

(Health and disease (non-communicable diseases, risk factors, cancer))

Q1.(2018)

fat

Q2.(2018)

type 2 diabetes

Q3.(2018)

- two groups of people - non-smokers and smokers
- have at least five people in each group or large groups
- get each person to do (named) exercise
- controlled variables:
 - same number of people in each group or large groups
 - same gender
 - same level of activity / exercise
 - same age
 - no health issues / illnesses
 - same type of exercise
 - same time for exercise
- record heart rate for each person before and after exercise
- calculate increase in heart rate for each person after exercise
- compare results for each group

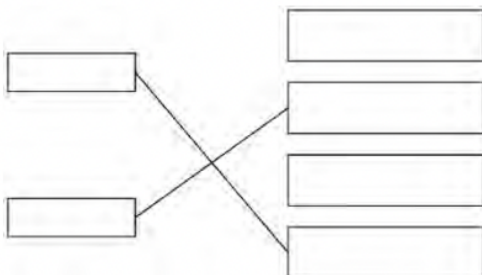
for **level 3**, students should refer to at least 5 smokers and 5 non-smokers, carrying out exercise with control variables and a means of determining an increase in heart rate

for **level 2**, students should refer to 'groups' of smokers and non-smokers exercising

Q4.(2019)

C

Q5.(2019)



Q6.a)(2021)

D

Q6.b)(2021)

B

Q6.c)(2021)

is more likely to get a blockage
(with high cholesterol)

or

blockage could be biggest

Q6.d)(2021)

4 and 5.6

$$\left(\frac{5.6}{4}\right) = 1.4$$

Q7.a)(2021)

normal

Q7.b)(2021)

$$92 \div 1.71^2$$

31.46(...)

31.5

Q7.c)(2021)

any **two** from:

- the higher the BMI (category)
the lower the number of years
living in good health
- the higher the BMI (category)
the higher the number of
years living in bad health
- the higher the BMI (category),
the lower total life expectancy

Q8.(2021)

Organisation

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costs the NHS / UK health
service / Government / hospitals
more money

(because need to pay for)
additional surgery / medication /
hospital stay to treat stroke /
diabetes

or

more time off work (if in hospital
/ unwell) (1)

(so) employer / Government
have to give financial support (1)

Q9.(2021)

allow any **one** from:

- movement issues
 - loss of job / income
 - disability
 - mental health impact of lack
of movement
- or**
- mental health impact of pain
 - need to visit the doctor / take
medication regularly
 - may need surgery

Q10.(2021)

type 2 diabetes

CVD / CHD

or

heart attack / disease

or

stroke

Q11.(2023)

division

Q12.(2023)

malignant tumours have cells
that can spread to other parts of
the body

malignant tumours may form
secondary tumours

Q13.(2024)

ionising radiation

viruses

Q14.a)(2024)

any **two** from:

- smoking increases the (%) risk of **all** types of (cardiovascular) disease
- smoking increases the (%) risk of having (disease) **H** more than any other type of (cardiovascular) disease
- smoking increases the (%) risk of having (disease) **E** less than any other type of (cardiovascular) disease

Q14.b)(2024)

y-axis labelled 'Percentage / %
increase in risk (compared to
people who have never
smoked)'

correct scale of 1 cm = 5% on
y-axis

all bars plotted correctly

all bars correctly labelled

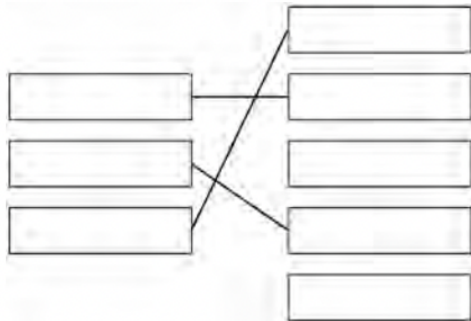
Q14.c)(2024)

any **one** from:

- poor diet
- lack of exercise

(The circulatory system (heart, blood vessels, blood))

Q1.(2018)



Q2.(2018)

C

Q3.(2018)

(vessel) B

**thick walls or thick muscle /
elastic tissue
or
lumen is small / narrow**

Q4.a)(2018)

95

Q4.b)(2018)

**(because coronary) arteries /
they are narrower**

Q4.c)(2018)

$250 \times 60 (= 15\,000)$

**or
15 000**

15

Q5.a)(2018)

any **two** from:

- no need to stay as long in hospital (after procedure)
or can go home sooner / same day
- not as / less invasive
or no need for a major operation
or no need for general anaesthetic
- shorter recovery time
or can get back to normal lifestyle quicker
or less time needed off work
- lower risk of a heart attack (during procedure)

Q5.b)(2018)

lower chance of failure (within one year)

only need one operation to treat multiple blockages **or** can treat multiple blockages at one time

Q6.(2019)

pulmonary artery

Q7.a)(2019)

circulatory / circulation (system)

Q7.b)(2019)

any valve ringed



Q7.c)(2019)

prevent backflow (of blood)

or

ensure one-way flow

Q7.d)(2019)

vein

Q8.a)(2019)

any **two** from:
(referring to mechanical
valves)

- long lasting
or
durable
or
does not break / tear
or
does not wear out
- do not need to go into
hospital / surgery again
- no ethical issues
(surrounding use of living
/ animal tissue)
- no risk of rejection
- no need for anti-rejection
/ immunosuppressant
drugs
- no risk of transmission of
disease

Q8.b)(2019)

no need to take anti-clotting
medication

Q9.a)(2020)

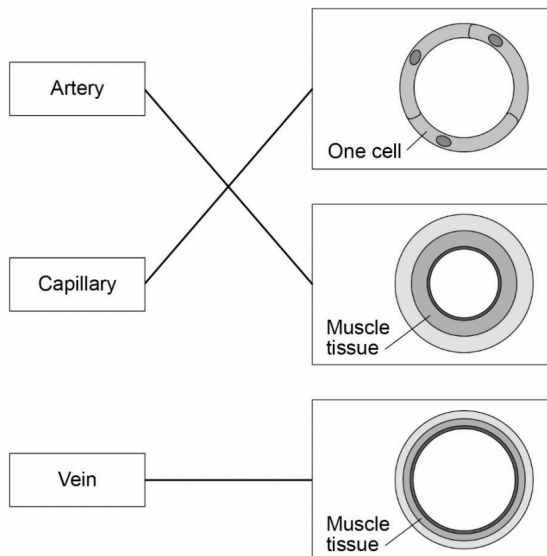
Organisation

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all lines correct = 2 marks
1 or 2 lines correct = 1 mark

Type of blood vessel

Structure of blood vessel



additional line from a box on the left negates the credit for that box

Q9.b)(2020)

any **one** from:

- thick(er) (muscle) walls / tissue (1)

to push blood (all) around the body (1)

or

- thick(er) elastic walls / tissue (1)

to maintain / withstand high (blood) pressure

or to retain / regain shape (1)

or

- narrow lumen (1)

to maintain high (blood) pressure (1)

Q10.(2020)

(A) – white (blood) cell(s)

(B) – platelet(s)

Q11.(2021)

less blood flows through **or** less
blood flows to the heart (muscle
/ cells / tissue)

less oxygen (reaches the heart
muscle)

Q12.a)(2021)

opens / widens (artery)

so (more) blood can flow
through

Q12.b)(2021)

platelets

Q12.c)(2021)

Advantages:

- **only** have to take the tablet once a day
- **only** a tablet so easy to take **or only** a tablet so not painful to take
- (drugs are effective so) less likely to get a blood clot
- drugs are cheap so less cost to NHS **or** drugs are cheap so (more) people can afford them
- drugs have been used for a long time so must be safe / trusted

Disadvantages:

- patients have to make sure they always have a supply of drugs
- patients could forget to take the drugs (every day)
- patients could still get a blood clot in the first week
- restrictions on lifestyle because patients have to have a blood test every few weeks
- restrictions on lifestyle because patient can't eat certain foods
- patients may get a blood clot if they eat the wrong food
- risks associated with puncturing skin / infection
- patient may have a fear of needles
- higher risk of bleeding / bruising

Q13.a)(2023)

A

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Q13.b)(2023)

C

Q13.c)(2023)

right atrium

Q14.(2023)

any **two** from:

- (artery) has a thicker muscle (tissue)
- (artery) has a thicker elastic (tissue)
- (artery) has a narrower lumen
- (artery) does not contain valves

Q15.a)(2023)

as the percentage of the (coronary) artery that is blocked increases, blood flow decreases

Q15.b)(2023)

scale on y-axis

all points plotted

correct curved line of best fit

Q15.c)(2023)

correct answer from student's line in **Figure 7**

Q15.d)(2023)

- reduced blood flow to heart (muscle / tissue / cells)
- (so) less oxygen to heart (muscle / tissue / cells)
- (so) less glucose to heart (muscle / tissue / cells)
- (so) less (aerobic) respiration (in heart / body cells)
- (more) anaerobic respiration
- (so) less energy (released)
- (so) less muscle contraction
- (so) less blood / oxygen / glucose around the body (from heart)
or slower flow of blood / oxygen / glucose to body (from heart)
- less carbon dioxide removed from body (muscle / tissue / cells)
- (resulting in) breathlessness
- (resulting in) tiredness
- (anaerobic respiration causes) production of lactic acid
- (build-up of lactic acid) causes muscle fatigue / pain or chest pain

For **Level 3**, students must explain the effect of reduced oxygen / glucose on respiration or energy release and its consequence

Q15.e)(2023)

any **one** pair from:

- (insert) stent(s)
(to) open (coronary) artery
- (prescribe) statins (1)
(to) reduce (blood)
cholesterol (1)
- heart (and lung) transplant (1)
(to) replace the diseased
heart with a healthy heart (1)
- use an artificial heart (1)
(to) keep the patient alive
while waiting for a transplant
(1)
- (artery / heart) bypass (1)
(to) divert blood around the
blockage (1)

Q16.(2024)

arteries

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Q17.a)(2024)

pushes / moves blood

to get oxygen around the body

Q17.b)(2024)

provides oxygen (for respiration)

Q17.c)(2024)

statin(s)

Q17.d)(2024)

(stent) opens / widens (blocked
blood) vessel

to allow (more) blood to flow

or

to allow (more) glucose / oxygen
to the heart (cells / tissue /
muscle)

(Transport in plants (transpiration, translocation, potometer practical))

Q1.a)(2018)

phloem

Q1.b)(2018)

translocation

Q2.a)(2019)

evidence of correct graph
readings (5 and 1)

4 (cm³)

Q2.b)(2019)

plant A has more leaves

Q2.c)(2019)

any **one** from:
(the new room was)

- windier
- warmer
- drier / less humid
- brighter

Q3.(2021)

**the plant will not lose as much
water**

Q4.(2022)

xylem

stomata

phloem

Q5.a)(2022)

310

254

1.22047...

1.2

Q5.b)(2022)

each leaf of species **A** has more stomata

Q5.c)(2022)

increased temperature

Q5.d)(2022)

C

Q6.(2024)

transpiration

Q7.(2024)

lignin

(The respiratory system (lungs and gas exchange))

Q1.(2019)

D

Q2.(2019)

trachea

Q3.(2020)

- (many) alveoli
 - provide a large(r) surface area (: volume)
- capillaries are thin
 - or alveoli / capillary walls are thin or one cell thick
 - or capillaries are close to the alveoli
 - which provides short diffusion path (for oxygen / carbon dioxide)
- breathing (mechanism) moves air in and out
 - or lungs are ventilated
 - to bring in (fresh) oxygen
 - to remove carbon dioxide
 - to maintain a concentration / diffusion gradient
- large capillary network (around alveoli)
 - or good blood supply
 - to remove oxygen(ated blood) quickly
 - to bring carbon dioxide to the lungs quickly
 - to maintain a concentration / diffusion gradient

Q4.a)(2021)

trachea

Q4.b)(2021)

any **two** from:

- only one air space (per balloon)
or
alveoli not represented
- blood vessels / capillaries not represented
- bronchioles not represented

- glass tube not flexible (like trachea / bronchi)
- bell jar does not move during breathing (like ribs)
- ribs have gaps between them
- rib cage contains muscles
- pleural cavity not represented

Q5.(2022)

gills

Q6.(2022)

- large number of alveoli
- large surface / area

- alveolus and blood vessel / capillary are in close proximity
- alveoli / capillaries have thin walls **or** alveoli / capillaries have walls that are one cell thick
- to reduce diffusion distance

- has a good blood supply **or** has a capillary network
- to maintain concentration gradient
- to remove oxygen quickly **or** to deliver carbon dioxide quickly
- (capillary network) increases surface area (for diffusion)

- lungs are ventilated **or** lungs continually move air in and out
- (ventilation) brings in oxygen **or** removes carbon dioxide
- to maintain concentration gradient

Types of adaptation of the lungs are required for **Level 3**.