

Reproduction practice questions

31 questions • 95 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 95

Asexual and sexual reproduction Spec 16.1, 16.2

- 1** Which statement describes asexual reproduction? [1 mark]
- A. ☐ Two parents produce offspring that are genetically different from each other
- B. ☐ One parent produces offspring that are genetically identical to it
- C. ☐ Two gametes fuse to form a zygote
- D. ☐ One parent produces gametes that fuse with each other
- 2** The table gives information about the reproduction of four organisms. (a) Identify the two organisms that reproduce asexually. [2] (b) Give one reason for your answer. [1] [3 marks]

Reproduction in four organisms	
Organism	How it reproduces
P	A bacterial cell divides into two cells. The two cells are the same as the parent cell.
Q	A male and a female frog release gametes into the water. The gametes fuse.
R	A strawberry plant grows a runner and a new plantlet forms at the end of the runner.
S	Pollen from one tomato plant lands on the stigma of another tomato plant.

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3

Supplement

[4 marks]

A farmer grows a crop of potato plants. Each new potato plant is grown from a tuber of a parent plant. (a) Describe two advantages to the farmer of growing the crop by asexual reproduction. [2] (b) Describe two disadvantages of growing the crop by asexual reproduction. [2]

4

Which statement defines fertilisation?

[1 mark]

- A. ☐ The transfer of pollen grains from an anther to a stigma
- B. ☐ The production of offspring from one parent
- C. ☐ The fusion of the nuclei of gametes
- D. ☐ The division of a cell into two identical cells

5

Supplement

[4 marks]

The nucleus of a body cell of an animal contains 14 chromosomes. (a) State the number of chromosomes in the nucleus of a gamete of this animal. [1] (b) State the word used to describe the nucleus of a gamete. [1] (c) Two gametes fuse to form a zygote. State the number of chromosomes in the nucleus of the zygote and the word used to describe this nucleus. [2]

6

Supplement

[4 marks]

Discuss the advantages and disadvantages of sexual reproduction to a population of a species in the wild.

Sexual reproduction in plants

Spec 16.3

7 Which statement describes pollination?

- A. ☐ The fusion of a pollen nucleus with a nucleus in an ovule
- B. ☐ The transfer of pollen grains from an anther to a stigma
- C. ☐ The growth of a seed into a new plant
- D. ☐ The production of pollen in an ovary

8 Name the part of an insect-pollinated flower that: (a) produces pollen grains [1] (b) receives pollen grains [1] (c) contains the ovules [1] (d) protects the flower when it is in the bud. [1] **[4 marks]**

[illegible]

9 The table gives information about two pollen grains, X and Y. One is from an insect-pollinated flower and one is from a wind-pollinated flower. (a) Which pollen grain, X or Y, is from the wind-pollinated flower? [1] (b) Give one reason for your answer. [1] (c) Suggest why wind-pollinated flowers make much more pollen than insect-pollinated flowers. [1] **[3 marks]**

Two pollen grains		
Pollen grain	Diameter / μm	Surface
X	35	Smooth
Y	90	Covered in spikes

[illegible]

10 A grass flower is pollinated by wind. Describe and explain how the anthers and the stigmas of the flower are adapted for wind pollination. **[4 marks]**

11 **Supplement** **[4 marks]**
Describe what happens from the time a pollen grain lands on a stigma until fertilisation takes place.

12 **Supplement** **[5 marks]**
(a) Describe the difference between self-pollination and cross-pollination. [2] (b) Discuss the possible effects of cross-pollination, compared with self-pollination, on a population of plants. [3]

- 13** A student investigated the conditions needed for seeds to germinate. She set up four tubes, each containing 20 mustard seeds, and left them in the dark for five days. (a) State which tube is the control. [1] (b) Explain what the results show about the conditions needed for germination. [3] (c) Explain why the water in tube C was boiled and cooled before it was used. [1] **[5 marks]**

Germination investigation		
Tube	Conditions	number of seeds germinated
A	Damp cotton wool, air, 20 °C, dark	19
B	Dry cotton wool, air, 20 °C, dark	0
C	Seeds covered with boiled, cooled water and a layer of oil, 20 °C, dark	0
D	Damp cotton wool, air, 4 °C, dark (fridge)	0

Sexual reproduction in humans Spec 16.4

- 14** What is the function of the amniotic fluid? **[1 mark]**
- A. ☐ To supply oxygen to the fetus
- B. ☐ To protect the fetus from knocks and bumps
- C. ☐ To carry urea away from the fetus
- D. ☐ To join the fetus to the uterus wall
- 15** State the function of each of the following parts of the male reproductive system. (a) testis **[4 marks]**
 [1] (b) scrotum [1] (c) prostate gland [1] (d) urethra [1]

16 The female reproductive system includes the ovaries, oviducts, uterus, cervix and vagina. **[3 marks]**

(a) Name the part where fertilisation usually happens. [1] (b) State the function of the cervix. [1] (c) State the function of the ovaries. [1]

17 Explain how each of these features adapts a sperm to its function. (a) a flagellum [1] (b) **[3 marks]**

many mitochondria [1] (c) enzymes in the acrosome [1]

18 (a) Explain why an egg cell has energy stores. [1] (b) Describe what happens to the jelly **[3 marks]**

coat of an egg cell at fertilisation and explain why this is important. [2]

19 Compare sperm and egg cells in terms of size, motility and numbers produced. [4] **[4 marks]**

20**Supplement****[5 marks]**

The placenta and umbilical cord link a fetus to its mother. (a) State two substances that pass from the mother's blood to the fetus's blood. [2] (b) State two substances that pass from the fetus's blood to the mother's blood. [2] (c) Name one type of harmful agent, other than those in (a) and (b), that can cross the placenta and affect the fetus. [1]

Sex hormones in humans

Spec 16.5

21

Which row shows where a sex hormone is made and one effect of it at puberty?

[1 mark]

- A. ☐ Testosterone; ovaries; breasts develop
- B. ☐ Testosterone; testes; voice deepens
- C. ☐ Oestrogen; testes; hips widen
- D. ☐ Oestrogen; ovaries; facial hair grows

22

(a) Name the hormone that causes secondary sexual characteristics to develop in boys. [1] **[4 marks]**
(b) State two secondary sexual characteristics that develop in boys at puberty. [2] (c) State one secondary sexual characteristic that develops in girls at puberty. [1]

- 23** The menstrual cycle lasts about 28 days. (a) Describe what happens to the lining of the uterus during days 1 to 5. [1] (b) Describe the change in the lining of the uterus between day 5 and day 14. [1] (c) Describe the change that happens in an ovary at about day 14. [1] (d) Describe what happens to the lining of the uterus from day 14 to day 28 if the woman does not become pregnant. [1] **[4 marks]**

- 24** **Supplement** **[1 mark]**

Which hormone causes ovulation?

- A. ☐ FSH
 B. ☐ LH
 C. ☐ Oestrogen
 D. ☐ Progesterone

- 25** **Supplement** **[4 marks]**

The table shows the relative level of two hormones in a woman's blood during one menstrual cycle. (a) Hormone Y is progesterone. Name the organ that makes it between day 14 and day 28. [1] (b) Hormone X is also made in the ovaries. Name hormone X and state its effect on the lining of the uterus between day 7 and day 14. [2] (c) Suggest why the level of hormone Y falls between day 21 and day 28. [1]

Hormone levels during the menstrual cycle (arbitrary units)		
day	hormone X	hormone Y
1	1	1
7	3	1
14	9	1
21	5	8
28	1	1

26

Supplement

[4 marks]

(a) State two hormones that are made by the placenta during pregnancy. [2] (b) Explain how a high level of progesterone helps to maintain a pregnancy. [2]

[illegible]

Sexually transmitted infections Spec 16.6

Spec 16.6

27 Which statement about HIV is correct? [1 mark]

- A. ☐ HIV is the same as AIDS
- B. ☐ HIV is a pathogen that causes an STI and may lead to AIDS
- C. ☐ HIV can only be passed on by sexual contact
- D. ☐ HIV is cured by taking a vaccine

28 (a) Describe a sexually transmitted infection (STI). [1] (b) State what HIV infection may lead to. [1] **[2 marks]**

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29 Describe three ways in which HIV can be transmitted. [3] **[3 marks]**

30 Explain how the spread of STIs can be controlled. [4] **[4 marks]**

[illegible]

31 Which activity does not transmit HIV?

[1 mark]

- A. ☐ Sharing needles
- B. ☐ Unprotected sexual contact
- C. ☐ Shaking hands
- D. ☐ Breast milk from an infected mother

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [3]

- (a) P (1)
- R (1)
- (b) only one parent involved / no gametes fuse / offspring genetically identical (1)

3. [4] **Supplement**

- (a) all plants have the same desirable features / uniform crop / known yield and quality (1)
- quick / cheap / no pollination needed / many plants produced (1) allow only one parent needed
- (b) no genetic variation, so all the plants are susceptible to the same disease or pest (1) allow whole crop could be lost
- no variation so cannot produce new varieties / cannot adapt to changed conditions (1) ignore 'less yield'
- Max 2 for (a) and max 2 for (b)

4. [1]

C C (1)

5. [4] **Supplement**

- (a) 7 (1)
- (b) haploid (1)
- (c) 14 (1)
- diploid (1)

6. [4] **Supplement**

- advantage: offspring show genetic variation / are genetically different (1)
- if the environment changes / new disease appears, some individuals may survive (1) allow better able to adapt / natural selection
- disadvantage: two parents are needed / must find a mate (1)
- takes more time and energy / fewer offspring / population grows more slowly (1)
- Max 4

7. [1]

B B (1)

8. [4]

- (a) anther (1) allow stamen
- (b) stigma (1)
- (c) ovary (1) allow carpel
- (d) sepal(s) (1)

9. [3]

- (a) X (1)
- (b) smaller / lighter / smooth surface (1) allow carried easily by the wind
- (c) pollen is carried randomly by the wind / most pollen does not land on a stigma (of the same species) (1) ignore 'to make sure pollination happens' unqualified

10. [4]

- anthers hang outside the flower / on long filaments (1)
- so the wind can blow the pollen away (1)
- stigmas are large / feathery / hang outside the flower (1)
- to catch pollen grains from the air / give a large surface area (1)

11. [4] Supplement

- pollen tube grows from the pollen grain (1)
- down through the style (1)
- towards the ovary and enters the ovule (1) allow through the micropyle
- pollen nucleus fuses with the nucleus of the egg cell / nucleus in the ovule (1) allow male gamete fuses with female gamete
- Max 4

12. [5] Supplement

- (a) self-pollination: pollen moves to a stigma of the same flower or another flower on the same plant (1)
- cross-pollination: pollen moves to a stigma of a flower on a different plant of the same species (1)
- (b) cross-pollination gives more variation (in the offspring) (1)
- so the population is better able to respond to / survive a change in the environment (1) allow some will survive a new disease
- but it relies on pollinators / insects or wind, so fewer seeds may be made if pollinators are scarce (1) allow self-pollination is less reliant on pollinators

13. [5]

- (a) A (1)
- (b) water is needed: B has no water and none germinated (1)
- oxygen is needed: boiling removes dissolved oxygen / the oil stops air entering in C and none germinated (1)
- a suitable (warm) temperature is needed: D is too cold and none germinated (1) allow low temperature stops germination
- (c) to remove dissolved oxygen (1) ignore cooled so the seeds are not killed / to keep the temperature the same

14. [1]

B B (protects the fetus from knocks and bumps) (1)

15. [4]

- (a) makes sperm (1) allow produces sperm and testosterone
- (b) holds the testes outside the body / keeps the testes cooler than body temperature (1)
- (c) adds fluid to sperm to make semen / produces seminal fluid (1)
- (d) carries semen (sperm) (and urine) out of the body through the penis (1)

16. [3]

- (a) oviduct (1) allow fallopian tube
- (b) ring of muscle that keeps the fetus in the uterus during pregnancy / closes the opening of the uterus (1)
- (c) make and release egg cells (1) allow produce oestrogen and progesterone

17. [3]

- (a) moves / propels the sperm towards the egg cell (1) allow swim
- (b) release energy by respiration (1) allow for swimming / for the flagellum to move; accept energy for movement
- (c) digest the jelly coat / egg membrane so the sperm nucleus can enter the egg cell (1)

18. [3]

- (a) to supply energy for the zygote / early embryo to grow until it implants (1)
- (b) the jelly coat changes after one sperm has entered (1)
- so other sperm cannot enter / only one sperm nucleus fuses with the egg nucleus (1)

19. [4]

- sperm are smaller than egg cells / egg cells are larger (1)
- sperm can swim / have a flagellum (1)
- egg cells cannot move by themselves / are moved by cilia or muscle in the oviduct (1)
- millions of sperm are made but usually only one egg cell is released each month (1) allow sperm are made in much larger numbers
- Max 4

20. [5] Supplement

- (a) oxygen (1)
- (a) glucose / amino acids / dissolved nutrients (1) allow vitamins, minerals
- (b) carbon dioxide (1)
- (b) urea / excretory products (1)
- (c) toxins (for example alcohol or a drug) or pathogens (for example a virus) (1) allow nicotine

21. [1]

B B (testosterone is made in the testes and deepens the voice) (1)

22. [4]

- (a) testosterone (1)
- (b) one from: facial hair; pubic hair; underarm hair; voice deepens; muscles develop; penis and testes grow (1)
- (b) a second different one from the same list (1)
- (c) any one from: breasts develop; pubic hair; underarm hair; hips widen; menstrual cycle starts (1)

23. [4]

- (a) breaks down and is lost through the vagina (with blood) (1)
- (b) repaired and becomes thicker (1)
- (c) an egg cell is released (ovulation) (1)
- (d) it stays thick, then breaks down at the end of the cycle (1) allow it is maintained, then lost

24. [1] Supplement

B B (LH) (1)

25. [4] Supplement

- (a) ovary (1) allow corpus luteum
- (b) oestrogen (1)
- (b) repairs / thickens the uterus lining (1)
- (c) the woman is not pregnant / no fertilisation or implantation, so the ovary (corpus luteum) stops making progesterone (1) ignore 'the uterus lining breaks down' (an effect, not a cause)

26. [4] Supplement

- (a) progesterone (1)
- (a) oestrogen (1)
- (b) maintains the (thickness of the) uterus lining (1)
- (b) inhibits FSH and LH so no more egg cells are matured or released (1)

27. [1]

B B (1)

28. [2]

- (a) an infection that is transmitted through sexual contact (1)
- (b) AIDS (1) allow acquired immune deficiency syndrome

29. [3]

- sexual contact (with an infected person) (1)
- sharing needles / contact with infected blood (1) allow blood transfusion
- from an infected mother to her baby (across the placenta, at birth or in breast milk) (1)

30. [4]

- use of condoms (1) as a barrier to prevent body fluids passing between partners (1)
- do not share needles (1) so infected blood is not passed on (1)
- screening donated blood (1) so infected blood is not given to patients (1)
- testing and treating infected people / informing partners (1) allow antiretroviral drugs to reduce the amount of virus
- Max 4

31. [1]

C C (shaking hands) (1)