

Past-paper walk-through

Sexual reproduction in humans ■ 16.4

eXercise

Questions in this set

- 0610/22 N25 Q26 ■ 1 mark
- 0610/22 N25 Q27 ■ 1 mark
- 0610/23 N25 Q28 ■ 1 mark
- 0610/43 N25 Q6 ■ 8 marks
- 0610/23 J25 Q8 ■ 1 mark
- 0610/42 M25 Q4 ■ 10 marks

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 26

0610/22 N25 ■ Q26 ■ 1 mark

- 26** Which statement describes the net direction of movement of a substance across the placenta?
- A** Carbon dioxide moves from the mother's blood to the fetus's blood.
 - B** Glucose moves from the fetus's blood to the mother's blood.
 - C** Glycogen moves from the mother's blood to the fetus's blood.
 - D** Urea moves from the fetus's blood to the mother's blood.

Solution 26

Answer: **D**

Why

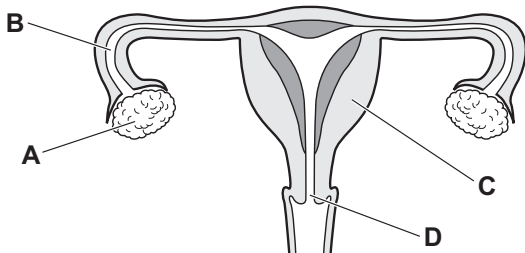
- The fetus needs oxygen and glucose, so those move from mother to fetus.
- The fetus produces carbon dioxide and urea, so those move from fetus to mother.
- So each substance moves down its own concentration gradient, in the direction the fetus needs.

Question 27

0610/22 N25 ■ Q27 ■ 1 mark

27 The diagram shows the human female reproductive system.

Which label identifies the uterus?



Question 27

Solution 27

Answer: **C**

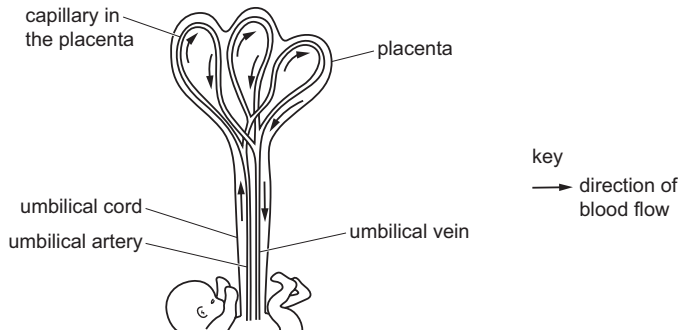
Why

- The uterus is the thick-walled muscular chamber where the fetus develops.
- Above it the two oviducts lead to the ovaries.
- Below it the narrow cervix opens into the vagina.

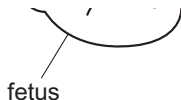
Question 28

0610/23 N25 ■ Q28 ■ 1 mark

28 The diagram shows the blood supply between a fetus and a placenta.



Question 28



Which row shows the concentration of substances in the umbilical artery and umbilical vein?

	umbilical artery	umbilical vein
A	high nutrient concentration	high urea concentration
B	high urea concentration	high carbon dioxide concentration
C	low carbon dioxide concentration	low nutrient concentration
D	low oxygen concentration	low urea concentration

Solution 28

Answer: **D**

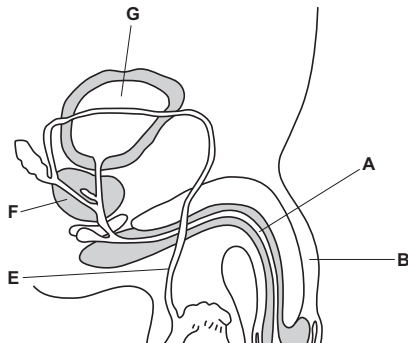
Why

- The umbilical *artery* carries blood away from the fetus, towards the placenta.
- So it carries the deoxygenated blood, loaded with carbon dioxide and urea.
- The umbilical vein brings oxygenated, glucose-rich blood back to the fetus – the reverse of the usual artery/vein rule.

Question 6

0610/43 N25 ■ Q6 ■ 8 marks

- 6 (a) Fig. 6.1 is a diagram of the human male reproductive system.



Question 6

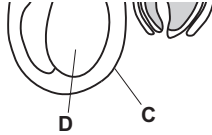


Fig. 6.1

Table 6.1 contains information about the male reproductive system shown in Fig. 6.1.

Complete Table 6.1.

Table 6.1

letter in Fig. 6.1	name of the structure	function
	scrotum	

Question 6

		produces seminal fluid
		transports urine and sperm
E		

[4]

(b) State the name of the hormone that causes voices to deepen at puberty.

Question 6

(c) Sperm have adaptive features to carry out their function.

Explain **three** adaptive features of sperm.

Question 6

Question 6

Question 6

[3]

[Total: 8]

Solution 6

(a) Mark scheme

- letter in Fig. 6.1
- name of the
- structure
- function
- C
- scrotum
- contains / protects / holds / AW,
- testes / D

Solution 6

- F
- prostate gland
- produces seminal fluid
- A
- urethra
- transports urine and sperm
- E
- sperm duct
- transport sperm (to urethra)
- ;;;;

Solution 6

- 4 one mark per correct row
- 0610/43
- October/November 2025
- Guidance

Solution 6

(b)

Mark scheme

- testosterone ;
- 1

Solution 6

(c) Mark scheme

- any three from:
- 1
- flagellum / flagella, for, moving / swimming ;
- 2
- mitochondria to release energy for, moving / swimming ;
- 3
- acrosome to contain enzymes ;
- 4

Solution 6

- enzymes to break down the jelly (coat of the egg) ;
- 5
- haploid nucleus for fusing with the egg nucleus ;
- 6
- streamlined, shape / head, for swimming / AW ;
- 3

Question 8

0610/23 J25 ■ Q8 ■ 1 mark

- 8 The diagram shows the direction of **net** movement of two substances across a human placenta.



Which tissue represents maternal blood and which substance is identified correctly?

	tissue that represents maternal blood	substance that is identified correctly
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Question 8

A	P	1 = carbon dioxide
B	P	2 = urea
C	Q	1 = amino acids
D	Q	2 = starch

Solution 8

Answer: **B**

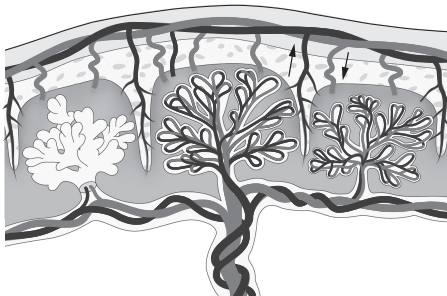
Why

- Substances the fetus needs – oxygen and glucose – move from mother to fetus.
- Waste such as carbon dioxide and urea moves the other way.
- So the tissue that substance 1 leaves and substance 2 enters is the maternal side.

Question 4

0610/42 M25 ■ Q4 ■ 10 marks

- 4 (a) Fig. 4.1 shows part of a human placenta and umbilical cord. The arrows show the direction of blood flow.



Question 4

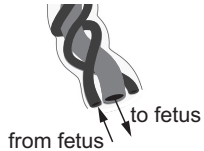


Fig. 4.1

- (i) Describe the functions of the placenta and the umbilical cord shown in Fig. 4.1.

Question 4

- (ii) A fetus develops inside an amniotic sac.

Describe the functions of the amniotic sac and amniotic fluid.

Question 4

- (b) Syphilis is a sexually transmitted infection (STI) that can be passed from a mother to her fetus.
 - (i) State the name of **one** other STI that can be passed from mother to fetus.

Question 4

(ii) State **two** ways to control the spread of STIs.

Question 4

[2]

[Total: 10]

Solution 4

(a)(i) Mark scheme

- 1
- maternal and fetal blood are kept separate / AW ;
- plus any three from:
- 2
- umbilical cord / placenta, transfers named substance, from mother / to
- fetus ;
- 3
- umbilical cord / placenta, transfers named substance, from fetus / to

Solution 4

- mother ;
- 4
- umbilical cord / placenta, transfers, antibodies / passive immunity, from
- mother / to fetus ;
- 5
- placenta forms barrier to, toxins / pathogens ;
- 6
- placenta secretes, progesterone / oestrogen ;
- 7
- AVP ;

Solution 4

■ 4

Solution 4

(a)(ii) Mark scheme

- any three from:
 - 1
 - protects, (fetus) against (mechanical) damage ;
 - 2
 - regulation of temperature ;
 - 3
 - allows fetus to move / allows muscle or bone development ;
 - 4

Solution 4

- protects fetus from infection / provides antibodies ;
- 5
- allows lung development ;
- 6
- sac produces amniotic fluid ;
- 7
- AVP ;
- 3

Solution 4

(b)(i)

Mark scheme

- HIV / named STI ;
- 1

Solution 4

(b)(ii) Mark scheme

- any two from:
- (named) barrier method of contraception / condom / femidom ;
- abstinence ;
- (regular) testing / screening ;
- education ;
- tracing sexual partners ;
- use of antibiotics ;
- vaccination ;

Solution 4

- AVP ;;
- 2
- 0610/42
- February/March 2025
- Guidance