(a)		te the term which is used to describe the maintenance of a constant internal ironment in the human body.
		[1]
(b)	Des bod	cribe how each of the following processes helps to maintain the temperature of the y:
	(i)	sweating;
		[2]
	(ii)	vasodilation.
		[3]
		[Total : 61

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

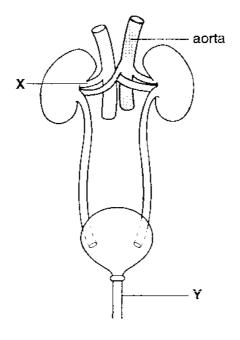


Fig. 1

(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]

(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.

1	(ii)	What is the	ne effector in	this response?

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

 ***************************************
 [1]

- (iii) Name the type of nerve cell which links the central nervous system to the effector.
- (b) Fig. 2 shows part of the leg of a crab.

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

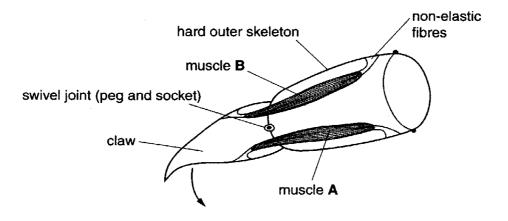


Fig. 2

(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]

.....[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.

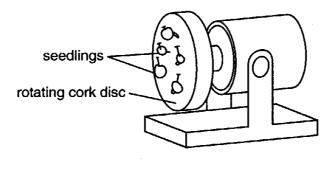
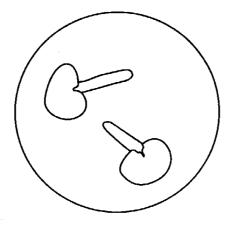


Fig. 3

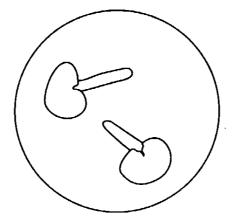
The cork disc is rotated slowly so that all sides of the seedlings are equally exposed to the stimulus of gravity.

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

[Total: 8]

# **Extension 1**

(a)	(i)	Define the term reflex action.	[3]
	(ii)	Describe the pupil reflex and explain its advantages.	[5]
(b)	Dis	tinguish between rods and cones in terms of function and distribution.	[4]
(c)	-	ggest how damage to <b>three named</b> parts of the eye could result in impaired dness.	vision or [3]
			[Total:15]
Ex	tens	sion 2	
(a)	(i)	Define the term reflex action.	[3]
	(ii)	Describe the pupil reflex and explain its advantages.	[5]
(b)	Dis	tinguish between rods and cones in terms of function and distribution.	[4]
(c)	-	ggest how damage to <b>three named</b> parts of the eye could result in impaired dness.	vision or [3]
			[Total:15]

- 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

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

- 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

#### <u>warmth</u>

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