

29 Which chromosomes can be found in a single sperm?

- A** X and X **B** X and Y **C** X or X **D** X or Y

30 Why are lymphocytes the only cells that produce antibody proteins?

- A** Lymphocytes express all the genes in the nucleus.
B Lymphocytes have twice as many genes as other cells.
C Other cells do **not** have the genes for antibodies.
D The genes for antibodies are only expressed in lymphocytes.

4 Fig. 4.1 is a photograph of a bee on a flower. One of the bee's legs is covered with pollen.



Fig. 4.1

(a) (i) State **three** features of flowers that attract pollinating insects such as bees.

- 1
2
3 [3]

(ii) State **one** way that pollen grains are adapted for pollination by bees.

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..... [1]

(b) Describe **two** ways the structure of a monocotyledonous plant differs from the structure of a dicotyledonous plant.

- 1
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2
..... [2]

(c) Fig. 4.2 is a diagram of a cross-section of an insect-pollinated flower.

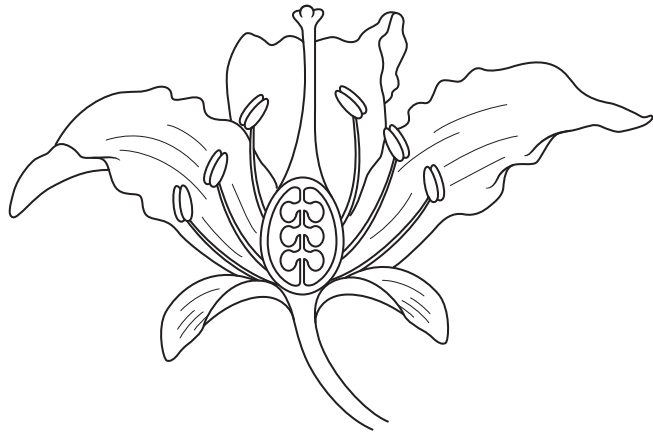


Fig. 4.2

On Fig. 4.2, name and draw label lines to:

- the structure that supports an anther
- a structure that protects the flower bud
- an ovule.

[3]

(d) Describe sexual reproduction in a flower, from the release of pollen to the formation of a zygote.

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(e) Sexual reproduction also occurs in humans.

(i) State the name of the male gamete in a human.

..... [1]

(ii) State where gametes are formed in the human male reproductive system.

..... [1]

(iii) Human male gametes are haploid.

State the name of the process that produces haploid male gametes.

..... [1]

(iv) Describe the function of the prostate gland in the male reproductive system.

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..... [1]

[Total: 18]

6 Fig. 6.1 is a diagram of a cell that shows how DNA is involved in protein synthesis.

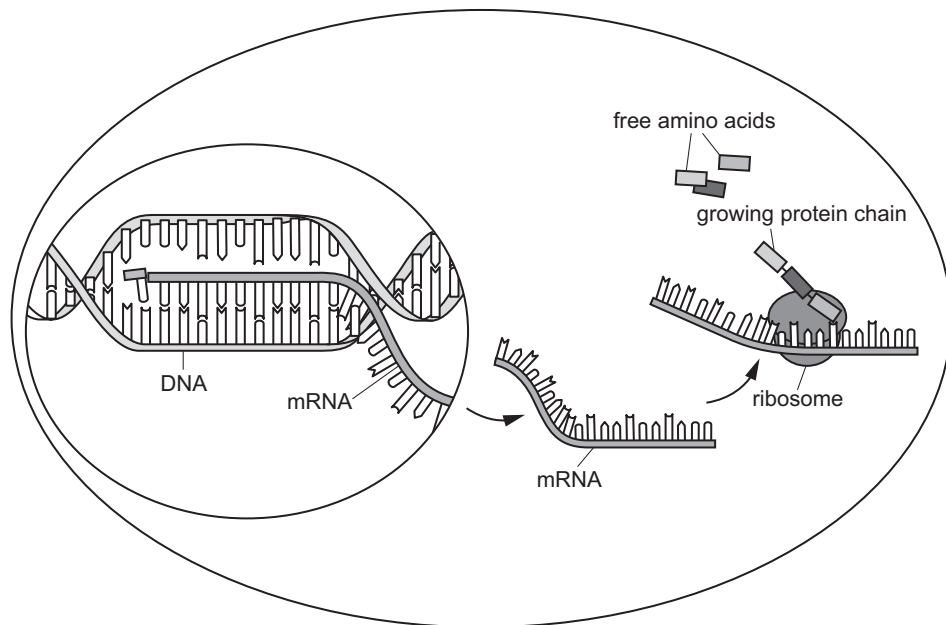


Fig. 6.1

(a) State the name of the part of the cell that contains DNA.

..... [1]

(b) DNA controls cell function by controlling the production of proteins.

State the name of **one** type of protein.

..... [1]

(c) Using Fig. 6.1, explain how mRNA is involved in protein synthesis.

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 [3]

31 Phagocytes and neurones are two types of specialised cell.

Which statements are correct?

- 1 Phagocytes and neurones express the same genes.
- 2 Both types of cell have the same genes.
- 3 Both types of cell only express the genes that make the proteins needed for the cell to function.

A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 2 only

30 Which name is given to different versions of a gene?

- A** allele
- B** chromosome
- C** length of DNA
- D** protein

- 3 (a) Fig. 3.1 shows one stage involved in plant reproduction after pollination.

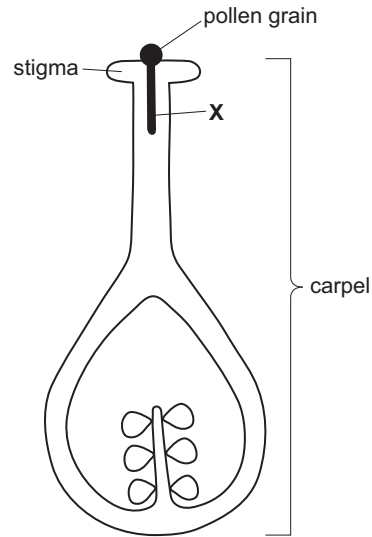


Fig. 3.1

- (i) State the name of the part labelled X in Fig. 3.1.

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- (ii) Describe the events that occur after the stage shown in Fig. 3.1 that result in fertilisation.

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..... [3]

- (b) A species of plant can use self-pollination and cross-pollination.

- (i) Suggest reasons for this species of plant to use self-pollination rather than cross-pollination.

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..... [3]

- (ii) Discuss the potential effects of only using self-pollination in a population of plants.

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..... [3]

- (c) Meiosis produces gametes and is a source of genetic variation.

State **two other** sources of genetic variation in populations.

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2 [2]

(d) Describe mitosis and its roles in organisms.

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..... [4]

(e) State the name of the unspecialised cells that divide by mitosis.

..... [1]

[Total: 17]

30 Which statement about the sex chromosomes is correct?

- A Men and women can inherit characteristics controlled by genes on the X chromosome.
- B Men and women can inherit characteristics controlled by genes on the Y chromosome.
- C Only men can inherit characteristics controlled by genes on the X chromosome.
- D Only women can inherit characteristics controlled by genes on the Y chromosome.