Name: _____

Trinity College

SCIENCE DEPARTMENT

YEAR 11
2B HUMAN BIOLOGY EXAMINATION

Short Answer Booklet

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work:	**Ten minutes**
Working time for paper:	**Three hours**

SECTION 1: **Multiple Choice – 40 Questions – 40 Marks – 40%**
Answer the multiple choice questions by crossing out the letter of your choice on the answer sheet provided.
Use a 2B pencil here.

SECTION 2: **Short Answers – 10 Questions – 90 marks – 40%**
Answer the questions in the spaces provided. Answers are to be in BLUE or BLACK ink.
GRAPHS and DRAWINGS to be in pencil and labelled in ink.

SECTION 3: **Extended Answer – 2 Questions – 40 marks – 20%**
Answer question 1 **OR** question 2

AND

Answer question 3 **OR** question 4.

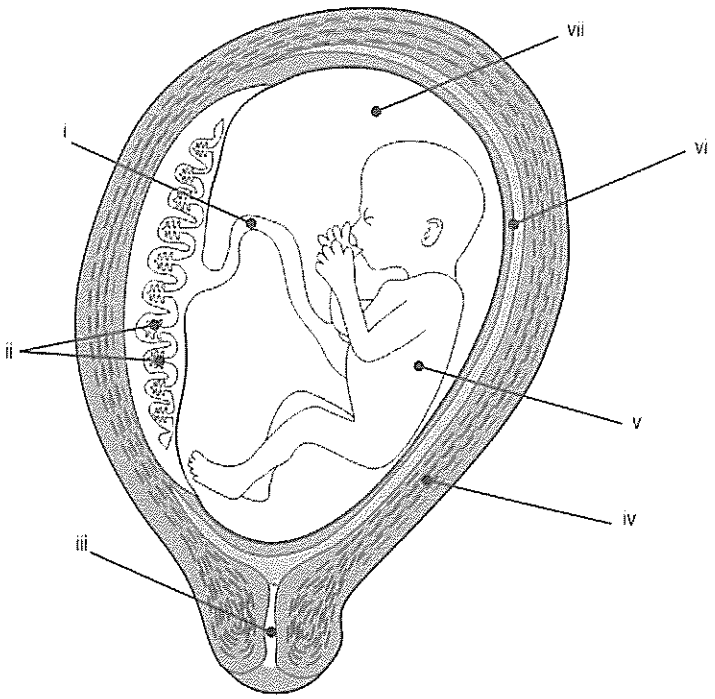
Section B: Short Answers (Total 90 marks)

(a) Give the term that best fits the description below. (5 marks)

1. The formation and development of the gametes.
   _____
2. The double walled cup like structure at the end of each of the kidney tubule.
   _____
3. An antigen preparation used in immunisation.
   _____
4. Possessing the same alleles for a given characteristic.
   _____
5. A method of removing wastes from the blood when kidney failure occurs.
   _____

(b) Write the definitions of the following terms. (5 marks)

6. Endometrium _____
7. Heterozygous _____
8. Nephron _____
9. Placebo _____
10. Ureter _____



1. Label the diagram above:

(i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____

(vi) _____

(vii) _____ (7 marks)

2. Describe the function of the following parts from the diagram in Question 1:

(ii) _____

_____

(iii) _____

_____

_____

(2 marks)

3. (i) Why is blood diverted away from the foetal lungs?

_____

_____

(1 mark)

(ii) Describe how blood is diverted away from the foetal lungs?

_____

_____

_____

_____

(3 marks)

4. (i) Which part of the baby is normally delivered first?

_____

(ii) What hormone is involved in the contractions in parturition?

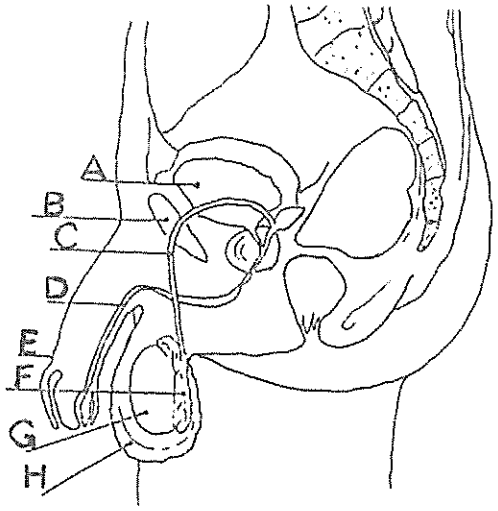
_____

(iii) Where is this hormone released from?

_____

(3 marks)

5. Refer to the diagram below.



(a) Label the following parts from the diagram above. (5 marks)

C	
D	
F	
G	
H	

(b) Which structure produces the hormone responsible for male secondary sexual characteristics? (1 mark)

(c) In which organ is mature sperm stored? (1 mark)

(d) Name the part of the male reproductive system which produces thin, milky, alkaline fluid. (1 mark)

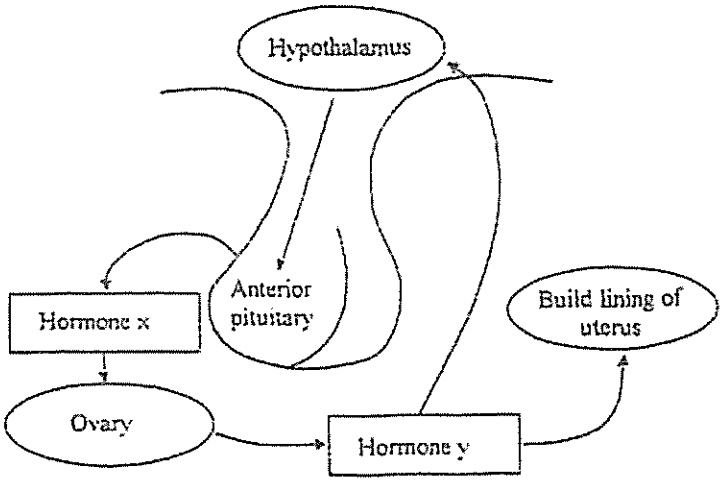
(e) Through which structure do sperm leave the body? (1 mark)

(f) The testes develop in the abdominal cavity then descend into the scrotal sac. Why is it necessary for the testes to descend into the scrotum? (1 mark)

(g) Vasectomy is an operation used to sterilise men. Explain what structures are operated on and how the technique prevents conception. (2 marks)

(h) Describe 2 modes of operation of a spermicide. (2 marks)

6. The diagram below shows partly how the hypothalamus regulates the menstrual cycle. Use this diagram to complete the questions below.



(a) Name and describe the function of hormone **X.** (3 marks)

(b) Name the main hormone which is produced from the ovary in the first half of the ovarian cycle? (1 mark)

(c) Around day 12-13 of the menstrual cycle the pituitary releases another hormone.

(i) What is it called? (1 mark)

(ii) What effect does this hormone have? (2 marks)

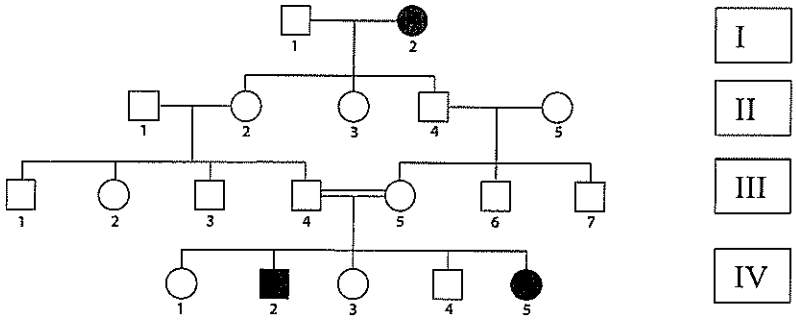
(d) The ovary secretes another hormone in increasing amounts after day 14 of the menstrual cycle. Name the hormone and state its purpose. (2 marks)

Hormone _____

Purpose _____

_____

7. The following questions relate to the pedigree below.



(a) What term describes the relationship between the individuals III.4 and III.5? (1 mark)

_____

(b) Is the disorder inherited as a recessive or dominant trait? (1 mark)

_____

(c) Explain how you arrived at your answer in (b)? (2 marks)

_____

_____

_____

(d) Is the trait more likely to be autosomal or sex linked? Explain how you arrived at your answer in (c). (3 marks)

_____

_____

_____

(e) Using the letters 'A' and 'a' to represent dominant and recessive alleles, write the full genotypes of Individual IV.2 (1 mark)

_____

(f) What is the chance that the newborn baby IV.5 has the disorder? (1 mark)

(g) The ABO blood grouping system displays two phenomena in genetics. Explain the following terms and give an example using the ABO system. (4 marks)

a. Multiple alleles

b. Co-dominance

(h) Apart from the ABO system, name ONE other blood grouping system. (1 mark)

8. A drug company has developed a new influenza vaccine that is squirted into the nasal passages. The vaccine has been approved for testing in people to see if it prevents the symptoms of influenza. Consider how an experiment might be designed to test this vaccine and answer the following questions.

(a) State a suitable hypothesis for this experiment. (1 mark)

(b) What would be the independent variable in the experiment? (1 mark)

(c) What is the dependent variable in the experiment? (1 mark)

(d) In this experiment, the subjects would be randomly assigned to two groups. Using your understanding of scientific method, what name would you use to describe each group and what would you give to the members of each group to test your hypothesis? (4 marks)

(e) List two variables that would need to be controlled in this experiment? (2 marks)

.....

.....

(f) What sort of immunity is being induced by the vaccine? (1 mark)

.....

9. The table below shows the percentage composition of certain materials in plasma and urine from a healthy individual.

Substance	Plasma %	Urine %
Water	90-93	95
Proteins & Fats	6.0	0.0
Glucose	0.1	0.0
Sodium	0.32	0.35
Potassium	0.02	0.15
Urea	0.03	2.0
Creatine	0.001	0.075

(a) Account for the following patterns between plasma and urine in the table by referring to nephron function and where in the nephron these processes are taking place

(i) The decrease in percentage composition for glucose. (2 marks)

_____

_____

(ii) The increase in percentage composition for urea. (3 marks)

_____

_____

_____

(b) Explain why the percentage composition of proteins and fats in urine is zero.

_____

_____

(2 marks)

(c) The metabolic waste product urea is produced by the process of deamination. Describe where and how the process occurs.

_____

_____

_____

_____

(3 marks)

10.

(a) Complete the following table.

Motor Development Type	Description
Cephalocaudal	
	Development outwards. Control of muscle/limbs close to the body and progressively towards the extremities until fine movement is obtained
Gross to Specific	

(3 marks)

(b) Describe 4 ways that HIV can be prevented from spreading from person to person.

1	
2	
3	
4	

(4 marks)

END OF SHORT ANSWER SECTION