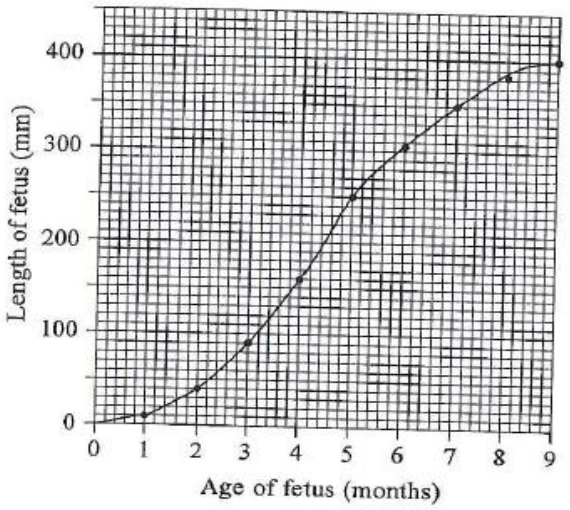
Reproduction 2

1. Which of the following forms of contraception causes thickening of cervical mucus?

   A Mini-pill
   B Barrier methods
   C Morning-after pill
   D Intra-uterine device

2. The graph below shows the growth in length of a human fetus before birth.



What is the percentage increase in length of the fetus during the final 4 months of pregnancy?

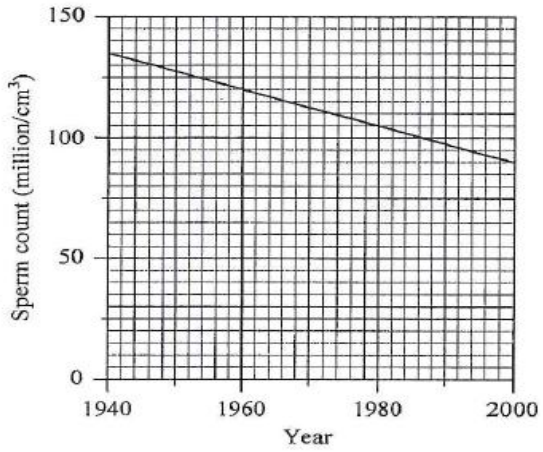
A 33.3

B 60.0

C 62.5

D 150.0

3. The sperm counts of a sample of men taken between 1940 and 2000 are shown in the graph below.



What is the average reduction in sperm count per year?

A 0.67 million/cm^3/year

B 0.75 million/cm^3/year

C 0.92 million/cm^3/year

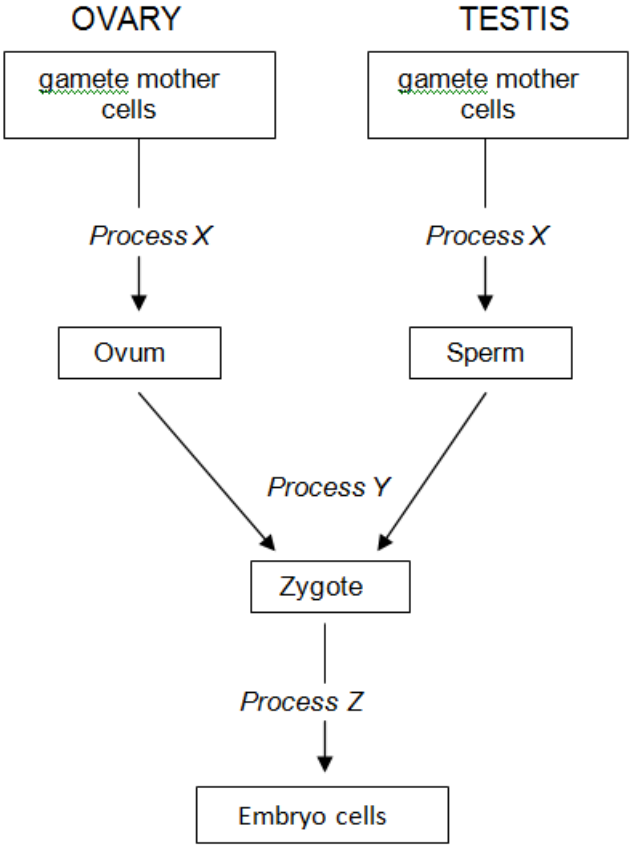
D 45 million/cm^3/year

4. The table below contains information about four semen samples

	Semen Sample			
	A	B	C	D
Number of sperm in sample (millions/cm^3)	40	30	20	60
Active sperm (percent)	50	60	75	40
Abnormal sperm (percent)	30	65	10	70

Which semen sample has the highest number of active sperm per cm^3?

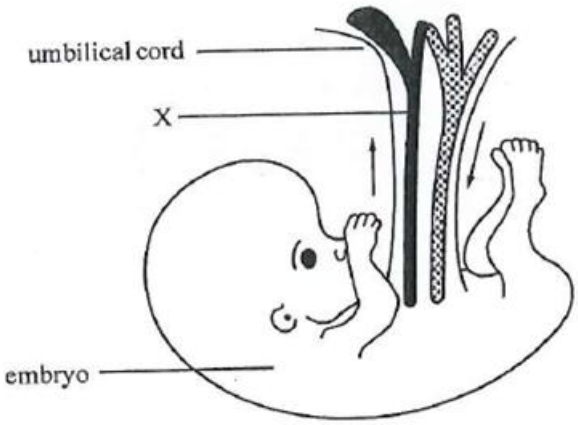
5. The diagram refers to human reproduction.



Which of the following correctly identifies processes X, Y and Z?

	X	Y	Z
A	mitosis	meiosis	fertilisation
B	meiosis	fertilisation	mitosis
C	meiosis	mitosis	fertilisation
D	mitosis	fertilisation	meiosis

6. The diagram below shows the blood flow in the umbilical cord.

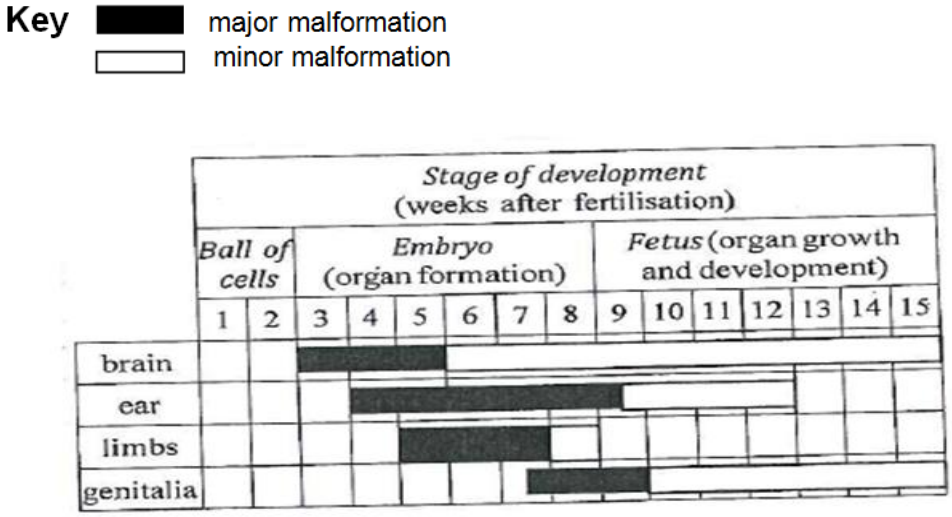


Which line in the table below identifies correctly blood vessel X and the blood it carries?

	Blood vessel X	Blood carried in X
A	vein	deoxygenated
B	vein	oxygenated
C	artery	deoxygenated
D	artery	oxygenated

7. Nicotine is a chemical which may affect pre- natal development.

The diagram shows the stages of development when major and minor malformations of organs may occur if there is exposure to nicotine.



For how many weeks during pregnancy is there a possibility of major malformations to organs during development?

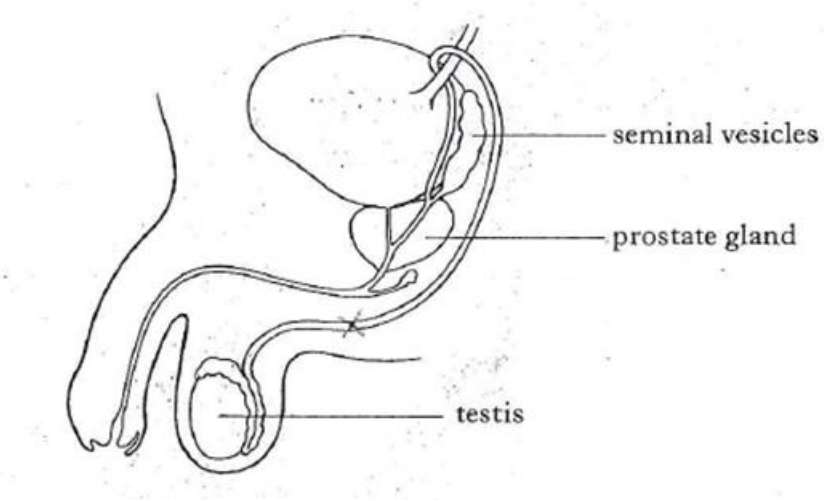
A 6

B 7

C 9

D 13

8. The diagram shows a section through the reproductive organs of a man.



(a) (i) State the site of sperm production within the testis.

_____ 1

(ii) State **one** function of the secretions from the seminal vesicles and prostrate gland.

_____

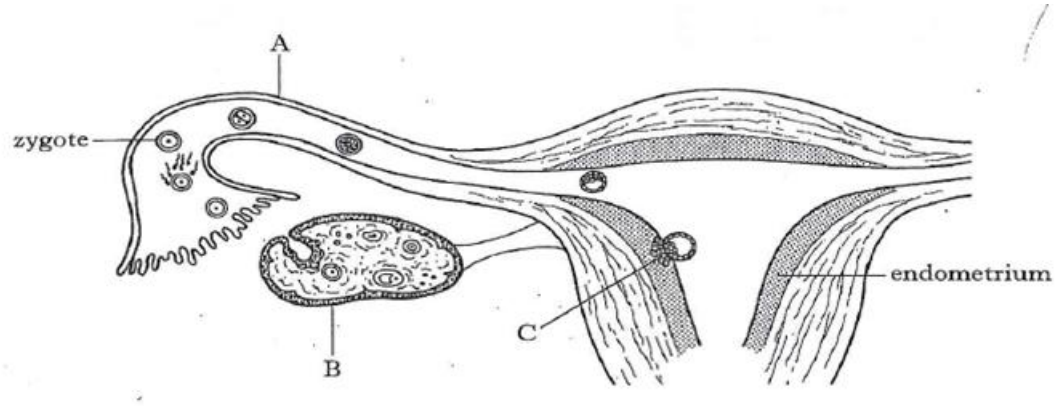
_____

(b) (i) During a male sterilisation operation (vasectomy), a tube is cut.
Draw a letter X on the diagram to indicate the likely position of the cut. 1

(ii) Why is the transport of testosterone from the testes unaffected by this operation?

_____ 1

9. The diagram shows stages in the development of a human embryo from fertilisation to implantation.



(a) Name the parts labelled **A** and **B.**

A _____ B _____ 1

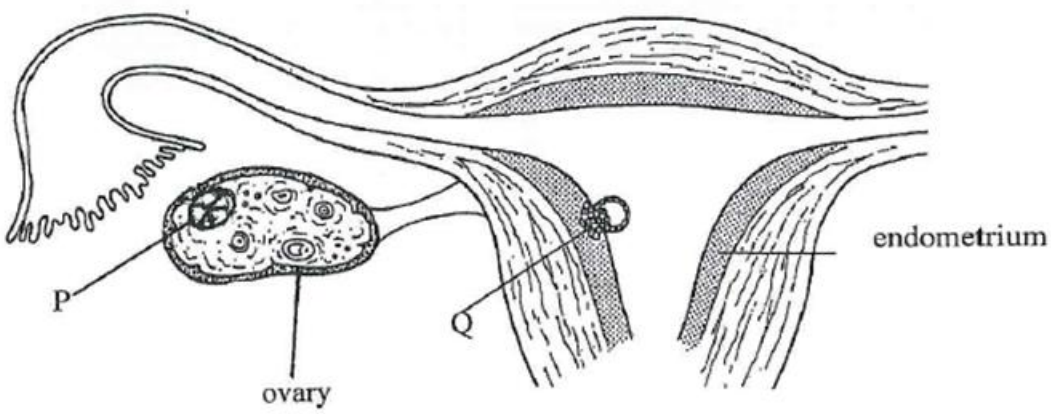
(b) Name a hormone which is involved in preparing the endometrium for implantation and state where it is produced.

Hormone _____ Produced by _____ 1

(c) What organ will develop from the tissue labelled C?

_____ 1

10. The diagram shows part of the reproductive system of a woman in early pregnancy.



(a) Place an X on the diagram to show where fertilisation occurred. 1

(b) Structure P produces progesterone at this stage in pregnancy.

(i) Name structure P.

_____ 1

(ii) State **one** function of progesterone during early pregnancy.

_____

_____

(c) In the early stages of pregnancy the cells of the embryo are starting to differentiate.

Describe what happens during differentiation.

_____

_____ 1

11 . Which of the following will **not** normally pass through the placenta between the mother and fetus?

A Oxygen

B Minerals

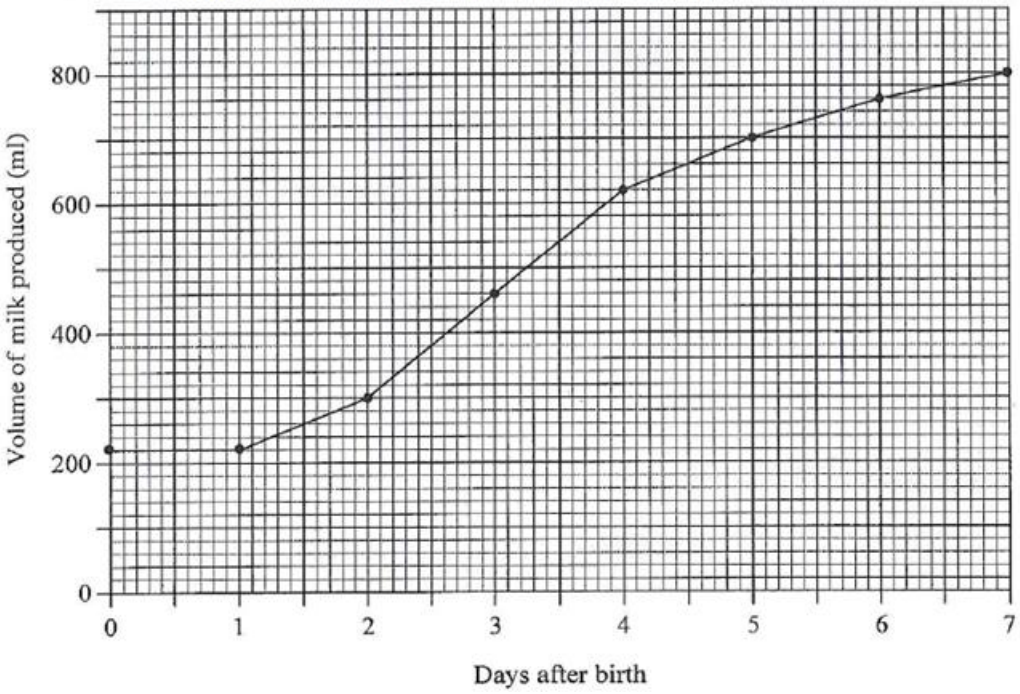
C Glucose

D Red blood cells

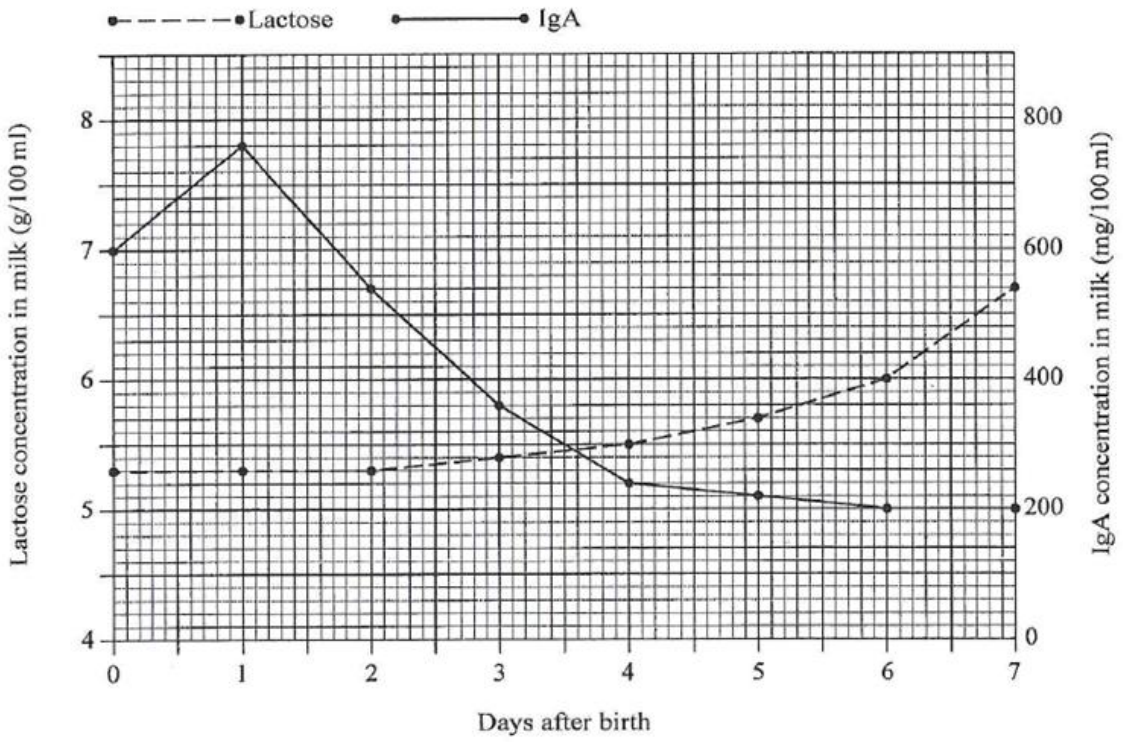
12.

(a) The graphs below show changes in the volume and composition of milk produced by a woman in the first week following the birth of her child.

Graph 1 – changes in the volume of milk produced



Graph 2 – Changes in the concentration of lactose sugar and IgA antibody in milk



(a) From **Graph 2**, describe **two** ways in which the composition of milk produced in the first three days after birth differs from milk produced later.

1._____

2. _____ 1

(b) What was the volume of milk produced on day 3?

_____ 1

(c)(i) Between days 2 and 3 this woman produced a constant mass of IgA.

Explain why the concentration of IgA in her milk decreased during this time.

_____

_____ 1

(ii) Express, as a simple whole number ratio, the concentration of IgA compared to the concentration of lactose produced on day 6.

(1g = 1000mg)

Space for calculation

_____:_____

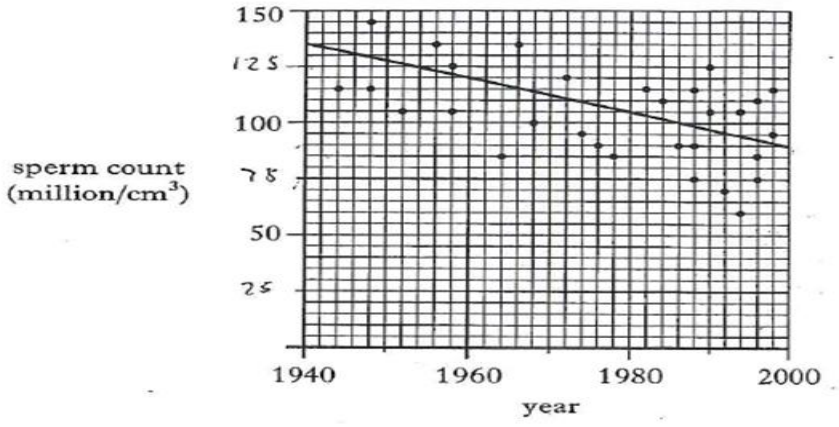
IgA Lactose 1

(d) Using **Graphs 1 and 2,** calculate the mass of lactose produced on day 5.

Space for calculation

_____g 1

13. The sperm counts of 30 men taken between 1940 and 2000 are shown in the graph below. A line of best-fit has been drawn, to indicate the trend over the 60 year period.



(a) Using the line of best-fit, calculate the percentage decline in sperm count over the 60 year period.

Space for calculation

_____ %

(b) From the graph, what is the maximum sperm count for any one individual recorded during this period?

_____million/cm^3 1

(c) Name the pituitary hormone which stimulates the production of sperm.

_____ 1

(d) Name a gland which adds fluid to sperm during ejaculation and describe **one** function of this fluid.

Gland _____ 1

Function of fluid _____

_____ 1

(e) Two treatments sometimes used for infertility are artificial insemination and *in vitro* fertilisation. Describe briefly what is meant by these terms.

Artificial insemination _____

_____

In vitro fertilisation _____

_____ 2

14.(a) Decide if each of the following statements about treatments for infertility is **TRUE or FALSE** and tick (✔) the correct box.

If the answer is FALSE, write the correct word(s) in the correction box to replace the word(s) **underlined** in the statement.

Statement	True	False	Correction
If mature sperm are defective or very low in number IVF can be used			
Ovulation can be stimulated by drugs that prevent the negative feedback effect of progesterone on FSH secretion			
Donor sperm can be used in artificial insemination of the male partner is sterile.			

(b) The table below refers to semen samples take from five men.

Semen Sample	A	B	C	D	E
Number of sperm in sample (millions/cm^3)	60	20	50	40	60
Number of normal sperm in sample (millions/cm^3)	30	14	40	22	50

Letter: _____ 1

(ii) A man is fertile if at least 60% of his sperm are normal
Identify which man/men is/are infertile. 1

Letter(s): _____

15.(a) A variety of techniques can be used to monitor the health of the mother and the developing foetus. State what each of the following is used for:

(i) Ultrasound imaging _____ 1

(i) Dating scans _____ 1

(b) A sample of fluid which surrounds the embryo can be extracted from the mother using a syringe.

(i) What is the name given to this technique?

_____ 1

(ii) Give **ONE** advantage and **ONE** disadvantage in using this technique.

Advantage: _____ 1

Disadvantage: _____ 1

(c) Postnatal screening can be carried out involving diagnostic testing for metabolic disorders.

Name a metabolic disorder which can be tested for using postnatal screening techniques.

Name: _____ 1

16. Discuss the screening and testing procedures which may be carried out as part of antenatal care. 10 marks

17. Discuss procedures that can be used to treat infertility (10)

18. Give an account of antenatal screening. (8)

Fertility and pregnancy