

1 Fig. 5.1 shows the human male reproductive system and part of the urinary system.

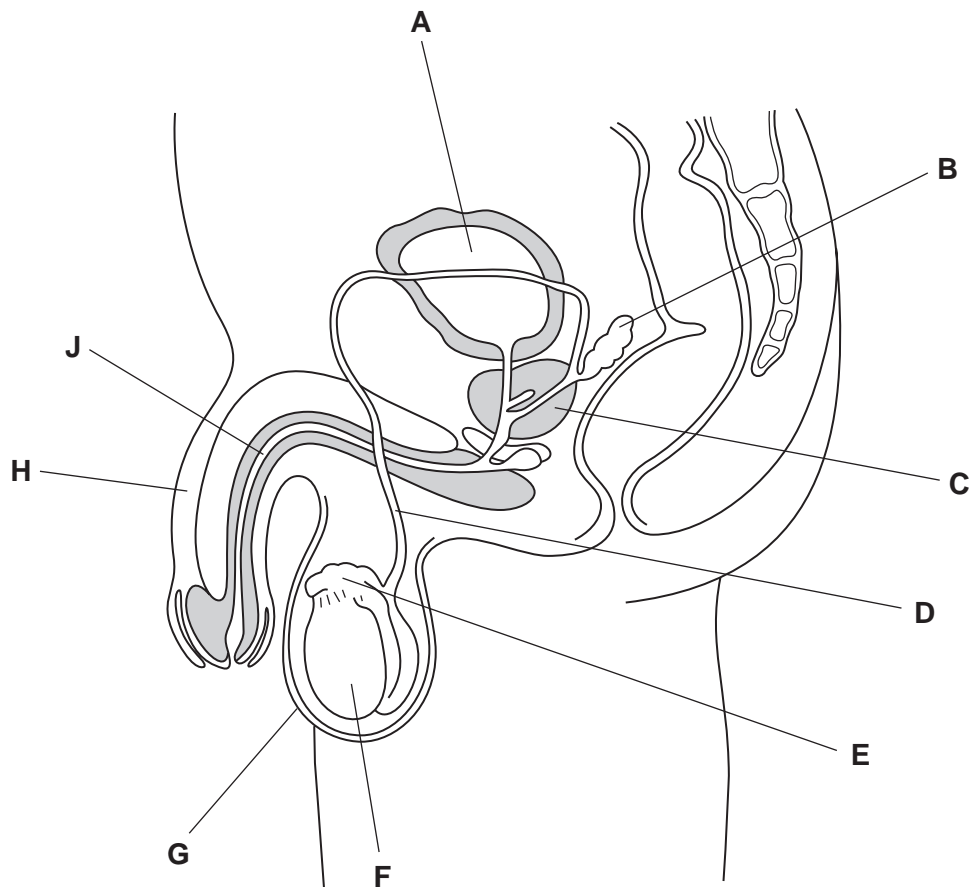


Fig. 5.1

(a) Complete Table 5.1 by identifying the structure in the male reproductive system shown in Fig. 5.1 that carries out each of the functions listed.

Write one letter only in each box. You may use the same letter more than once. There are some letters that you will not use. The first one has been done for you.

Table 5.1

function	s
stores urine	A
produces gametes	
produces seminal fluid	
moves gametes by peristalsis	
produces testosterone	

[4]

(b) Describe how human male gametes differ from human female gametes.

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..... [4]

(c) Some women have difficulty becoming pregnant. They can be helped by taking fertility drugs. They can also be helped by artificial insemination.

(i) Describe how fertility drugs help women to become pregnant.

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.....
.....
..... [3]

(ii) Describe how artificial insemination is carried out.

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.....
..... [2]

[Total: 13]

- 2 The egg cell is the female gamete. Fig. 5.1 shows an ovum at the time of ovulation. The ovum is surrounded by a 'jelly coat' and many follicle cells.

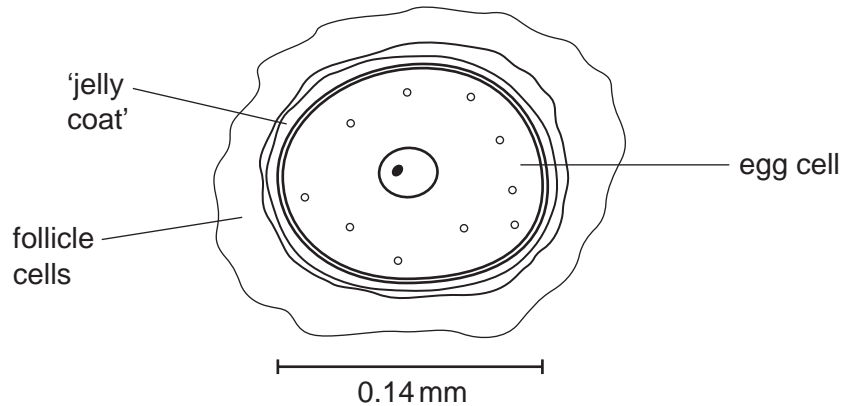


Fig. 5.1

- (a) Calculate the magnification of the egg cell as shown in Fig. 5.1.

Show your working and express your answer to the nearest whole number.

answer = [2]

- (b) State three ways in which the **structure** of an egg cell, as shown in Fig. 5.1, differs from the **structure** of a sperm cell.

- 1
- 2
- 3 [3]

- (c) Meiosis is involved in the production of male and female gametes.

Explain why it is important that meiosis occurs during the production of gametes.

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..... [2]

Some women are unable to become pregnant because they or their partner are infertile.

(d) Suggest one reason why a man may be infertile and one reason why a woman may be infertile.

man

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woman

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..... [2]

One way to treat infertility in a woman is to use artificial insemination (AI) using her partner's sperm.

The stages involved in AI are as follows.

1. If the doctor decides that AI is suitable, the woman will be given a course of a fertility drug at an appropriate stage of her menstrual cycle.
2. After two weeks, ultrasound is used to find out when the woman is likely to ovulate.
3. Sperm are collected from the man.
4. The sperm are placed into the uterus of the woman near the time of ovulation.
5. The woman is given an injection of a hormone to encourage the corpus luteum in the ovary to secrete progesterone.

(e) Explain why the sperm must be placed in the uterus near the time of ovulation.

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..... [3]

(f) Explain why it is important that progesterone is secreted after ovulation.

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..... [3]

(g) The success rate of AI is about 16%.

Suggest how the success rate of AI is calculated.

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..... [2]

[Total: 17]

3 The fungus, *Trichophyton violaceum*, reproduces asexually by releasing spores.

A single spore was placed in the centre of a Petri dish containing an agar medium with starch and protein.

Fig. 1.1 shows the fungus that grew from the spore.

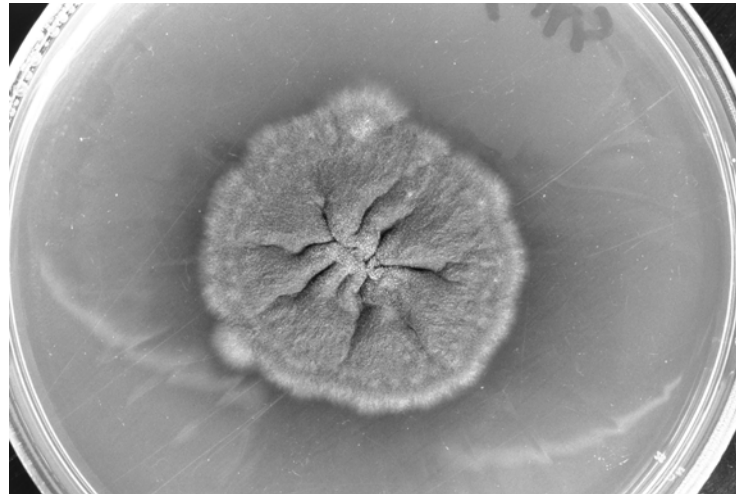


Fig. 1.1

(a) State the name given to

(i) the body of the fungus that grows from a single spore

..... [1]

(ii) the thin threads that make up the body of the fungus.

..... [1]

(b) Describe how a fungus, such as *T. violaceum*, obtains nutrients from the agar medium.

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..... [4]

Streptomyces, a soil bacterium, is a major source of antibiotics that are produced by pharmaceutical companies. An antibiotic sensitivity test can be carried out to help doctors decide which antibiotic should be used to treat a specific disease, such as gonorrhoea.

Gonorrhoea bacteria isolated from a person are grown on an agar medium. A ring with eight different antibiotics (1 to 8) is placed on the agar medium and left for 24 hours at 35°C.

Fig. 1.2 shows the growth of bacteria on the agar medium after 24 hours.

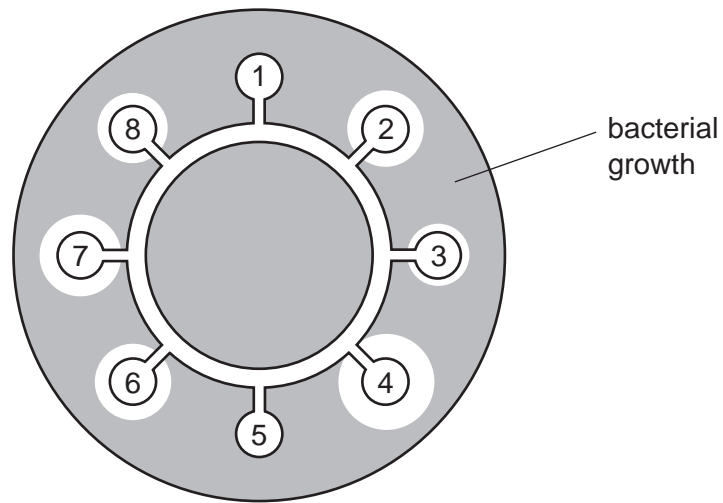


Fig. 1.2

(c) (i) Suggest why there is a clear area around some of the antibiotics.

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.....
..... [2]

(ii) Explain why antibiotics 1 and 5 would **not** be chosen to treat the gonorrhoea infection.

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..... [2]

- (iii) People who take antibiotics should always be told to complete the treatment rather than stop taking the antibiotics when they feel better.

Suggest why people are given this advice.

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..... [2]

[Total: 12]

4 Fig. 3.1 shows a fetus in the uterus immediately before birth.

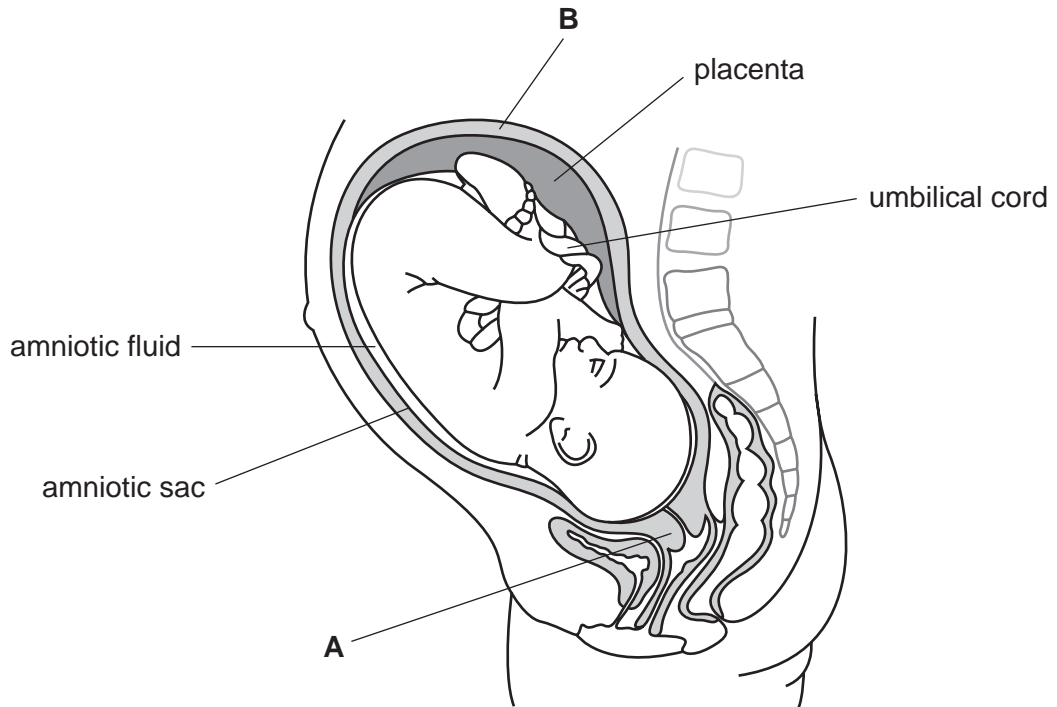


Fig. 3.1

(a) Describe the functions of the amniotic sac and amniotic fluid.

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[4]

(b) List three functions of the placenta.

1.
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 2.
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 3.
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- [3]

(c) State what happens to structures **A** and **B** during birth.

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..... [2]

(d) Discuss the advantages **and** possible disadvantages of breast-feeding.

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..... [4]

[Total: 13]