

Core 1

(a) State the term which is used to describe the maintenance of a constant internal environment in the human body.

.....[1]

(b) Describe how each of the following processes helps to maintain the temperature of the body:

(i) sweating;

.....
.....
.....[2]

(ii) vasodilation.

.....
.....
.....
.....[3]

[Total : 6]

Core 2

Fig. 1 shows the urinary system and its blood supply.

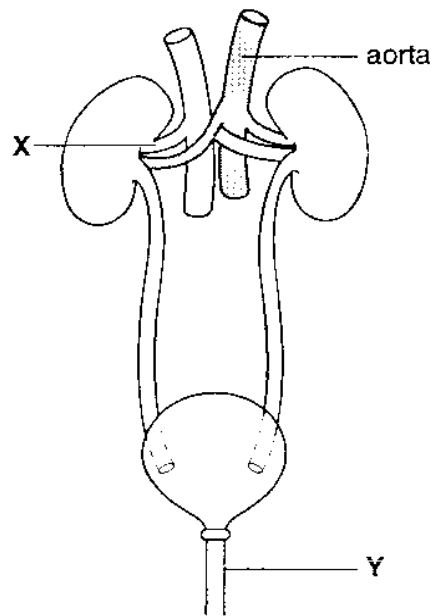


Fig. 1

(a) (i) Identify the structures labelled **X** and **Y** on Fig. 1.

X

Y [2]

(ii) A function of the kidney is to remove urea from the blood. State **one** other function of the kidney.

.....[1]

(b) The liver forms urea by breaking down excess amino acids. Name **two** other substances which are broken down by the liver.

1.

2. [2]

(c) The liver and kidneys are organs which help to maintain a constant internal environment.

Which term describes this process?

..... [1]

[Total:6]

Core 3

(a) A student reaching for a book on a bookshelf pricks his finger on the sharp point of a nail. He pulls his hand away very quickly.

(i) State the type of response which has occurred.

.....[1]

(ii) What is the effector in this response?

.....
[1]

(iii) Name the type of nerve cell which links the central nervous system to the effector.

.....[1]

(b) Fig. 2 shows part of the leg of a crab.

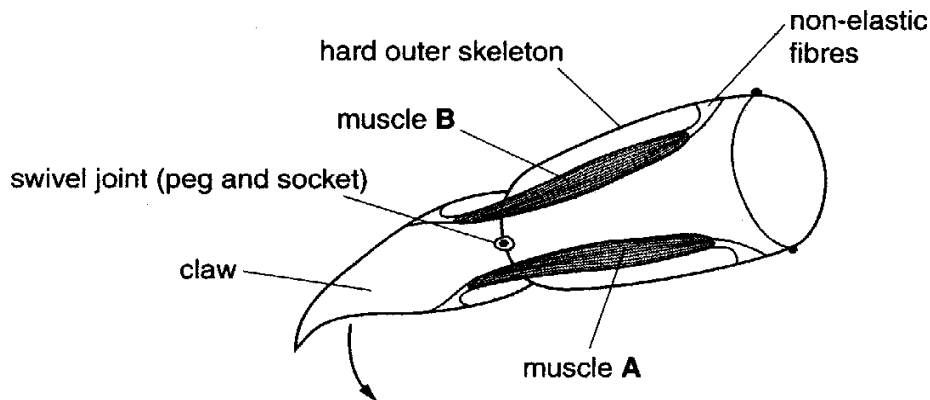


Fig. 2

(i) State what happens to muscles, A and B, in order for the claw to move in the direction of the arrow.

Muscle A

Muscle B[1]

(ii) Why do muscles in the leg occur in pairs?

.....
[1]

(iii) Suggest why the fibres which join the muscle to the skeleton are non-elastic.

.....
[1]

[Total : 6]

Alternative to practical 1

Fig. 3 shows a rotating clinostat with five seedlings attached.

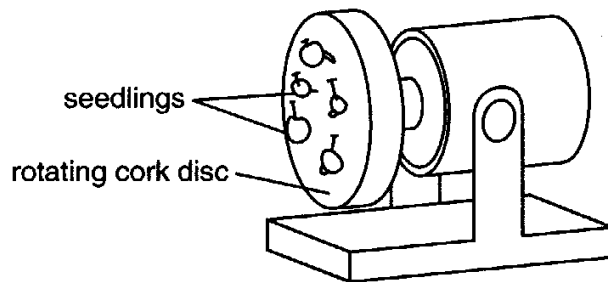
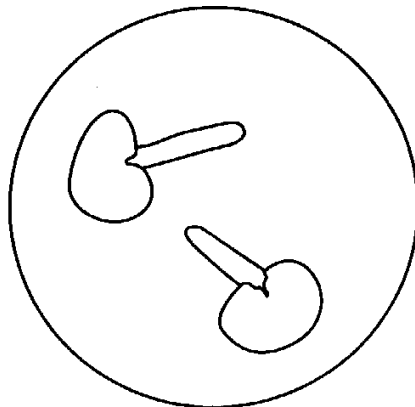


Fig. 3

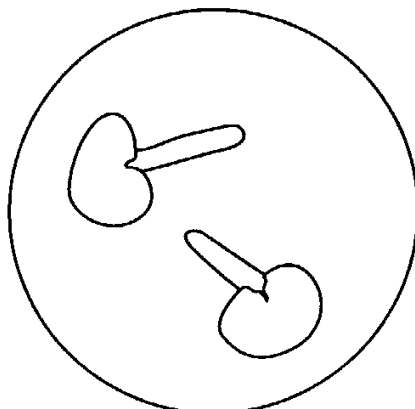
The cork disc is rotated slowly so that all sides of the seedlings are equally exposed to the stimulus of gravity.

- (a) (i) On the diagram below, show the appearance of the seedlings after being attached to the rotating clinostat for two days. No labels are required.



[1]

- (ii) On the diagram below, show the appearance of the seedlings after two days if the clinostat had **not** been rotating.



[2]

Alternative to practical 1

(iii) Explain the new appearance of the seedlings in **(a) (ii)** after two days.

.....
.....
.....
.....[2]

(b) (i) What condition must be provided to ensure continued growth of the seedlings over the two day period?

.....
.....[1]

(ii) How could this be achieved?

.....
.....[1]

(c) Describe how you would ensure that **only** the response to gravity is being investigated.

.....
.....[1]

[Total : 8]

Extension 1

- (a) (i) Define the term *reflex action*. [3]
(ii) Describe the pupil reflex and explain its advantages. [5]
- (b) Distinguish between rods and cones in terms of function and distribution. [4]
- (c) Suggest how damage to **three named** parts of the eye could result in impaired vision or blindness. [3]

[Total:15]

Extension 2

- (a) (i) Define the term *reflex action*. [3]
(ii) Describe the pupil reflex and explain its advantages. [5]
- (b) Distinguish between rods and cones in terms of function and distribution. [4]
- (c) Suggest how damage to **three named** parts of the eye could result in impaired vision or blindness. [3]

[Total:15]

Core 1

a homeostasis

b(i) evaporation of sweat / water
removes heat from the body / cools the body / reference to latent heat of
vaporisation

(ii) arterioles in skin relax
increased blood flow through surface capillaries
more heat loss from body by convection / radiation

Core 2

a(i) X – renal vein

Y – urethra

(ii) remove water / salts (from blood) or
osmoregulation or
control of water / salt content (of the blood)

b any two from these

alcohol
drugs / named drug
haemoglobin
hormones / named hormone
toxins

c homeostasis

Core 3

- a(i) reflex response / action / involuntary / automatic
- (ii) arm muscles / named arm muscle / muscle (unqualified)
- (iii) motor (neurone)
- b(i) **A** – contracts **B** – relaxes **reject** – expands / stretches
- (ii) to pull leg / part of leg in opposite / different directions
- (iii) to pass / transmit all of muscle pull to skeleton / not to lose some pull in stretching the fibres

Alternative to Practical 1

- a(i) diagram shows all seedlings with longer straight roots
- (ii) diagram shows all seedlings with curved roots towards source of gravity
correct extended growth region
- (iii) root tip / root / radicle responds towards gravity / grows downwards / shows geotropism
reject points downwards / bends (or alternative wording)

correct reference to role of auxins

- b(i) any one from
water / moisture
air / oxygen
correct temperature / heat / warmth
reject carbon dioxide, light, minerals

- (ii) must link to b(i)

water / moisture

protective covering / glass / plastic box / keep seedlings moist / prevent seedlings drying out / adds water daily / supply water / soaked cotton wool

warmth

heat from lamp / in temperature box / facing the sun / out of air conditioned area / warm room

air / oxygen

ventilation / fan / breathing

- c keep apparatus in the dark / uniform continuous light / red light / in light from all directions / keep moist to avoid hydrotropism

Extension 1

- a(i) automatic response
to a stimulus
and one from
reference to very fast
reference to innate / not learned
- (ii) any six points from these
light shines on (or alternative wording) retina
electrical impulse generated (or alternative wording)
passed to brain via motor neurones
to iris
circular muscles contract **reject** references to ciliary muscles
to make pupils smaller
protects rods and cones / retina from damage
reflex is very fast / does not require thought / does not require decision
- b any four from
cones detect colour
reference to three types of cones / detect red, green, blue
cones needed for fine detail
rods cannot detect colour / only produce image in black and white
rods distributed all over retina
cones concentrated in fovea / yellow spot
cones only stimulated by bright light / rods sensitive to dim light
- c any three from these
rods / cones / retina / damaged by bright light so not receptive
lens cloudy or damaged so light cannot pass through
cornea cloudy or damaged so light cannot pass through
eyeball deformed / retina detached so cannot focus
optic nerve damaged so no impulses transmitted (or alternative wording)

Extension 2

a any four points from these

excretion

removal from the body of waste products of metabolism
reference to substances which are poisonous / in excess / surplus to requirements

egestion

removal of faeces from the body
reference to via anus

b drawing marks

includes aorta, renal artery, kidney, ureter, bladder and urethra
drawing clear and parts correctly labelled

explanation

reference to blood from aorta to renal artery
blood enters kidney
water filtered out
reference to formation of urine
urine passes down ureter
reference to storage in bladder
reference to sphincter muscle and role
urine passes through urethra

c any four from

reference to deamination / breakdown of proteins or amino acids
reference to formation of urea
reference to breakdown of hormones / named hormones
reference to breakdown of alcohol
reference to breakdown of nicotine / other named drugs