

11.4 Sexual Reproduction

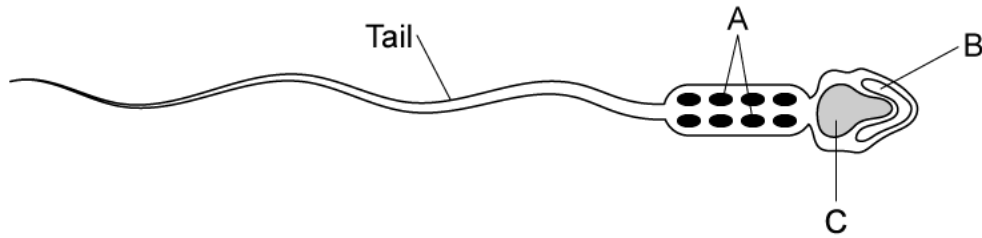
Question Paper

Course	DP IB Biology
Section	11. Animal Physiology (HL Only)
Topic	11.4 Sexual Reproduction
Difficulty	Easy

Time allowed: 60
Score: /45
Percentage: /100

Question 1a

a)
The diagram below shows the structure of a mature human sperm cell.



Identify structures **A-C**.

[3 marks]

[3 marks]

Question 1b

b)
Describe the role of structure **A** within the sperm cell shown in part a).

[2 marks]

[2 marks]

Question 1c

c)
A sperm cell is an example of a haploid cell.

i)
Define the term **haploid**.

[1 mark]

ii)
Explain the importance of a sperm cell being haploid.

[1 mark]

[2 marks]

Question 1d

d)
Structure **B** in part a) assists with the process of fertilisation.

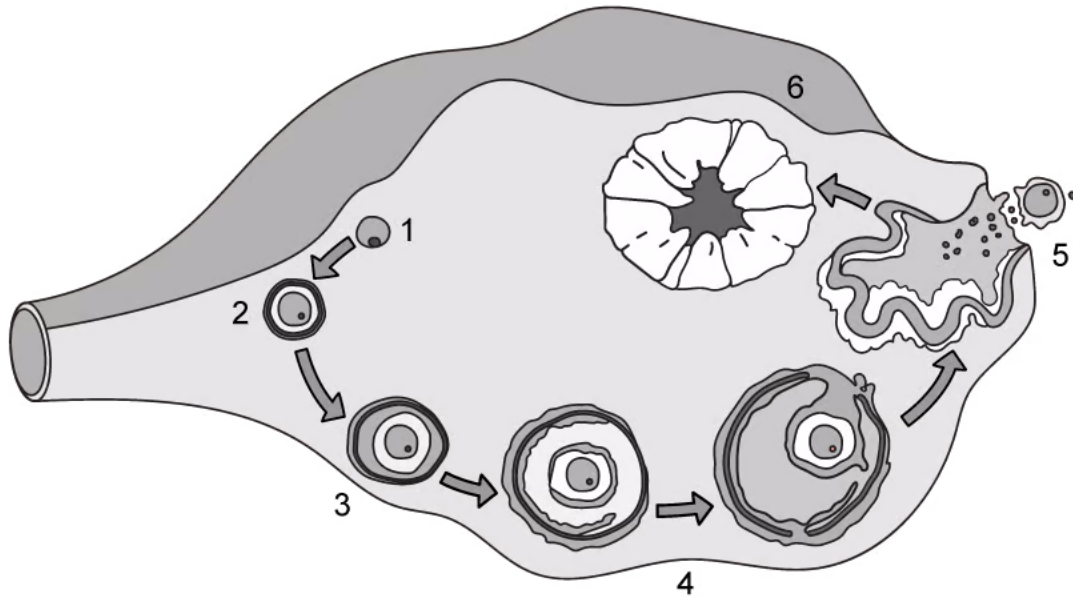
Identify the substances contained within structure **B** that assist with fertilisation.

[1 mark]

[1 mark]

Question 2a

a)
The following diagram shows the process of oogenesis in a human ovary.



Identify the structure present at stage 2 in the diagram.

[1 mark]

[1 mark]

Question 2b

b)
Describe what is happening to the structure identified in a) between steps 3 and 4 in the diagram in part a).

[2 marks]

[2 marks]

Question 2c

c)
Identify **three** similarities between the processes of oogenesis and spermatogenesis.

[3 marks]

[3 marks]

Question 3a

a)

Humans are placental mammals.

Outline what is meant by the term **placental mammal**.

[2 marks]

[2 marks]

Question 3b

b)

The table below lists some of the substances that are transported across the placenta, as well as the names of some transport mechanisms.

Substance	Transport mechanism
Carbon dioxide and oxygen	
Glucose	
Antibodies	
Water	

endocytosis facilitated diffusion diffusion osmosis

Identify the transport mechanism for each of the substances by correctly matching them in the table.

[4 marks]

[4 marks]

Question 3c

- c)
The placenta primarily consists of finger-like projections called placental, or chorionic, villi.
Suggest why the number of these villi increases throughout the course of a pregnancy.

[1 mark]

[1 mark]

Question 3d

- d)
The placenta is also responsible for producing key pregnancy hormones.

- i)
Identify **one** hormone produced by the placenta.

[1 mark]

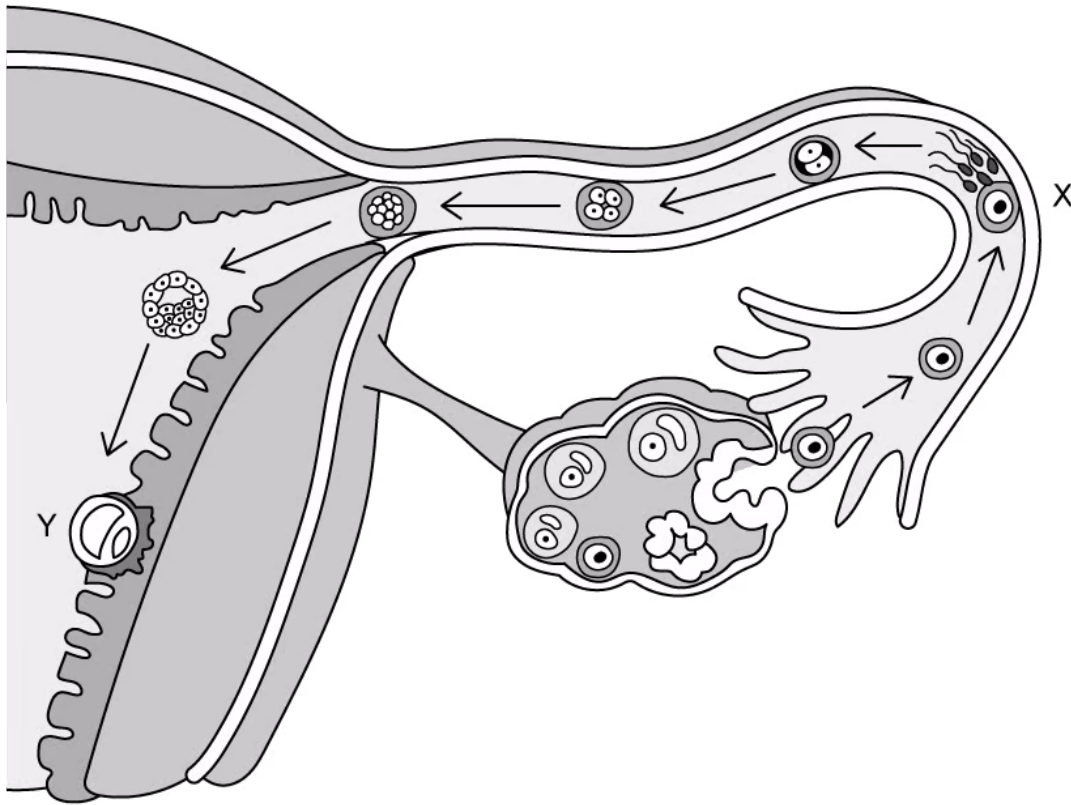
- ii)
State the function of the hormone identified in part i).

[1 mark]

[2 marks]

Question 4a

a)
The diagram below shows some of the events that can occur in the female reproductive system after ovulation.



Identify the events occurring at X and Y in the diagram.

[2 marks]

[2 marks]

Question 4b

b)
Event X involves a series of mechanisms that prevent polyspermy.

Define the term **polyspermy**.

[1 mark]

[1 mark]

Question 4c

c)

One of the mechanisms that prevents polyspermy is known as the cortical reaction.

Describe the steps of the cortical reaction.

[2 marks]

[2 marks]

Question 4d

d)

Process Y is essential for pregnancy to occur.

Explain the importance of process Y.

[2 marks]

[2 marks]

Question 5a

One mark is available for clarity of communication throughout this question.

a)

Describe the secretion and role of human chorionic gonadotropin (hCG) in early pregnancy.

[4 marks]

[4 marks]

Question 5b

b)

The process of childbirth occurs in several stages.

Outline the events that occur during childbirth.

[7 marks]

[7 marks]

Question 5c

c)

Draw an annotated diagram of a mature human ovum.

[4 marks]

[4 marks]



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