles are codominant (both expressed when present together), and O is recessive.

Term 2 of 15

Which blood types can type O donate to?

- A, B, AB, and O (universal donor).
- Only AB.
- B and O.
- Only A and B.

Term 3 of 15

Write the genotype: Type AB.

- ($I^A I^B$).
- (i i).
- (I^A i) (must be heterozygous because O parent = (i)).
- : ($I^B I^B$).

Term 4 of 15

blood types can type AB receive from?

- Only O (universal donor).
- Only A and B.
- B and O.
- A, B, AB, and O (universal receiver).

Term 5 of 15

Parents: mother type A, baby type B. Which potential fathers from this list could NOT be the father? Mailman type O; Butcher type AB; Waiter type A; Cable guy type B.

- No — it's impossible for an (ii) mother to have AB child with any father. (State decision to remove baby could be based on that impossibility.)
- The Mailman (O) cannot be father (no B allele). The Waiter (A) cannot be father (no B allele). Butcher (AB) and Cable guy (B) could be fathers.
- If a parent with phenotype A or B produces an O child, that parent must be heterozygous (carrying (i)).
- No — baby genotype (I^B i) is possible from that cross (50% B). So not switched on blood-type evidence alone.

LIVEWORKSHEETS

Term 6 of 15

Genotypes that produce blood type A (phenotype A).

- (I^B I^B) or (I^B i).
- (I^A I^B).
- : (I^A I^A) or (I^A i).
- : (I^A i).

Term 7 of 15

Define codominance.

- Codominance — A and B alleles are codominant (both expressed when present together), and O is recessive.
- Codominance: both alleles are expressed equally in the heterozygote (e.g., blood type AB or black+white feathers = speckled/erminette pattern).
- B and O.
- Incomplete dominance: heterozygote phenotype is intermediate between the two homozygotes (e.g., red × white → pink).

Term 8 of 15

Genotype that produces blood type AB (phenotype AB).

- (I^A I^B).
- : (I^B I^B).
- (I^B I^B) or (I^B i).
- : (I^A i).

Term 9 of 15

Write the genotype: Heterozygous for the "A" allele.

- (I^A i) (must be heterozygous because O parent = (i)).
- (i i).
- : (I^A i).
- (I^A I^B).

Term 10 of 15

How to prove a parent is NOT heterozygous from a pedigree? (rule)

- Yes — (I^B i) is possible (50% B).
- A and O (i.e., (I^A I^A) / (I^A i) recipients can accept (I^A) and (i)).
- Codominance: both alleles are expressed equally in the heterozygote (e.g., blood type AB or black+white feathers = speckled/erminette pattern).
- You cannot be certain a parent is not heterozygous unless you know all children and their genotypes rule it out (absence of O children is not proof).

LIVEWORKSHEETS

Term 11 of 15

If two parents are (i i) (O) × (I^A I^B) (AB) could they have a B child?

- Yes — (I^B i) is possible (50% B).
- Yes — (I^A i) is possible (25% B).
- No — (I^B I^B) is not possible.
- No — (I^A I^A) is the only Possibility.

Term 12 of 15

Mother type O, baby type AB — is that possible?

- No — it's impossible for an (ii) mother to have AB child with any father. (State decision to remove baby could be based on that impossibility.)
- The Mailman (O) cannot be father (no B allele). The Waiter (A) cannot be father (no B allele). Butcher (AB) and Cable guy (B) could be fathers.
- No. A mother with genotype (ii) can only give an i allele and cannot contribute A or B; therefore a child AB (requires (I^A) and (I^B)) is impossible if mother is truly type O.
- If a parent with phenotype A or B produces an O child, that parent must be heterozygous (carrying (i)).

Term 13 of 15

Write the genotype: Can only get blood from a type O donor.

- Type O recipient, genotype (i i).
- Type B recipient, genotype (I^B I^B).
- Type AB recipient, genotype (I^A I^B).
- Type A recipient, genotype (I^A I^A).

Term 14 of 15

Amy (mother) type A; Linville (father) type B; baby is AB. Could they be the parents? (give parental genotypes that allow this)

- Codominance — A and B alleles are codominant (both expressed when present together), and O is recessive.
- Yes — (I^B i) is possible (50% B).
- Gametes: mother i,i; father (I^A, I^B). Cross → (I^A i), (I^B i) (two squares, both appear twice in 4-box format = 50/50).
- Yes — if mother = (I^A i) and father = (I^B i) (both heterozygous). Cross (I^A i) × (I^B i) can produce (I^A I^B) (AB).

Term 15 of 15

Punnett square: mother type O ((i i)), father AB ((I^A I^B)). What are the possible offspring blood types and percentages?

- No — baby genotype (I^B i) is possible from that cross (50% B). So not switched on blood-type evidence alone.
- No — it's impossible for an (ii) mother to have AB child with any father. (State decision to remove baby could be based on that impossibility.)
- Offspring genotypes: (I^A i) (50% → type A) and (I^B i) (50% → type B). So 50% A, 50% B.
- If a parent with phenotype A or B produces an O child, that parent must be heterozygous (carrying (i)).

LIVEWORKSHEETS