Chapter test

14 Reproduction in humans

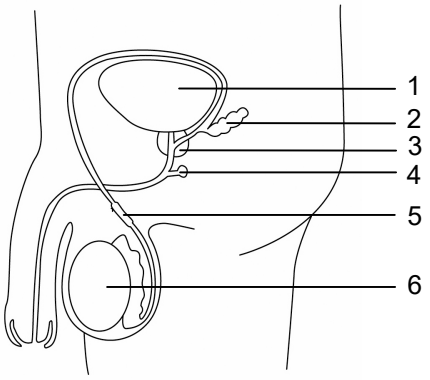
Name: _____ ( ) Class: _____ Date: _____

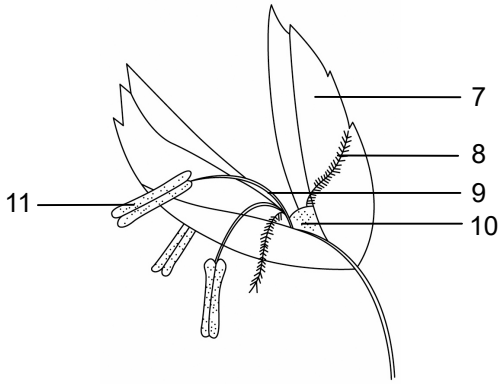
Total marks: 40 marks
Time allowed: 40 minutes
Answer ALL questions.

Score: / 40

A. Concept checking (10 marks, 1 mark each)

***Directions*:** Questions 1 to 3 refer to the diagrams below, which show the human male reproductive system and a flower.





★ 1. Which of the following combinations is correct?

	Structures	*Function*
A.	2 and 10	for storage of gametes
B.	5 and 9	for transport of gametes
C.	6 and 11	for production of gametes
D.	2 and 8	for supplying nutrients to the gametes

☐

2. In which structures does meiosis take place?

A. 4 and 10
B. 6 and 8
C. 2 and 10
D. 6 and 11

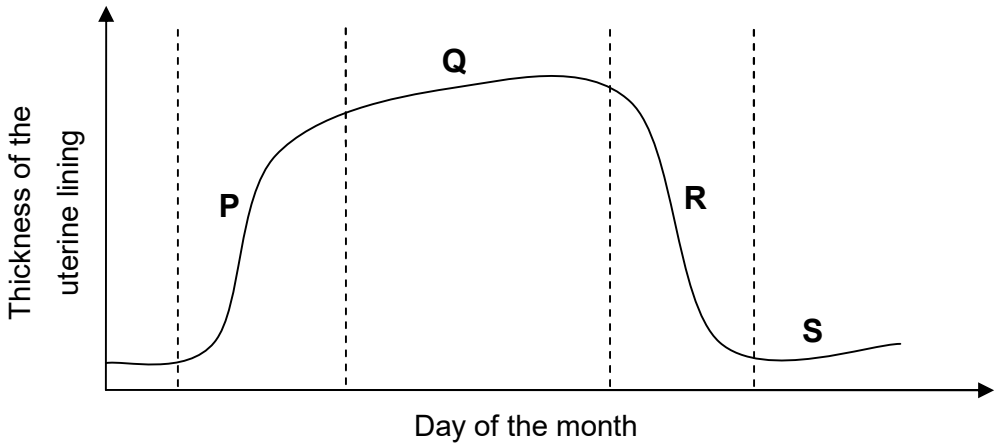
☐

★ 3. What of the following may happen to a man if structure 5 on both sides of the body is tied and cut?

(1) There is no sperm production.
(2) There is no sperm in the semen.
(3) He loses his secondary sexual characteristics.

A. (2) only
B. (1) and (2) only
C. (2) and (3) only
D. (1), (2) and (3) ☐

***Directions*:** Questions 4 and 5 refer to the graph below, which shows the changes in the thickness of the uterine lining of a woman in a month.



★ 4. The woman would most likely to get pregnant if she has sexual intercourse during

A. the early period of P.
B. the early period of Q.
C. the middle period of R.
D. the middle period of S. ☐

★ 5. The change in the thickness of the uterine lining during the early period of P is due to

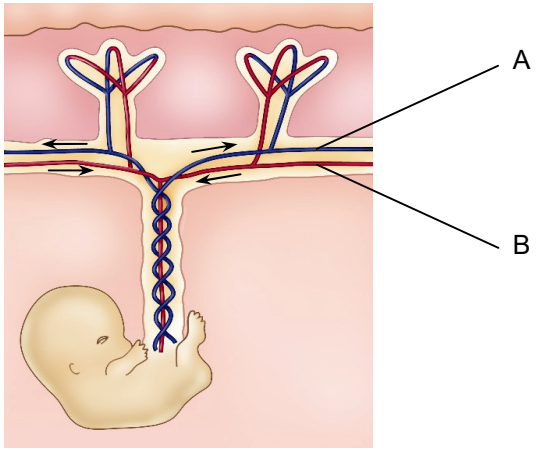
A. the development of follicle.
B. the release of ovum.
C. the formation of yellow body.
D. the degeneration of yellow body. ☐

★ 6. Which of the following happen(s) after a zygote is formed?

(1) The zygote stays in the oviduct until the placenta develops.
(2) The zygote implants into the uterine lining.
(3) The zygote divides by mitotic cell division.

A. (1) only
B. (3) only
C. (1) and (2) only
D. (2) and (3) only

★ 7. The diagram below shows a developing embryo in the uterus.



Which of the following substance(s) has / have a higher concentration in the blood of vessel A than that of vessel B?

(1) amino acids
(2) carbon dioxide
(3) urea

A. (1) only
B. (2) only
C. (1) and (3) only
D. (2) and (3) only

8. Fraternal twins are formed when

A. an ovum fuses with a sperm.
B. an ovum fuses with two sperms at the same time.
C. two ova fuse with a sperm at the same time.
D. two ova fuse with two sperms separately.

9. Which of the following contraceptive methods is the most effective in preventing the spread of sexually transmitted diseases?

   A. using a diaphragm
   B. using a male condom
   C. receiving vasectomy
   D. taking contraceptive pills ☐

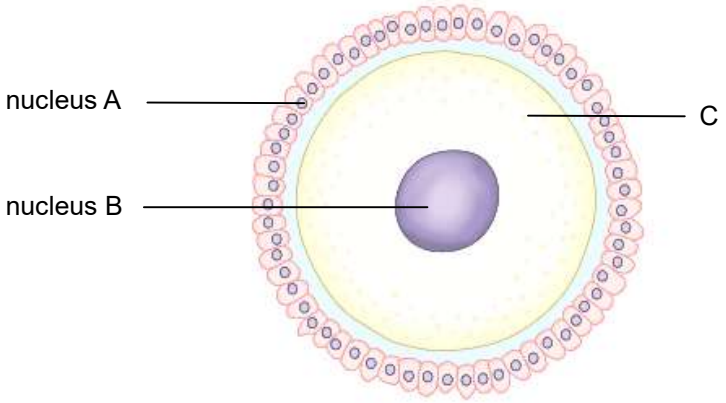
10. Which of the following contraceptive methods is the most ***unreliable***?

   A. taking contraceptive pills
   B. using an intrauterine device
   C. using a condom
   D. using the rhythm method ☐

Question	1	2	3	4	5	6	7	8	9	10
Related section	14.1	14.1	14.8	14.3	14.3	14.4	14.5	14.5	14.8	14.8

B. Problem solving (23 marks)

11. The diagram below shows a human ovum and the surrounding follicle cells.



(a) Which structure in the human body produces ova? (1 mark)

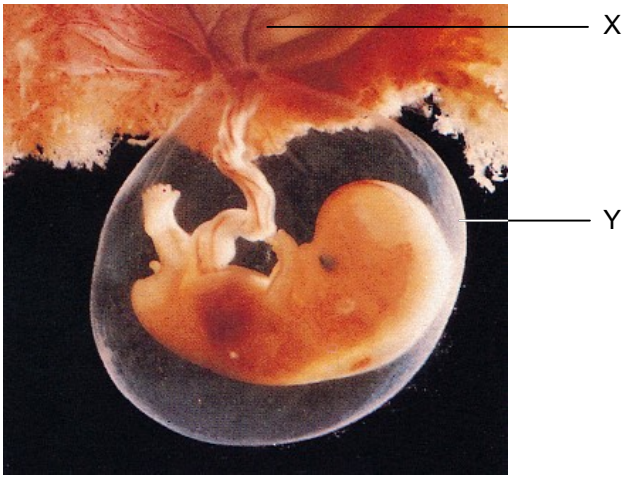
(b) Contrast the genetic make-up of nuclei A and B. (2 marks)

(c) What is the function of structure C in embryo development? (2 marks)

(d) Unlike sperms, ova lack a tail for movement. Describe how an ovum moves along the oviduct. (2 marks)

(Total: 7 marks)

★ 12. The photograph below shows a foetus and its associated structures.



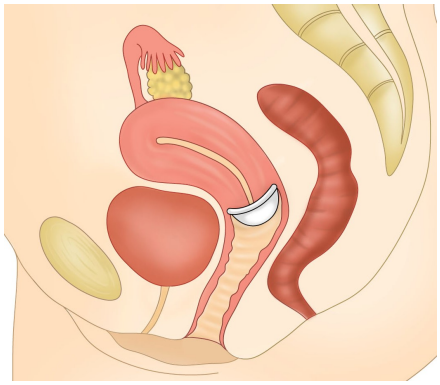
(a) Name the fluid inside structure Y. Give ***two*** functions of the fluid. (3 marks)

(b) The surface of structure X has a large number of villi, which extend into the surface of the uterine lining. Explain the importance of these villi. (2 marks)

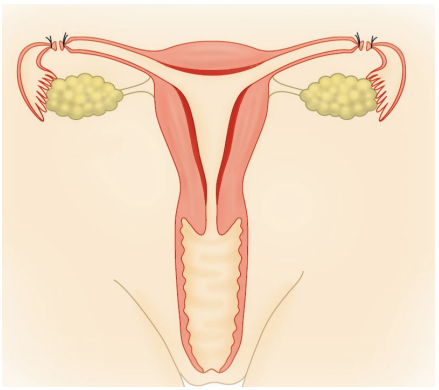
(c) The maternal blood and foetal blood are separate. Suggest ***three*** significances of this feature. (3 marks)

(Total: 8 marks)

★ 13. The diagrams below show two contraceptive methods that can be applied by females.



Method A



Method B

(a) (i) Describe the biological principle of method A. (2 marks)

(ii) Why has the device used in method A to be fitted by a doctor? (1 mark)

(b) (i) Explain why couples adopting method B for contraception must be sure that they do not want babies in the future. (1 mark)

(ii) A woman considers using method B to prevent pregnancy. Will the menstrual cycle be disturbed after adopting method B? Explain your answer. (4 marks)

(Total: 8 marks)

C. Exam challenge (7 marks)

★ 14. Read the article below and answer the following questions.

> A pregnant woman should not smoke. There are many harmful chemicals in the cigarettes which can pass to the foetus from the maternal blood. These harmful chemicals may cause miscarriage, premature birth and impaired intellect of the child. Nicotine in cigarettes can stimulate vasoconstriction in the placenta; while the carbon monoxide produced during smoking can combine with haemoglobin in the mother's red blood cells.

(a) Describe how nicotine and carbon monoxide enter the foetal blood. (2 marks)

(b) Explain how smoking during pregnancy could affect the growth of the foetus. (5 marks)

(Total: 7 marks)

Marking scheme

A. Concept checking (10 marks, 1 mark each)

1.	C	2.	D	3.	A	4.	B	5.	A
6.	B	7.	D	8.	D	9.	B	10.	D

(1 mark each)

B. Problem solving (23 marks)

11. (a) Ovary (1)

(b) Nucleus A contains diploid number of chromosomes. / There are 46 chromosomes in nucleus A. (1)

Nucleus B contains haploid number of chromosomes. / There are 23 chromosomes in nucleus B. (1)

(c) Structure C contains food reserves, (1)

which nourish the developing embryo for a few weeks after fertilization and before the placenta forms. (1)

(d) The beating action of cilia lining the oviduct (1)

and wave-like muscular contractions of the oviduct move the ovum along the tube. (1)

(Total: 7 marks)

12. (a) Amniotic fluid (1)

Any ***two*** of the following: (2)

- It acts as a shock absorber, protecting the foetus from mechanical shock. (1)
- It prevents the foetus from drying out / desiccation. (1)
- It allows the foetus some freedom of movement. (1)
- It provides a stable environment for the foetus. (1)
- It helps lubricate the birth canal during childbirth. (1)

(b) The villi provide a large surface area for the exchange of materials. (1)

The villi allow close contact between the foetal blood and maternal blood, which reduces the distance for diffusion of materials. (1)

(c) This prevents the clumping of the foetal blood and maternal blood when their blood groups are incompatible. (1)

It prevents the high blood pressure of the maternal blood from damaging the foetal blood vessels. (1)

It prevents large pathogens and toxins in the maternal blood from entering the foetal blood. (1)

(Total: 8 marks)

13. (a) (i) The diaphragm acts as a physical barrier to prevent sperms from meeting an ovum. (1)

It fits over the cervix so that the sperms cannot enter the uterus. (1)

(ii) The size of the cervix may vary in different women. A diaphragm of appropriate size is selected by a doctor for a woman so that the diaphragm can cover the cervix tightly. (1)

(b) (i) Method B is often irreversible. (1)

(ii) The menstrual cycle will not be disturbed. (1)

The cut of oviducts will not affect the production of the female sex hormones by the ovaries. (1)

The female sex hormones are transported by blood to the target organs to carry out their functions. (1)

The uterine lining will be thickened and shed off under the influence of the female sex hormones. (1)

(Total: 8 marks)

C. Exam challenge (7 marks)

14. (a) In the lungs of a pregnant woman, nicotine and carbon monoxide diffuse across the air sacs and dissolve in her blood. (1)

These substances then pass to the foetal blood through the placenta by diffusion. (1)

(b) Nicotine can stimulate vasoconstriction in the placenta. The supply of nutrients and oxygen to the foetus is reduced. (1)

Carbon monoxide combines with haemoglobin in the mother's red blood cells. The oxygen carrying capacity of haemoglobin is reduced. / Less oxygen can be carried by the mother's blood. (1)

This reduces the oxygen supply to the foetus. (1)

The foetus cannot obtain enough nutrients and oxygen for respiration. (1)

With less energy available, its growth will be hindered. (1)

(Total: 7 marks)