

6.6 Hormones, Homeostasis & Reproduction

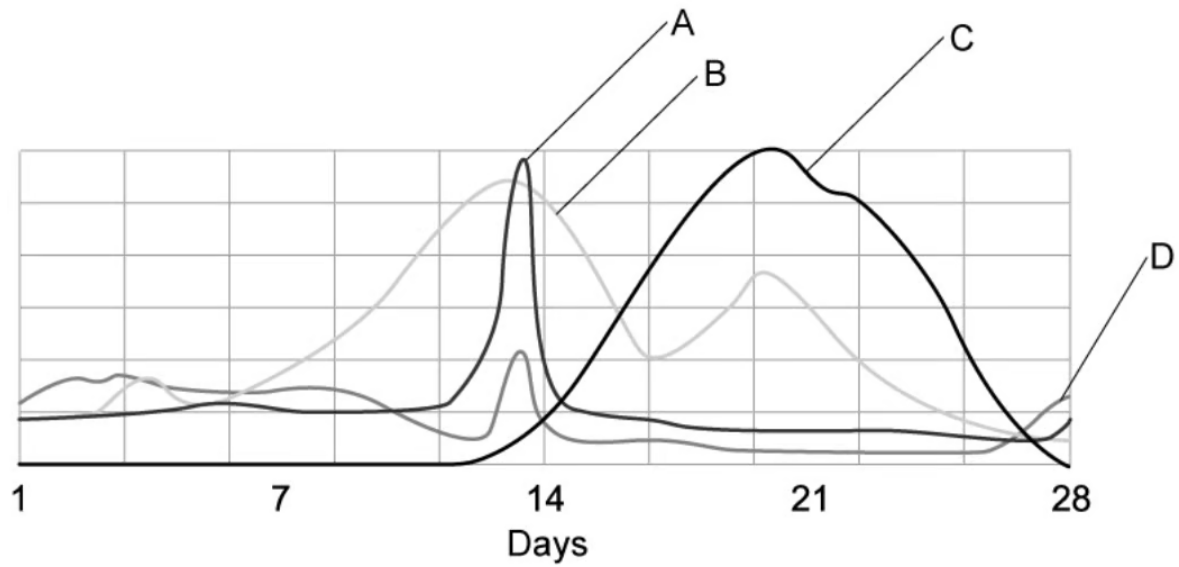
Question Paper

Course	DP IB Biology
Section	6. Human Physiology
Topic	6.6 Hormones, Homeostasis & Reproduction
Difficulty	Medium

Time allowed: 20
Score: /10
Percentage: /100

Question 1

The following graph shows the hormones involved in the menstrual cycle.



Which line represents the hormone responsible for ovulation?

- A** Line A.
- B** Line B.
- C** Line C.
- D** Line D.

[1 mark]

Question 2

Polycystic ovary syndrome (PCOS) is a condition which may affect certain women during their childbearing years. Some of the most common symptoms of this condition is a failure to ovulate and irregular menstrual cycles. Women with PCOS have an increased risk of developing endometrial cancer.

What would be the most appropriate explanation for this?

The endometrium will:

- A** Build up due to the lack of ovulation.
- B** Be shed too often.
- C** Build up due to the lack of menstruation.
- D** Be shed during ovulation.

[1 mark]

Question 3

A person is admitted to hospital after suffering a stroke. It was found that the suprachiasmatic nucleus in the hypothalamus of the brain was damaged by the event. This resulted in the pineal gland secreting less melatonin into the bloodstream.

Which of the following changes would be observed in the patient?

- A** Increased thirst and more frequent urination.
- B** Disrupted sleep patterns and increased irritability.
- C** Constantly feeling cold and weight gain.
- D** Fatigue and forgetfulness.

[1 mark]

Question 4

A condition known as congenital adrenal hyperplasia (CAH) may affect the development of the genitals in female fetuses. These children lack an enzyme necessary to produce the hormones cortisol and aldosterone. Without these hormones the fetus will produce more male sex hormones, such as testosterone, during their development.

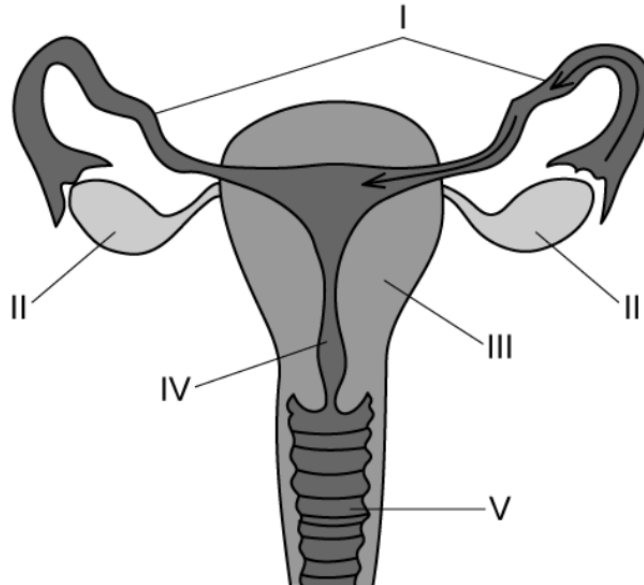
What effect would this have on the development of a female fetus?

- A** Sperm production would take place in the fetal gonads.
- B** Delayed development of fetal genitalia.
- C** Development of an abnormally large uterus.
- D** Difficulty in identifying the fetus as female.

[1 mark]

Question 5

The diagram shows the female reproductive system.



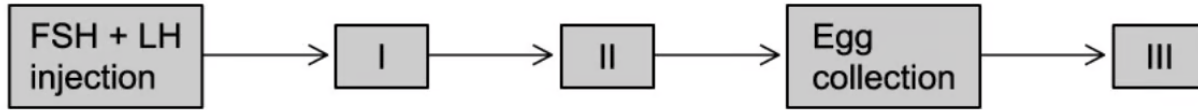
Which row correctly identifies the structures?

	I	II	III	IV	V
A	Oviduct	Ovary	Uterus	Vagina	Cervix
B	Ovary	Oviduct	Uterus	Vagina	Cervix
C	Oviduct	Ovary	Uterus	Cervix	Vagina
D	Oviduct	Ovary	Cervix	Uterus	Vagina

[1 mark]

Question 6

The following diagram shows the steps followed during *in vitro* fertilization.



Which row correctly identifies the steps?

	I	II	III
A	Ovulation	Fertilization	Egg washing
B	Ovulation	HCG injection	Fertilization
C	HCG injection	Ovulation	Fertilization
D	HCG injection	Egg washing	Fertilization

[1 mark]

Question 7

Which of the following are roles of thyroxin?

- I. Targets metabolically active regions, such as adipose tissue.
- II. Increase the rate of protein synthesis.
- III. Inhibits the appetite and reduces food intake.
- IV. Increase the generation of body heat.

- A** II only
- B** I and II only
- C** II and IV only
- D** I, II, III and IV

[1 mark]

Question 8

An obese patient participated in a drug trial to test the effectiveness of leptin injections to promote weight loss. After 12 weeks of receiving weekly leptin injections, the patient failed to lose any weight.

What could be the most plausible explanation for this outcome?

- A** Target cells in the hypothalamus failed to respond to the leptin injections.
- B** They have a mutation in the gene responsible for leptin synthesis.
- C** Target cells in adipose tissue failed to respond to leptin injections.
- D** Leptin is broken down too slowly by the body.

[1 mark]

Question 9

A one year old child displays fatigue and excessive thirst over a period of time. A urine test reveals the presence of glucose.

Which of the following would be the most likely diagnosis?

- A** Type I diabetes as the body is unable to respond to the presence of insulin.
- B** Type I diabetes as the beta cells in the islets of Langerhans were destroyed.
- C** Type II diabetes as the body does not have sufficient insulin receptors on target cells.
- D** Type II diabetes as the alpha cells in the islets of Langerhans was destroyed.

[1 mark]

Question 10

In which of the following scenarios would there be an increase in the breakdown of glycogen in the liver?

- A** When the beta cells of the islets of Langerhans secrete insulin.
- B** When the beta cells of the islets of Langerhans secrete glucagon.
- C** After eating a meal high in carbohydrates.
- D** When the alpha cells of the islets of Langerhans secrete glucagon.

[1 mark]