

5: Coordination, response & homeostasis – Topic questions**Paper 3**

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
3	2016	June	31
8	2016	March	32
8	2016	November	31

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

3 Fig. 3.1 shows a section through the skin.

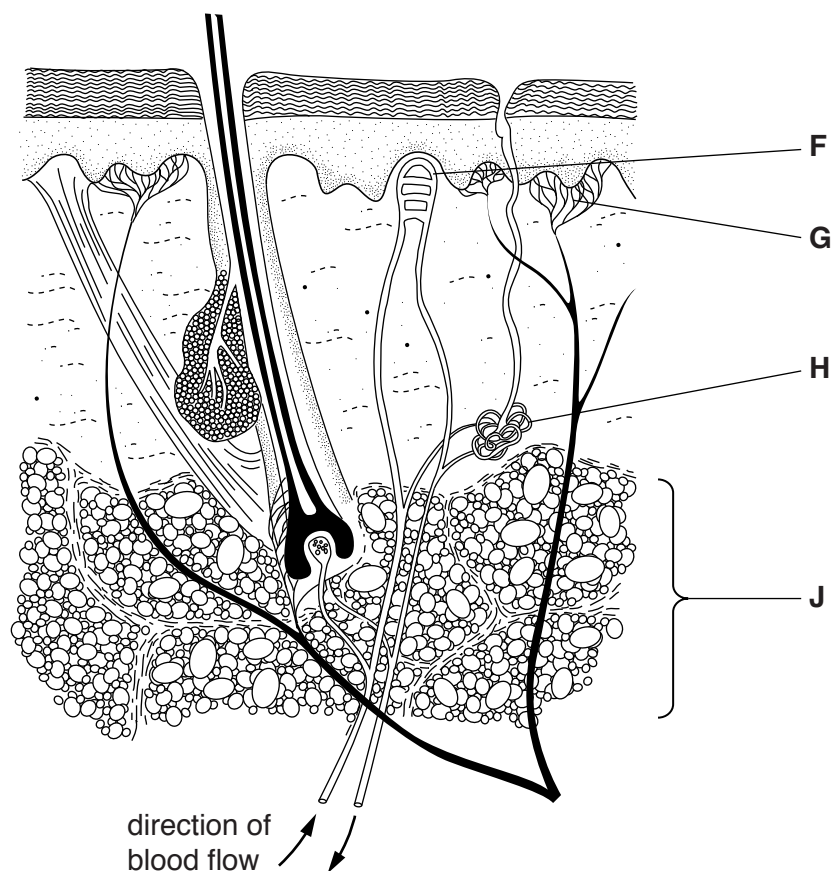


Fig. 3.1

(a) Name the structures labelled in Fig. 3.1 and outline a function in the skin for each one.

Write your answers in Table 3.1.

An example has been done for you.

Table 3.1

structure	name of structure	function in the skin
F		
G		
H	sweat gland	produces sweat for cooling the body
J		

- (b) In an investigation the volume of sweat produced by a student was measured when running while carrying different masses in a back-pack.



The results are shown in Fig. 3.2.

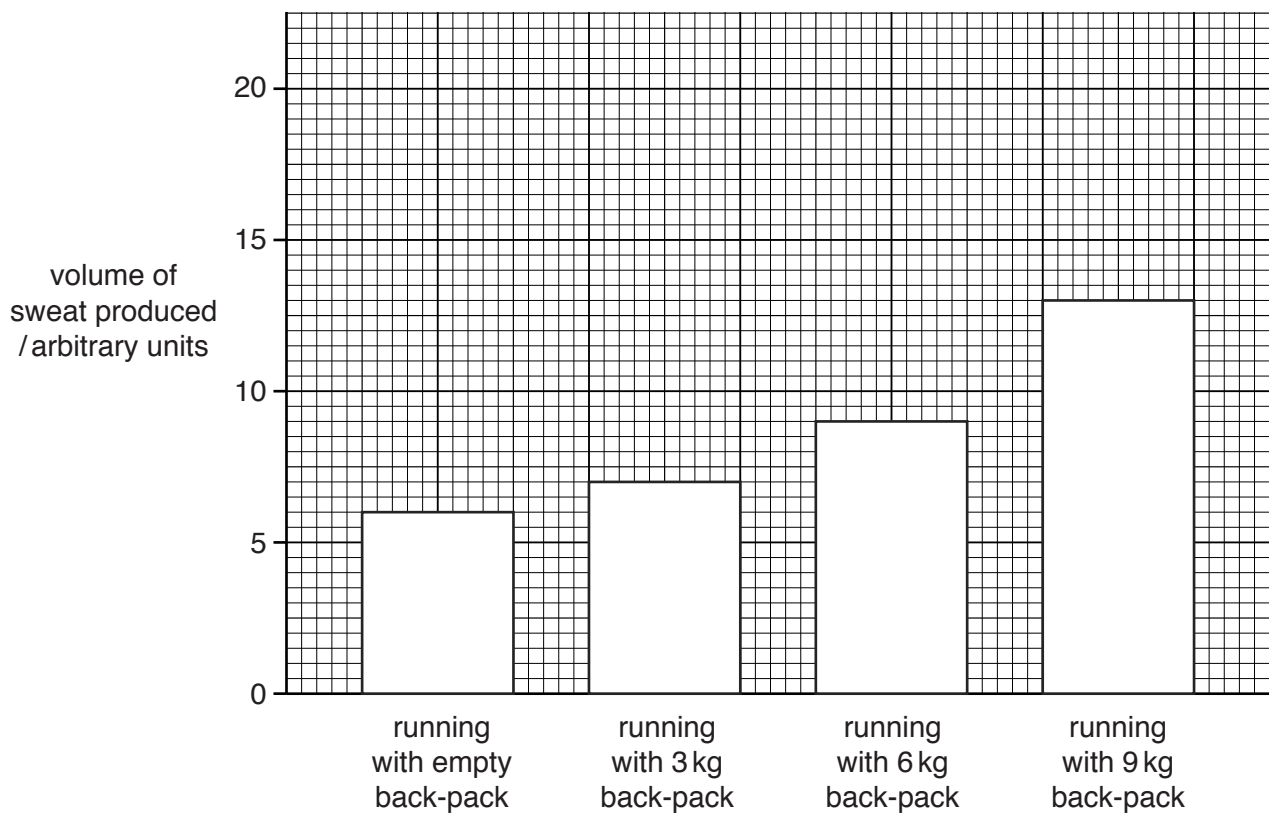


Fig. 3.2

(i) Use Fig. 3.2 to state:

the volume of sweat produced when running with an empty back-pack

..... arbitrary units

the volume of sweat produced when running with a 9 kg back-pack

..... arbitrary units

Use these two volumes to calculate the percentage increase in sweat production when running with a 9 kg back-pack.

Give your answer to the nearest whole number.

Show your working.

..... %
[3]

(ii) This investigation was carried out when the air temperature was 10 °C.

Predict the effect of carrying out the same investigation if the air temperature was 15 °C.

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

(c) When the student was at rest the volume of sweat produced was 2 arbitrary units.

The volume increases during exercise as the body needs to keep cool.

Explain how this cooling takes place.

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

[Total: 13]

8 (a) Name the **two** components that form the central nervous system (CNS).

1

2 [2]

(b) Sense organs respond to specific stimuli.

Name **three** different stimuli that the sense organs in the human body can detect.

1

2

3 [3]

(c) A student picks up a very hot object and immediately drops it.

Describe what happens in this reflex action.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 9]

8 Fig. 8.1 shows the apparatus used for investigating the contents of cigarette smoke.

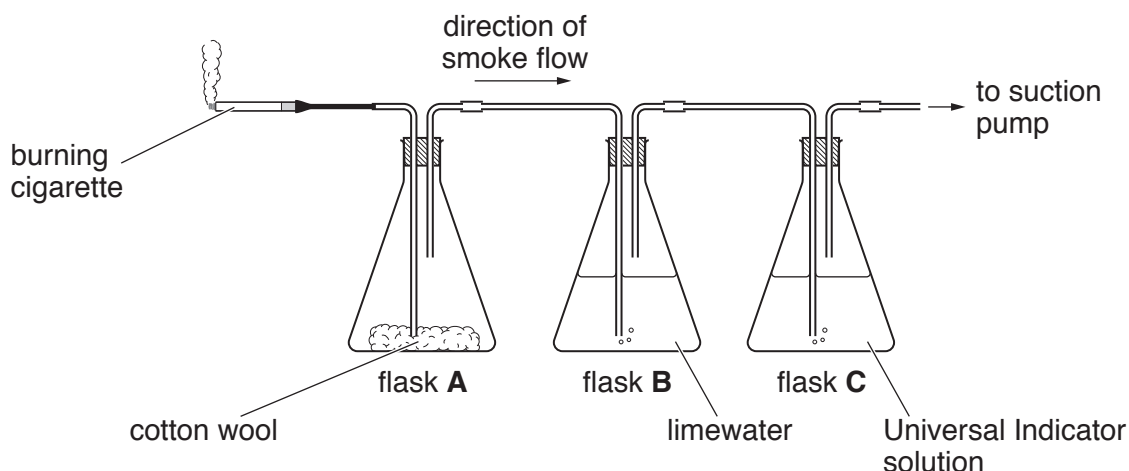


Fig. 8.1

The smoke from the burning cigarette is sucked through the apparatus.

Table 8.1 shows the results.

Table 8.1

flask	contents of flask	observations
A	cotton wool	stained yellow-brown with a sticky liquid
B	limewater	turned from colourless to milky
C	Universal Indicator solution	turned from green to orange-red

(a) (i) The chemical from the smoke that stained the cotton wool was tar.

State **two** effects tar has on the body.

1

.....

2

.....

[2]

(ii) State **one** conclusion that can be made from the limewater results.

.....

.....

[1]

(iii) State what the Universal Indicator results show about cigarette smoke.

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

(iv) Name **one** component of cigarette smoke, other than tar and carbon monoxide, **not** found in this investigation.

..... [1]

(b) The cigarette had a filter to collect harmful substances, but it did not work very well.

Suggest how the results in Table 8.1 show that the filter did not work very well.

..... [1]

(c) Explain why cigarette smoke makes the transport of oxygen by the blood less effective.

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

[Total: 8]

Abbreviations used in the Mark Scheme:

;	separates marking points
/	alternatives
I	ignore
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
AW	alternative wording (where responses vary more than usual)
AVP	any valid point
ecf	credit a correct statement / calculation that follows a previous wrong response
ora	or reverse argument
()	the word / phrase in brackets is not required, but sets the context
<u>underline</u>	actual word given must be used by candidate (grammatical variants excepted)
max	indicates the maximum number of marks that can be given

Question	Answer			Marks
3 (a)	label	name	function	[6]
	F	capillary ; (I vein / artery)	transports blood/ heat/ supplies oxygen glucose to cells /removes carbon dioxide;	
	G	receptors / <u>sensory</u> neurone ;	detect changes in external environment / stimulus / touch / pressure / temperature; (R detects temperature of the blood; I responds to)	
	H			
	J	adipose tissue/ fat / fatty tissue; (I fatty acids; I dermis)	insulation/prevention of heat loss / keeps body warm/ shock absorber/ energy store;	
3 (b) (i)	with no back-pack 6 (arbitrary units); with 9kg back-pack 13 (arbitrary units); 117(%); (I 116.6%)			[3]
3 (b) (iii)	more/ increased volume of, sweat produced;			[1]
3 (c)	1 ref. to <u>evaporation</u> ; (I ref. to heat loss by conduction/ convection / radiation 2 (of) water/ sweat ; 3 (idea of) need for heat/ latent heat/ energy ; (I sweat absorbs heat unqualified) 4 (heat/ latent heat/ energy for evaporation) taken from / body/skin/ blood; 5 blood carries heat ;			[max 3]
[Total: 13]				

Question	Answer	Marks
8 (a)	brain; spinal cord;	[2]
8 (b)	(A position of body in space/AW; I named sense organs) light; sound; chemicals; temperature (change); object touching skin; pressure against skin; damage to skin;	[max 3]
8 (c)	heat / stimulus detected by sensors /receptors, impulse (generated); passed along sensory neurone; across synapse (somewhere in account); impulse passed to motor neurone, via relay /AW neurone; impulse causes muscles to contract/respond;	[max 4]
[Total: 9]		

Question	Answer	Marks
8 (a)(i)	causes (lung) cancer/AW; causes bronchitis; increased mucus production / more goblet cells / cough; reduces gaseous exchange / coats the alveoli /narrows the lumen of the airways; stops cilia working /AW; stains teeth and fingers;	[2]
8 (a) (ii)	(cigarette smoke) contains carbon dioxide;	[1]
8 (a) (iii)	(cigarette smoke) is acidic /has a low pH;	[1]
8 (a) (iv)	nicotine; (A particulates)	[1]
8 (b)	(A many substances pass through the filter) yellow/ brown / sticky / stained, cotton wool or milky limewater or red Universal Indicator;	[1]
8 (c)	haemoglobin /red blood cells / erythrocytes, carry / transport, oxygen; carbon monoxide combines with haemoglobin; ref. to permanent bond; (carbon monoxide binding to haemoglobin) prevents O ₂ from binding to haemoglobin /AW;	[2]
[Total: 8]		