Reproduction: How Life Continues

Standard difficulty · 20 questions · 40 marks · Time: 37 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. Asexual reproduction in bacteria is by:

(a) binary fission **(b)** budding
(c) vegetative propagation (rhizomes) **(d)** vegetative propagation (leaf buds)

2. Which part of a flower holds the anther up?

(a) The pollen tube **(b)** The sepal
(c) The filament **(d)** The ovule

3. Reproduction that needs only one parent is called:

(a) pollination **(b)** sexual reproduction
(c) fertilisation **(d)** asexual reproduction

4. A body cell of a frog has 26 chromosomes. How many chromosomes are there in an egg cell?

(a) 52 **(b)** 26 **(c)** 13 **(d)** 15

5. A bacterium splits by binary fission every 30 minutes. Starting with 11 cells, how many cells are there after 150 minutes?

(a) 352 **(b)** 21 **(c)** 110 **(d)** 704

6. The embryo develops in:

(a) the oviduct (fallopian tube) **(b)** the vas deferens
(c) the uterus **(d)** the testes

7. 45 of 60 seeds germinated. The germination rate is:

(a) 75% **(b)** 80% **(c)** 25% **(d)** 45%

8. Assertion (A): Offspring of Amoeba are almost identical to the parent.
Reason (R): Amoeba makes gametes that fuse.

(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Section B — Short answer — 8 × 2 = 16 marks

9. Name the method of asexual reproduction in Bryophyllum, and describe it in one line.

10. Give two differences between regeneration and fragmentation.

11. Why is reproduction essential for a species, though not for an individual?

12. A brinjal has 83 seeds. How many ovules were fertilised, and at least how many pollen grains must have grown pollen tubes?

13. A body cell of rice has 24 chromosomes. How many are there in its gametes, and in the zygote?

14. Name the part of a flower that (a) holds the anther up, and the part that (b) carries the male gamete down to the ovule.

15. One Plasmodium cell splits into 9 daughter cells by multiple fission. If each of them does the same once more, how many cells are there?

16. A bacterium divides by binary fission every 45 minutes. Starting with 7 cells, after how many minutes will there be 3,584 cells?

Section C — Word problems — 4 × 4 = 16 marks

17. Describe the steps from pollination to the formation of a seed and a fruit.

18. A gardener wants 175 mango plants exactly like one good parent plant. Which method should be used, and which part of the plant? Give two advantages. If 20% of the pieces planted fail to grow, at least how many pieces must be planted?

19. Two trays each have 50 seeds. Tray A is watered and kept warm; tray B is kept under water with no air. After a week 38 seeds in A and 6 in B have germinated. Find the germination rate of each tray and say what the experiment shows.

20. Explain: (a) The embryo in the uterus can grow for nine months. (b) Some flowers are brightly coloured and scented.

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Answer key

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Q	Answer	Working
1	**(a) binary fission**	—
2	**(c) The filament**	—
3	**(d) asexual reproduction**	—
4	**(c) 13**	gametes have half: 26 ÷ 2
5	**(a) 352**	5 divisions: 11 × 2^5
6	**(c) the uterus**	—
7	**(a) 75%**	45 ÷ 60 × 100
8	**(c) A is true, but R is false.**	A is true: yes: Amoeba reproduces by binary fission. R is false.
9	**Vegetative propagation (leaf buds)**	—
10	**In regeneration a body part or a piece grows into a whole organism using specialised cells (Planaria); in fragmentation a simple body just breaks up and each piece grows (Spirogyra).**	—
11	**An individual can live without reproducing, but a species would die out without new members to replace those that die.**	—
12	**83; 83**	each seed comes from one fertilised ovule, and each ovule is reached by its own pollen tube
13	**12; 24**	gamete: 24 ÷ 2; zygote: 12 + 12
14	**(a) the filament, (b) the pollen tube**	—
15	**81**	9 × 9
16	**405 minutes**	3,584 ÷ 7 = 512 = 2 multiplied 9 times, so 9 divisions × 45 minutes
17	**Pollen lands on the stigma (pollination) and grows a pollen tube down the style into the ovary. The tube carries the male gamete to an ovule, where it fuses with the female gamete (fertilisation) to form a zygote. The zygote becomes the embryo, the ovule becomes the seed and the ovary becomes the fruit.**	—
18	**Vegetative propagation, using grafting. The new plants are identical to the parent and grow and fruit sooner than**	80% of the pieces must give 175: 175 ÷ 0.8 = 218.75, round up

Q	Answer	Working
	plants raised from seed. At least 219 pieces.	
19	**A: 76%, B: 12%. Seeds need air (oxygen) to germinate.**	38 ÷ 50 × 100; 6 ÷ 50 × 100
20	**(a) The placenta passes food and oxygen from the mother’s blood to the embryo. (It is joined to the mother by the placenta.) (b) Insects carry pollen from flower to flower (cross-pollination). (Colour and scent attract insects.)**	—