

## REVISION TEST- HEREDITY

### CH-8 MCQs

1. The colour of a mouse's fur is controlled by a single pair of alleles. A mouse with black fur was crossed with a mouse with white fur. All the offspring had black fur.

What would be the most likely ratio in several litters of offspring if two of these black offspring were crossed?

|          | black fur | white fur |
|----------|-----------|-----------|
| <b>A</b> | 1         | 3         |
| <b>B</b> | 2         | 2         |
| <b>C</b> | 3         | 1         |
| <b>D</b> | 4         | 0         |

2. What is always found in female gametes and may be found in male gametes?

- A. one X chromosome**
- B. one Y chromosome**
- C. two X chromosomes**
- D. one X chromosome and one Y chromosome**

3. Which type of reproduction and which type of cell division produces nuclei with half the number of chromosomes?

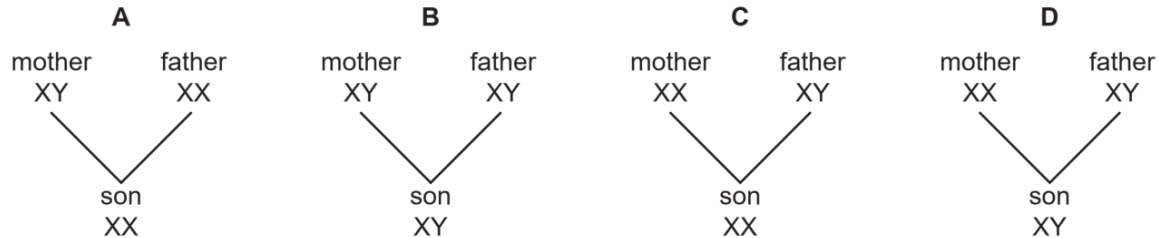
|          | type of reproduction | type of cell division |
|----------|----------------------|-----------------------|
| <b>A</b> | asexual              | meiosis               |
| <b>B</b> | asexual              | mitosis               |
| <b>C</b> | sexual               | meiosis               |
| <b>D</b> | sexual               | mitosis               |

- 4. In cats, the allele for short hair is dominant to the allele for long hair.**

A short-haired cat and a long-haired cat had several families of offspring (kittens). All their kittens were short-haired. One of these kittens matured and mated with a long-haired cat. What would be the expected phenotypes of their offspring?

- A. 1: 1 short to long**
- B. 3: 1 short to long**
- C. all long-haired**
- D. all short-haired**

**5. Which cross shows how a boy inherits sex chromosomes from his parents?**



**6. A dominant allele**

**A. causes only harmful characteristics.**

**B. is responsible for male characteristics.**

**C. never undergoes mutation.**

**D. produces the same phenotype in heterozygotes and homozygotes**

**7. A gene for the colour of hair in mice has two alleles. B represents the allele for grey hair, and b represents the allele for white hair.**

A mouse with grey hair breeds with a mouse with white hair producing four offspring, with genotypes Bb, Bb, bb and bb. What are the genotypes of the parents?

**A. both heterozygous**

**B. both homozygous dominant**

**C. one heterozygous and one homozygous dominant**

**D. one heterozygous and one homozygous recessive**

**8. A heterozygous tall pea plant, Tt, is self-fertilised. What is the offspring most likely to be?**

**A. all tall plants**

**B. all plants of medium height**

**C. one tall plant to three short plants**

**D. three tall plants to one short plant**

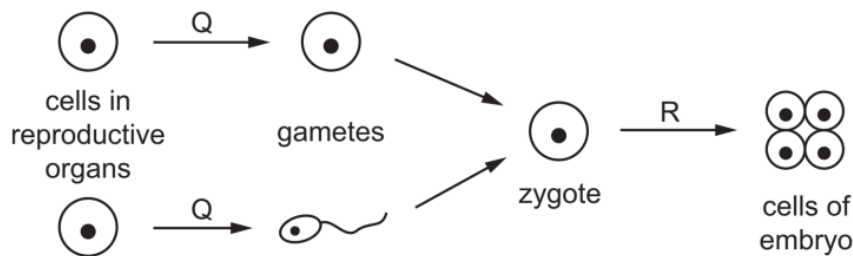
**9. Albinism is an inherited condition in which pigment does not develop in the skin, hair and eyes.**

The allele for albinism is recessive.

What are the chances of albino parents having an albino child?

**A 0%    B 25%    C 75%    D 100%**

**10. The diagram represents processes in sexual reproduction.**



Which processes are represented by stages Q and R ?

|          | Q       | R       |
|----------|---------|---------|
| <b>A</b> | meiosis | meiosis |
| <b>B</b> | meiosis | mitosis |
| <b>C</b> | mitosis | meiosis |
| <b>D</b> | mitosis | mitosis |

**11. A genetic cross between two organisms may be shown as  $Gg \times Gg$ .**

What does g represent?

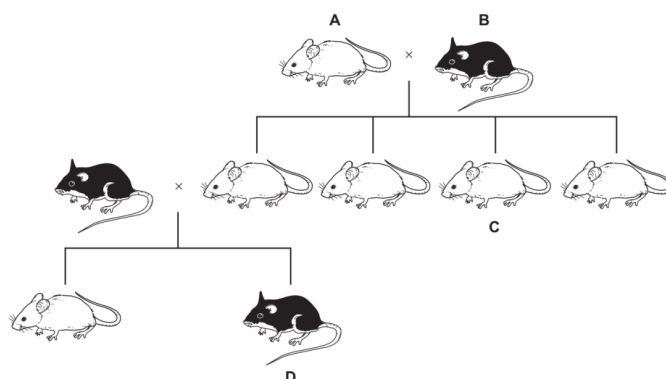
- A.** a dominant allele
- B.** a dominant chromosome
- C.** a recessive allele
- D.** a recessive chromosome

**12. A man has three sons. What is the chance of his next child being a son?**

A 0% B 25% C 50% D 75% Page 3 of 4

**13. The chart shows the inheritance of fur colour in a small mammal.**

If the allele for white fur is dominant, which animal must be heterozygous for the gene controlling fur color?



**14. In an animal, the allele for straight fur is dominant to the allele for curly fur.**

A pair of these animals mate and have nine offspring with straight fur and three with curly fur.

F represents the allele for straight fur and f represents the allele for curly fur.

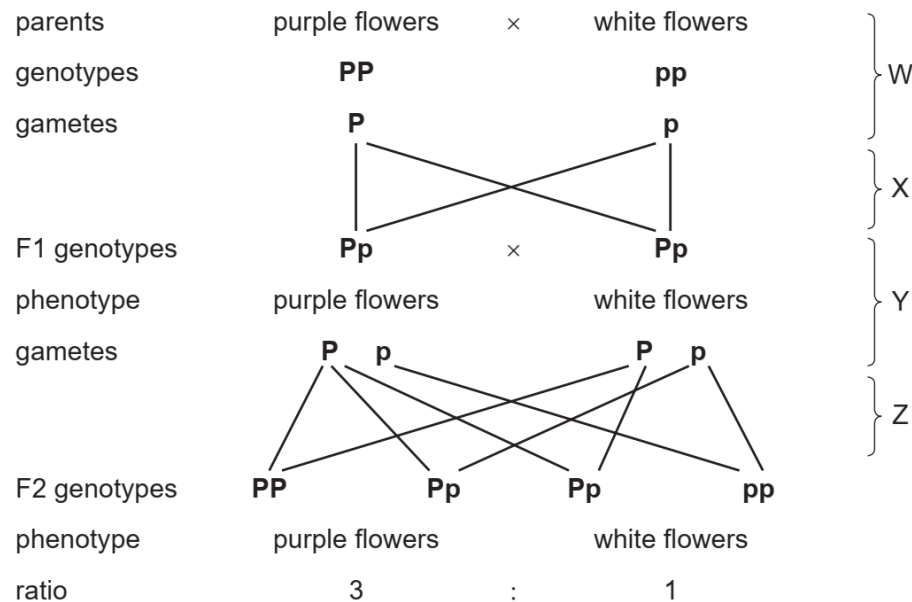
What are the most likely genotypes of the parents?

- A** F and f
- B** FF and ff
- C** FF and Ff
- D** Ff and Ff

15. What defines a diploid nucleus?

- A. a nucleus containing two sets of chromosomes
- B. a nucleus containing two unpaired chromosomes
- C. a nucleus with two alternative forms of a gene
- D. a nucleus with two separate threads of DNA.

16. The diagram shows the inheritance of flower colour in pea plants.



At which stages in the diagram does meiosis occur?

- A W and Y
- B W and Z
- C X and Y
- D X and Z

17. Cystic fibrosis is an inherited disease that occurs when an individual is homozygous for a recessive allele. If parents are both heterozygous for this characteristic, what is the probability that their first child will have cystic fibrosis?

- A 0%
- B 25%
- C 50%
- D 100%

18. When white-flowered pea plants are crossed with red-flowered pea plants, the offspring (F<sub>1</sub>) all have red flowers.

If these F<sub>1</sub> plants pollinate themselves, the next generation (F<sub>2</sub>) contains both red and white flowered plants. Which statement explains this?

- A The allele for red flowers is dominant and the F<sub>1</sub> plants are heterozygous.
- B The allele for red flowers is dominant and the F<sub>1</sub> plants are homozygous.
- C The allele for red flowers is recessive and the F<sub>1</sub> plants are heterozygous.
- D The allele for red flowers is recessive and the F<sub>1</sub> plants are homozygous.

19. Mendel's law of independent assortment can be demonstrated by:

- A. Test cross
- B. Dihybrid cross

### C. Back cross

### D. Monohybrid cross

20. Pea plants were particularly well suited for use in Mendel's breeding experiments for all of the following reasons except that

**A. peas show easily observed variations in a number of characters, such as pea shape**

**B. it is possible to completely control matings between different pea plants.**

**C. it is possible to obtain large numbers of progeny from any given cross.**

**D. peas have an unusually long generation time**

21. Two characters that appear in a 9:3:3:1 ratio in the F<sub>2</sub> generation should have which of the following properties?

**A. Each of the characters is controlled by a single gene.**

**B. The genes controlling the characters obey the law of independent assortment.**

**C. Each of the genes controlling the characters has two alleles.**

**D. A, B, and C are correct.**

22. A 9:3:3:1 phenotypic ratio is characteristic of which of the following?

**A. a monohybrid cross**

**B. a dihybrid cross**

**C. a trihybrid cross**

**D. linked genes**

23. A sexually reproducing animal has two unlinked genes, one for head shape (H) and one for tail length (T). Its genotype is HhTt. Which of the following genotypes is possible in a gamete from this organism?

**A. HT B. Hh C. HhTt D. T**

24. Three babies were mixed up in a hospital. After consideration of the data below, which of the following represent the correct baby and parent combinations?

**A. I-3, II-1, III-2**

**B. I-1, II-3, III-2**

**C. I-2, II-3, III-1**

**D. I-2, II-1, III-3**

|              |         |         |         |
|--------------|---------|---------|---------|
| Couple #     | I       | II      | III     |
| Blood Groups | A and A | A and B | B and O |
| Baby #       | 1       | 2       | 3       |
| Blood Groups | B       | O       | AB      |