

### 1. Hormone

- (A) chemical substance produced by a (endocrine) gland
- (They are) carried/transported by the blood
- (A hormone) alters/changes/affects the activity of specific target organs

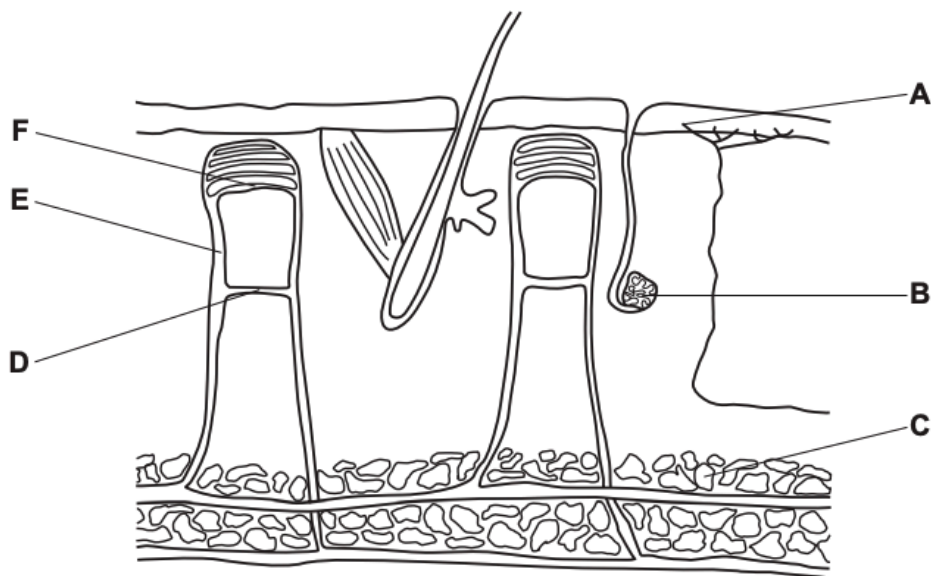
### 2. How liver responds to increase in insulin concentration

- (Insulin) stimulates (the production of) enzymes
- (Responsible for the) conversion of glucose to glycogen
- Glycogen is stored / insoluble
- (It stimulates the) increased uptake / absorption / respiration of glucose by liver (cells)

### 3. Organ that coordinates the control of body temperature: brain

4.

Fig. 1.1 shows a diagram of a section through human skin.



A = thermoreceptor

B = sweat gland

C = fat cells

D = shunt vessel

E = arteriole

### 5. How arteriole & shunt vessel are involved in maintaining a constant internal body temperature in a cold environment

- vasoconstriction (of arterioles / E) ;
- shunt vessels / D, dilate / widen ;
- less blood flow to skin (capillaries) / F ;

- reduces heat loss from blood ;

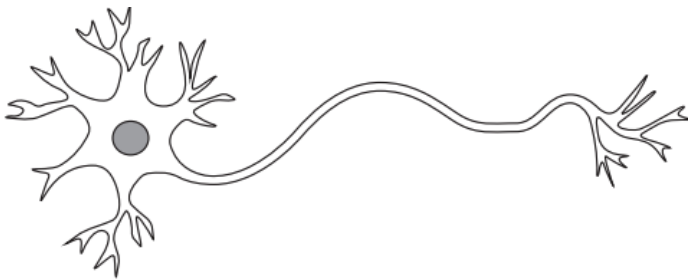
### 6. How auxin causes gravitropism response in shoots

- (auxin/ hormone produced in the tip)
- moves / diffuses, away from tip / down the, stem or shoot or plant ;
- moves to / collects on, one / lower side (of stem / plant) ;
- stimulates cell elongation ;
- stem / plant, bends / grows / turns, upwards ;

### 7. Benefits of gravitropism for shoots

- reach light for photosynthesis ;
- (reach air for) carbon dioxide for photosynthesis ;
- (reach air for) oxygen for respiration ;
- idea that they grow tall so that flowers are exposed for, (wind / insect) pollination

### 8. Relay neurone: connects neurons / transmits impulses within the CNS



NOTE: Receptor molecule for neurotransmitter will be found on the LHS

### 9. How neurones are adapted for transmitting impulses

- Long axons to transmit impulses over long distance / fast / direct connection
- Many branches to connect to other / relay neurones / cells / effector / muscle
- Mitochondria to release energy for transmission of impulse / protein synthesis / active transport / making or releasing neurotransmitters
- Vesicles to, carry / hold / release, chemicals / neurotransmitters into synapse
- Receptor molecules to ensure unidirectional transmission / to allow signal to be received by next neuron

### 10. How nervous communication differs from hormonal communication

- faster
- shorter-lasting
- electrical (and chemical) ; uses impulses
- conducted through cells / uses neurones / uses nerves / uses CNS
- specific / one target / location

## **NOTE**

- Changing shape of lens so eye can focus on near and distant objects: **accommodation**
- Radial & circular muscles in iris: pair of **antagonistic muscles**
- The peripheral nervous system consists of only sensory and motor neurons

### **11. Optic nerve:**

in the eye; contains sensory neurons that conduct impulses to the brain.

### **12. Outline the pathway in a reflex arc in response to shining a bright light into the eye.**

- stimulus / light (detected by) retina / rod / cone / receptor
- reference to electrical impulse / electrical signal
- sensory neurone → relay / connector neurone → motor neurone
- synapses between neurons
- effector / circular muscles in iris, contract / respond

### **13. Suggest why reflexes occur in people who are unconscious.**

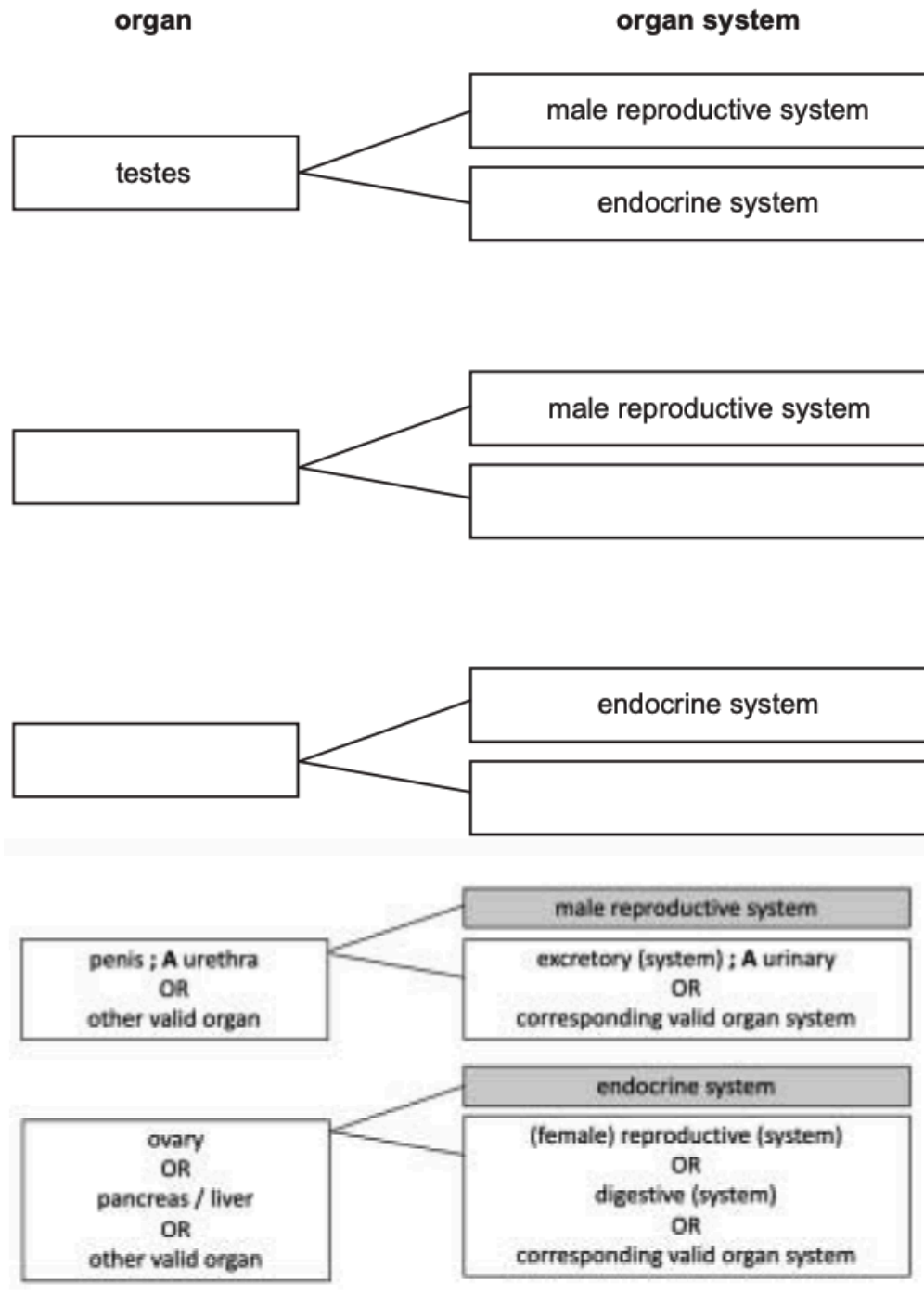
- automatic / involuntary
- receptors / neurones / nerve, still function

14.

The testes are also part of the reproductive system. This means that the testes are part of two organ systems.

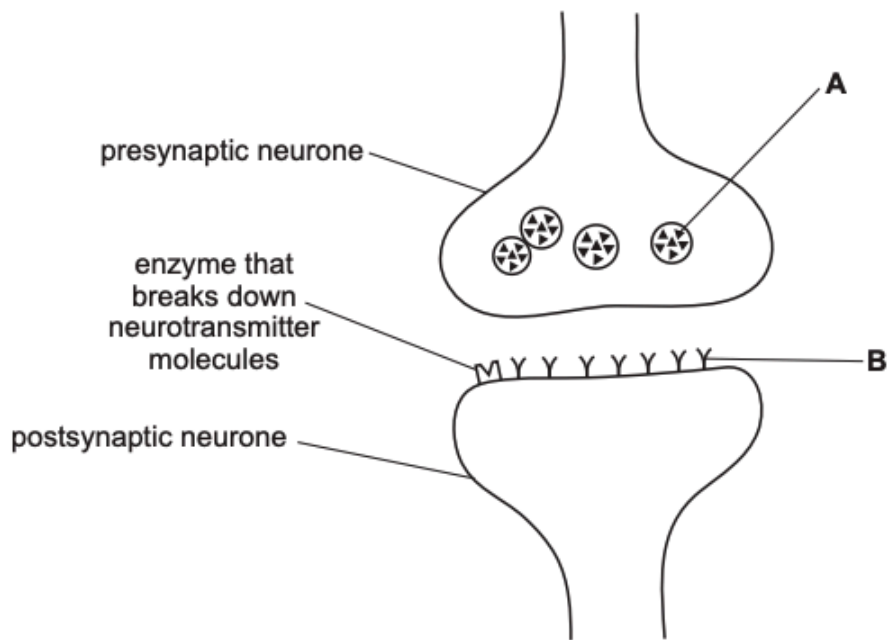
Complete Fig. 5.1 by stating **two** other organs that also belong to **two** organ systems.

One has been completed for you.



15.

Fig. 3.1 shows the junction between two neurones.



**Fig. 3.1**

Many drugs interfere with the action of neurotransmitters at the junctions between neurones.

Two drugs that influence the transmission of impulses between neurones are atropine and eserine. The actions of these drugs are shown in Table 3.1.

**Table 3.1**

drug	action at junctions between neurones
atropine	blocks receptor molecules for neurotransmitters
eserine	blocks the enzyme that breaks down neurotransmitters

**Explain the effects of these two drugs on the nervous system**

- neurotransmitters move across, synapse / gap / junction

Atropine

- neurotransmitter cannot bind to / enter / reach receptors
- therefore no impulses along next / postsynaptic neurone / no impulses reach CNS
- no sensitivity to stimuli / feels no pain; painkiller
- no contraction of muscle / response; depressant

Eserine

- neurotransmitter stays in synapse / synaptic gap
- continuously stimulates the next / postsynaptic neurone
- more impulses are sent to next / postsynaptic neurone
- repeated contraction of muscle / response
- May be used as a stimulant

**16. Explain how the response of stems to gravity is controlled.**

- auxin is made in the shoot / stem tip
- moves away from the tip
- moves to / collects on lower side of stem
- stimulates cell elongation
- stem bends / grows upwards

**17. Describe and explain the changes that occur in the eye when adjusting focus from a distant object to a near object**

- ciliary muscles contract
- tension in suspensory ligaments decreases
- lens becomes more convex
- causing more refraction

**18. Describe the function of rods and cones in the eye**

rods / cones, are light receptors OR detect / respond / sensitive, to light ;

rods:

- sensitive to / function in light of low intensity OR used for night vision
- provide black and white vision

cones:

- sensitive to light of high intensity
- ref. to three different types of cone
- provide colour vision

receptor	distribution across the retina		
	peripheral retina	blind spot	fovea
rods	many	none	none / few
cones	few	none	many

**19. Explain why the eye can be described as a sense organ**

- contains (a group of) receptor cells ;
- that, detect / respond, to, light / (specific) stimuli ;

retina	<b>H</b>	contains, receptor (cells) / rods <b>and</b> cones
optic nerve	<b>G</b>	transmits impulses to the central nervous system
cornea	<b>D</b>	refracts light / allows light to <del>enter</del> the eye

**20. Explain why a person is unable to focus on distant objects if the suspensory ligaments become permanently overstretched.**

- ciliary muscles relax
- suspensory ligaments can no longer become taut
- lens, is not stretched / remains wide
- angle of refraction remains unchanged / AW

21.

(a) A student investigated plant growth responses in roots and shoots. They used this method:

- Damp cotton wool was placed in two Petri dishes.
- Three bean seedlings were attached to the cotton wool in each Petri dish.
- Each seedling was orientated so that the roots pointed in a different direction in each Petri dish.
- Petri dish 1 was kept on its side in a fixed position.
- Petri dish 2 was kept on its side and rotated constantly.
- Both Petri dishes were kept in the dark.
- Both Petri dishes were kept in these conditions for two days.
- After two days the seedlings were observed.

Fig. 6.1 is a diagram of the apparatus.

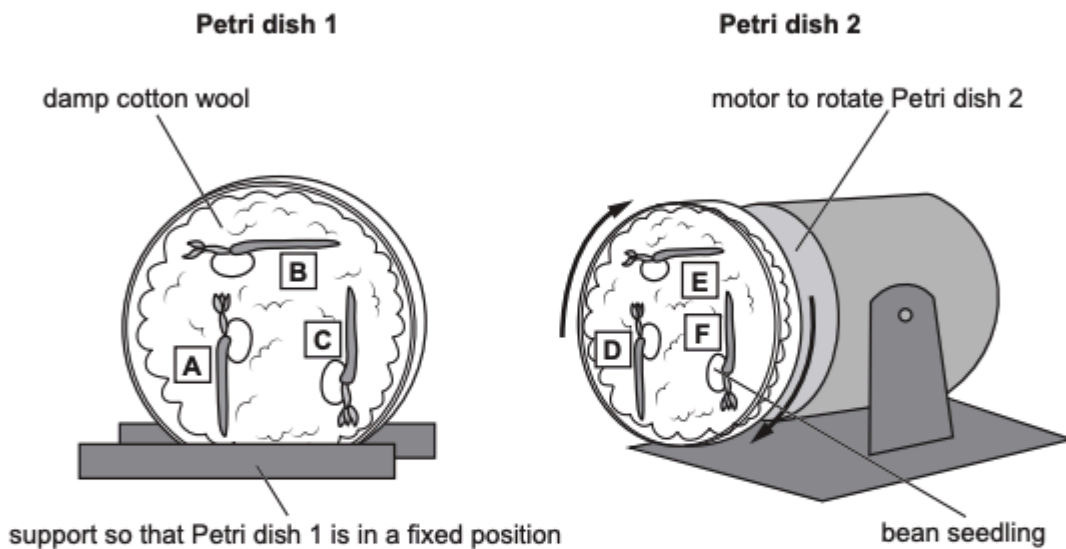


Fig. 6.1

Fig. 6.2 shows the seedlings after two days.

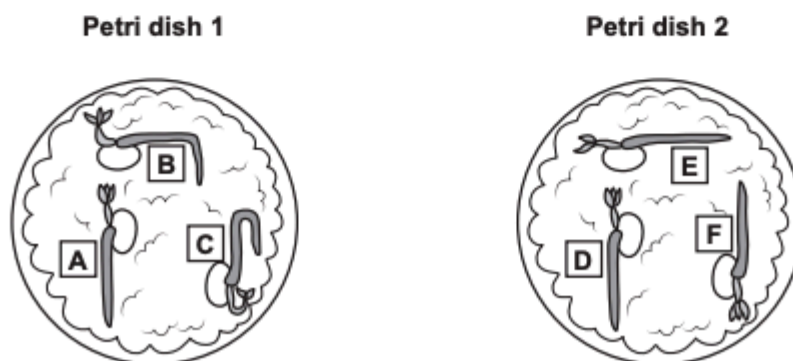


Fig. 6.2

Explain how auxin causes the difference in the pattern of growth shown by the shoots of seedlings B and E

- (auxin) made in / released from, (shoot) tip ;
- (auxin) moves by diffusion ;



- (auxin) stimulates cell elongation ;

In B / Petri dish 1:

- (auxin) has a higher concentration of auxin on the lower surface (of the shoot) ; ora
- (auxin stimulates cell) elongation more on lower side of the shoot ; ora
- shoot grows away from the pull of gravity / AW ;

In E / Petri dish 2:

- (auxin is) equally distributed (in the shoot) ;
- (auxin stimulates cell) elongation equally on, both / all, sides of the shoot ;
- (shoots grow neither up or down / shoot grows straight) because the effect of gravity is, constantly changing / countered by rotating (the Petri dish)

**22. Explain how negative feedback controls the blood glucose concentration of a person who has not eaten for a day.**

- (blood) glucose concentration is low / decreases
- (causing) glucagon secretion / production
- glucagon released from / produced in pancreas
- (glucagon stimulates) breakdown of glycogen / release of glucose (into the blood)
- from liver / muscle
- (blood) glucose concentration goes (back) up / returns to normal/ stays within limits

NOTE: light is refracted as it passes from the air into the cornea.