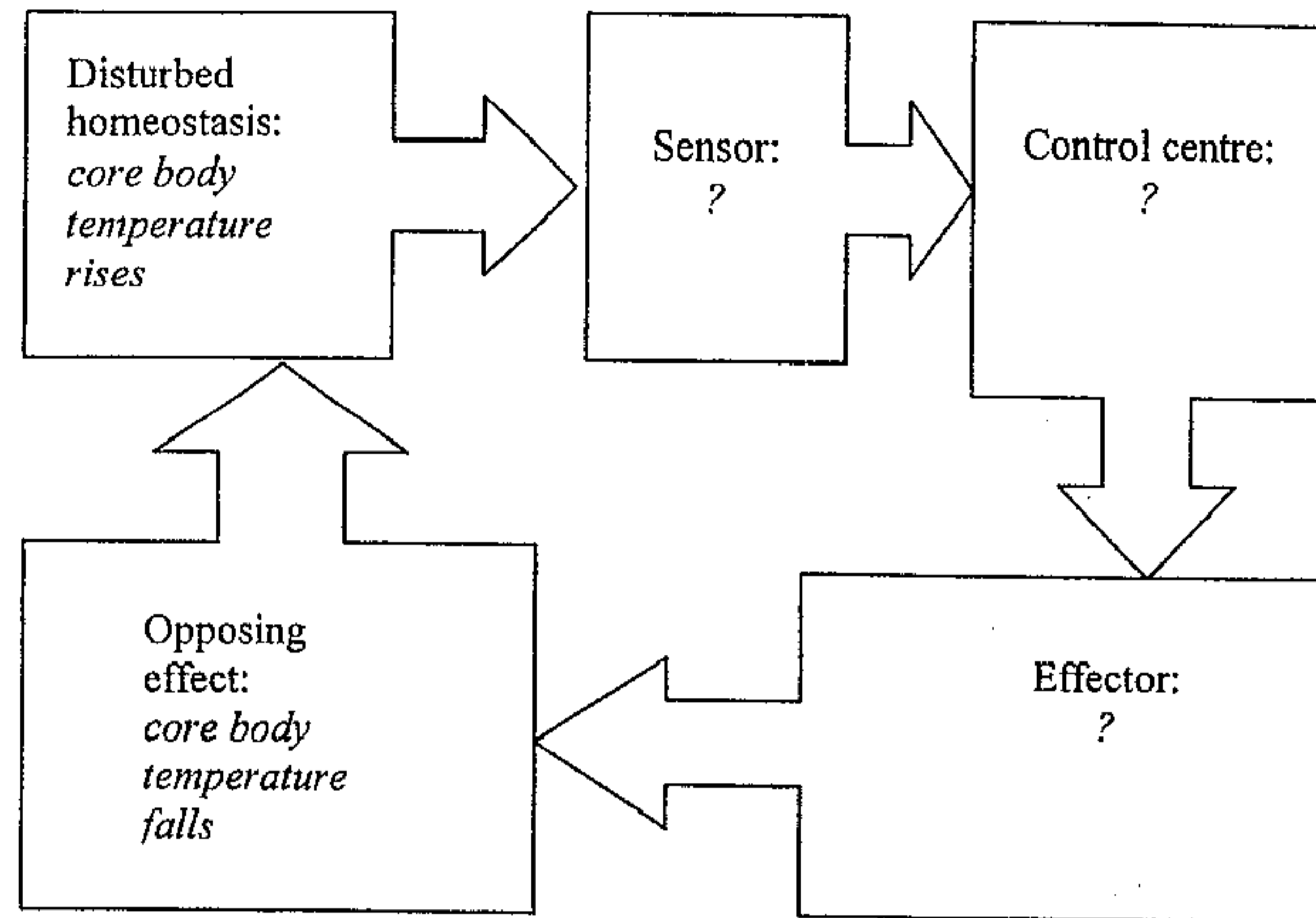


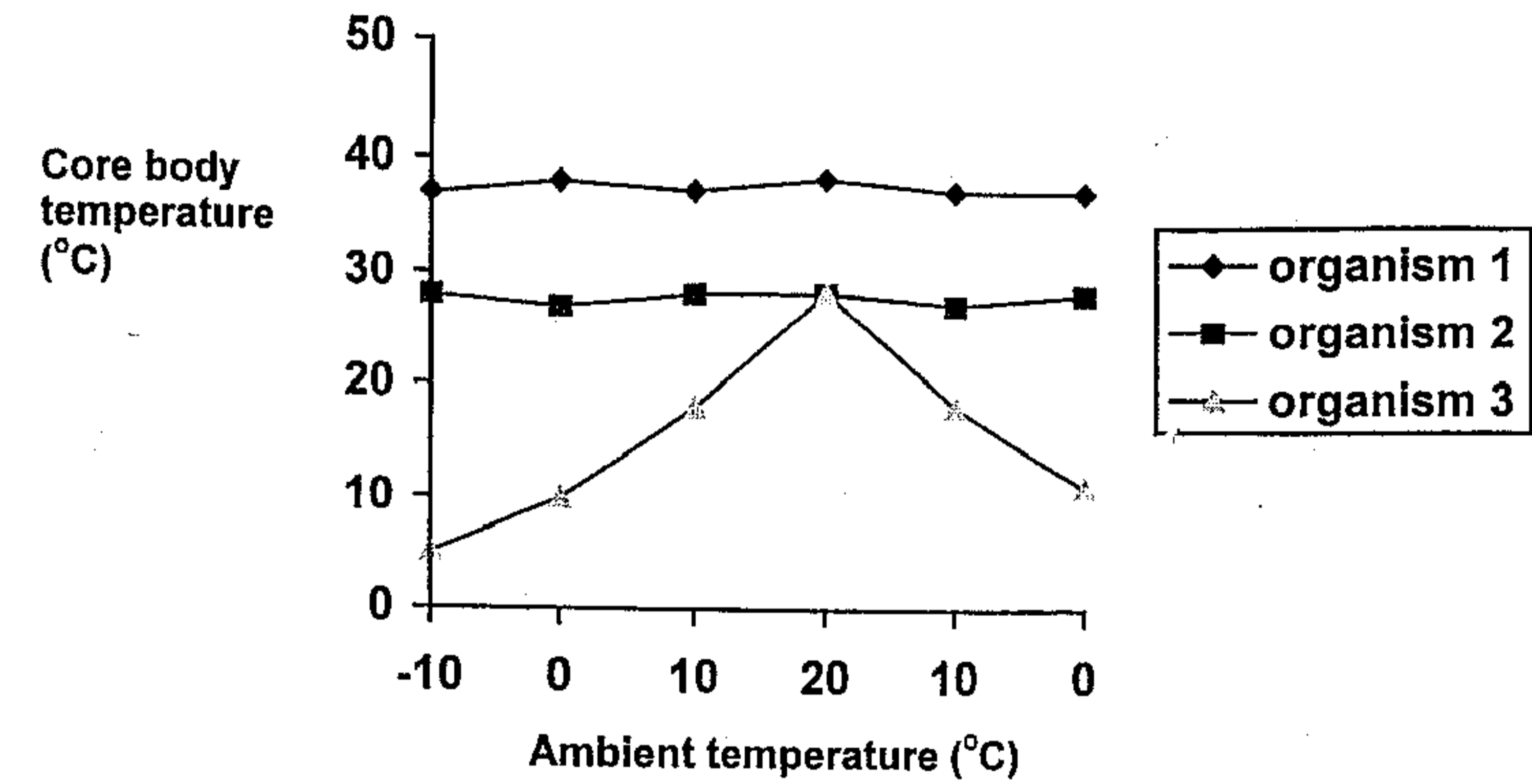
1. This question refers to the diagram, which is a simplified scheme of mammalian physiological responses to environmental temperature change.



Which option correctly represents the scheme?

	Sensor:	Control centre:	Effector:
(A)	pituitary gland	cerebrum of brain	thyroid gland
(B)	thermoreceptors in hypothalamus	hypothalamus	nerve cells of blood vessels
(C)	thermoreceptors in skin	hypothalamus	thermoreceptors in skin
(D)	nerve cells of blood vessels	cerebrum of brain	thermoreceptors in cerebrum of brain

2. The graph shows the relationship between the ambient temperature and the core body temperature for three different animals living in an Australian desert.



A student examines the graph and makes the following comments about the organisms:

		Temperature regulation classification	Response of animal to an ambient temperature of 0°C	Response of animal to an ambient temperature of 20°C
Comment 1	Organism 1:	ectotherm	shivering	basking in the sun
Comment 2	Organism 2:	endotherm	sheltering	moving
Comment 3	Organism 3:	ectotherm	shivering	basking in the sun

Which comment(s) are true?

- (A) Comment 1 only
- (B) Comment 2 only
- (C) Comment 3 only
- (D) Comments 2 and 3

3. Which statement correctly describes a healthy human's response to an increase in the concentration of carbon dioxide in the blood?

- (A) Breathing becomes deeper and slower.
- (B) There is an increase in the pH of the blood.
- (C) There is an increase the concentration of haemoglobin in the blood.
- (D) There is an increase the concentration of bicarbonate in the blood.

4. Which statement explains how urea in the blood moves into a nephron?

- (A) Blood stream pressure and osmosis across the membrane of the Bowman's capsule.
- (B) Blood stream pressure and tiny holes in the membranes of the Bowman's capsule and the glomerular capillaries.
- (C) Active transport across the membranes of the Bowman's capsule and the glomerular capillaries.
- (D) Gravity effects on the non-cellular components of blood in the Bowman's capsule.

5. Information about the presence or absence of a kidney, the nature of the nitrogenous waste and the type of urine produced for four different organisms is given in the table.

Organism	Contains a kidney?	Nitrogenous waste:	Urine water content relative to blood of organism:
1	no	uric acid	very low
2	yes	urea	medium to high
3	no	uric acid	very high
4	yes	ammonia	very high

Which organisms best represent an insect, a terrestrial mammal and a fish?

	insect	terrestrial mammal	fish
(A)	organism 1	organism 2	organism 4
(B)	organism 3	organism 1	organism 2
(C)	organism 1	organism 4	organism 2
(D)	organism 4	organism 3	organism 1

5. This picture of DNA was taken in 1958.



Who was the person who took this picture?

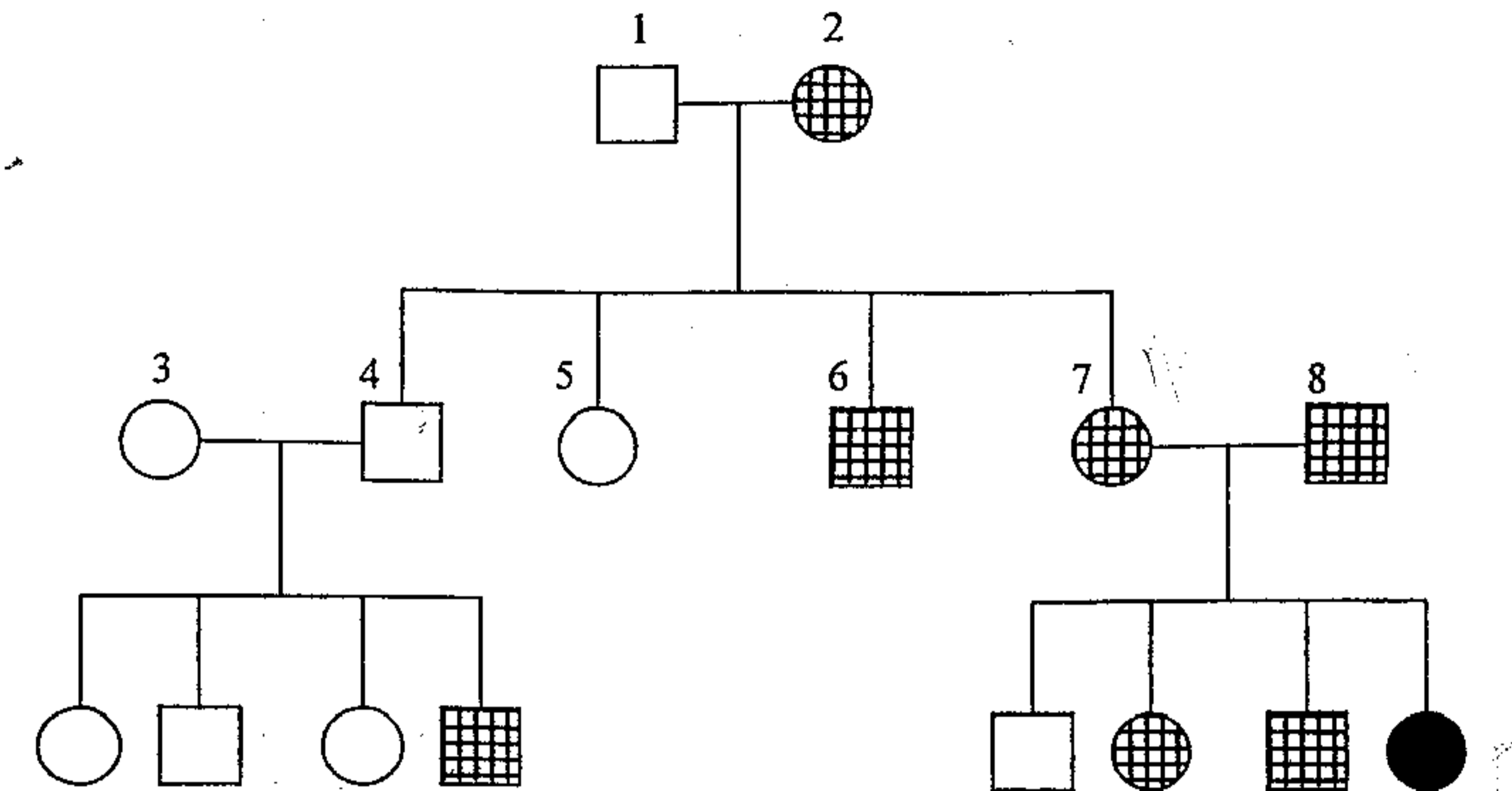
- (A) James D. Watson
- (B) Francis H. C. Crick
- (C) Rosalind Franklin
- (D) Maurice H. F. Wilkins

7. The first sex-linked trait discovered was white-eye colour in *Drosophila*; controlled by a recessive allele. This mutation suddenly appeared in pure breeding red-eyed *Drosophila* stock (the red eye allele being dominant).

What would be the phenotypic ratios if a heterozygous female fly for this trait were crossed with a red-eyed male fly?

	Females	Males
(A)	all white-eyed	50% white-eyed, 50% red-eyed
(B)	50% white-eyed, 50% red-eyed	all white-eyed
(C)	all red-eyed	25% white-eyed, 75% red-eyed
(D)	all red-eyed	50% white-eyed, 50% red-eyed

8. The pedigree for a particular condition in humans, involving the breaking down of an amino acid, is shown.



KEY

- male who can completely breakdown the amino acid in blood
- female who can completely breakdown the amino acid in blood
- male who breakdowns the amino acid at a reduced rate in the blood
- female who breakdowns the amino acid at a reduced rate in the blood
- male who cannot breakdown the amino acid at all
- female who cannot breakdown the amino acid at all

The observations made by four students about the pedigree are given in the table.

Which observer is correct?

		Genotype of Individual '7'	Type of inheritance
(A)	Observer 1:	pp	recessive
(B)	Observer 2:	PP	incomplete dominance
(C)	Observer 3:	Pp	incomplete dominance
(D)	Observer 4:	X ^P X ^P	incomplete dominance

9. Scientist 'X' studied sea urchins and found that chromosomes are needed for sea urchin cells to develop. Scientist 'Y' studied male grasshoppers and suggested that genes are 'particles' located in chromosomes.

Who were scientists 'X' and 'Y'?

	Scientist 'X'	Scientist 'Y'
(A)	T. Boveri	W. S. Sutton
(B)	T. H. Morgan	G. Mendel
(C)	W.S. Sutton	G. Mendel
(D)	G. Mendel	T. Boveri

10. What is an advantage and a disadvantage of forming hybrids of corn or wheat?

	Advantage	Disadvantage
(A)	increased yield of crop	increased genetic variability
(B)	increased disease resistance	decreased genetic variability
(C)	decreased genetic variability	harder to harvest
(D)	increased genetic variability	a uniform crop

11. Which is the correct sequence of water purifying methods?

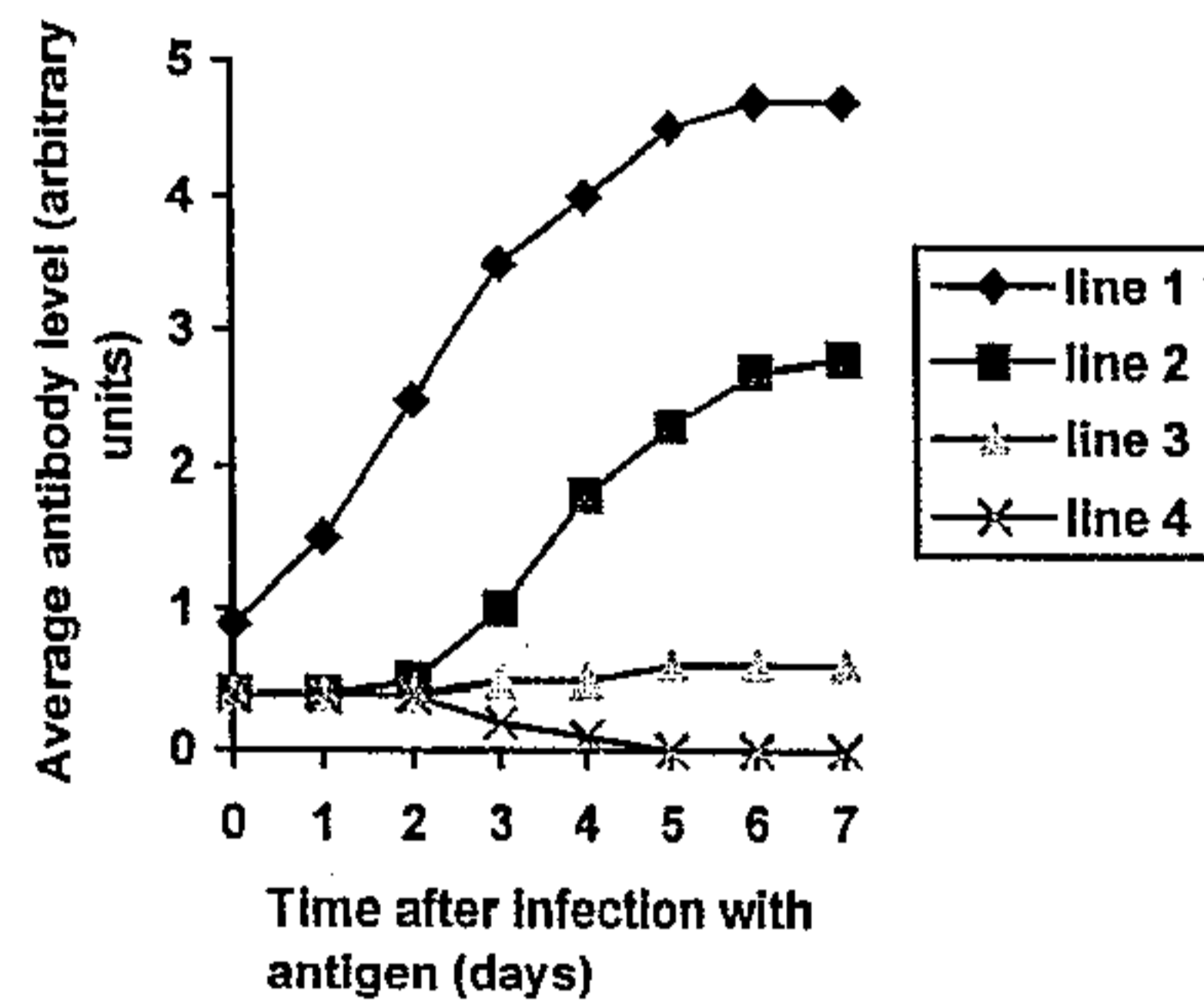
	least effective method → most effective method			
(A)	gravel/sand filtering	chlorine gas spray to water droplets	boiling for 3 minutes	membrane (0.2 μm pores) filtering
(B)	membrane (0.2 μm pores) filtering	boiling for 3 minutes	chlorine gas spray to water droplets	gravel/sand filtering
(C)	boiling for 3 minutes	chlorine gas spray to water droplets	gravel/sand filtering	membrane (0.2 μm pores) filtering
(D)	chlorine gas spray to water droplets	boiling for 3 minutes	membrane (0.2 μm pores) filtering	gravel/sand filtering

12. Which option is the best explanation for the occurrence of candidiasis?

	Factor which leads to the formation of the disease	Explanation for the disease	Effect on microflora
(A)	use of antibiotics	decrease in the amount of naturally occurring microbes in the mouth and respiratory tract	increase in the number of <i>Candida albicans</i>
(B)	use of antibiotics	increase in the amount of naturally occurring microbes in the gastrointestinal tract	increase in the number of <i>Candida albicans</i>
(C)	immune suppression	increase in the amount of naturally occurring microbes in the mouth and respiratory tract	decrease in the number of <i>Candida albicans</i>
(D)	immune suppression	formation of new microbes in the mouth and respiratory tract	increase in the number of <i>Candida albicans</i>

13. Which process occurs as a result of the inflammation response when a person accidentally gets cut?
- (A) Blood moves quicker through the injured area.
 (B) Blood moves slower through the injured area.
 (C) The amount of fluid in the injured area decreases.
 (D) Blood clotting does not occur in the injured area.
14. A vaccinated person for a particular antigen and a person who has not been vaccinated for the same antigen are both infected with the antigen at the same time.

Which lines of the graph show the responses of the vaccinated person and the person who has not been vaccinated for the particular antigen?



	Vaccinated person's response is represented by	Non-vaccinated person's response is represented by
(A)	line 2	line 4
(B)	line 2	line 1
(C)	line 1	line 3
(D)	line 1	line 2

15. Black spot is a fungus that manifests itself as black spots on rose leaves causing the leaves to yellow and fall prematurely. A nursery owner decides to grow some roses during summer time, when the average temperature of the garden is 25°C.

Which option contains conditions that are the most likely to result in Black spot on the roses?

	Spacing of rose plants	Amount of sunlight exposure	Watering time
(A)	10m	high	middle of the day
(B)	5m	moderate	mid-afternoon
(C)	3m	low	early morning
(D)	0.3m	very low	just before darkness