

**SBI3U Unit 2 Test: Genetic Processes  
(50 Marks Total)**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

**Marks obtained:**

Category	Total Marks	Possible Marks
Knowledge/Understanding (K/U)		<b>10</b>
Thinking/Investigation (T/I)		<b>20</b>
Communication (C)		<b>5</b>
Application (A)		<b>15</b>
Total		<b>50</b>
Percentage		

**SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)***[K/U, 10: 1 each]***Write your section 1 answers here:**

Question	1	2	3	4	5	6	7	8	9	10
Answer										

K/U	T/I	A	C
/10			

**\*\*NOTE: FOR SECTIONS 1 WRITE YOUR ANSWERS IN THE TABLES ON THE FIRST PAGE OF THIS TEST\*\***

**SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)**

*[K/U, 10: 1 each]*

1. The products of meiosis II are:
 

a) Diploid	c) Imploid
b) Haploid	d) Deeploid
  
2. Alleles for the same trait separate during:
 

a) fertilization	c) meiosis I
b) mitosis	d) meiosis II

Refer to the following diagram for the next two questions:



3. Refer to the illustration above. The cell in diagram 1 is in
 

a) Metaphase	c) Anaphase
b) Telophase	d) Prophase
  
4. Refer to the illustration above. Mitosis ends with the stage shown in diagram
 

a) 1	c) 3
b) 5	d) 4
  
5. How many possible *phenotypes* are there for someone with type A blood?
 

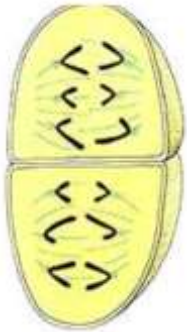
a) 1	c) 3
b) 2	d) 4

6. A test cross is performed by crossing a dominant individual with an unknown genotype with:
- a) a heterozygote
  - b) a homozygous dominant individual
  - c) a homozygous recessive individual
  - d) a dominant individual of unknown genotype
7. In this phase of the cell cycle, the cell prepares for mitosis by duplicating the cell's DNA:
- a) G1 Phase
  - b) S Phase
  - c) G2 Phase
  - d) A Phase
8. Which of these is NOT an advantage of asexual reproduction?
- a) It's fast
  - b) It doesn't require special reproductive structures
  - c) It increases diversity in a population
  - d) It conserves energy
9. In a cross between two heterozygous purple pea plants, 1/4 of the offspring will be white. This is because:
- a) The plants still carry the gene for the recessive trait, it just isn't expressed
  - b) Genes assort independently on the metaphase plate
  - c) The alleles segregate during meiosis, and each parent can give either allele in a gamete
  - d) A and C are both correct
10. Harmful X-linked traits determined by a recessive gene
- a) tend to appear only in females
  - b) do not skip generations
  - c) are usually not passed from father to son
  - d) are usually passed on by carrier males

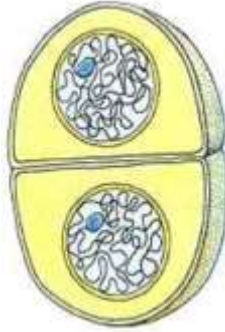
**SECTION 2: Application – Labeling (Question 11)**

11. Label the following diagrams for **Meiosis**:

[A, 8]



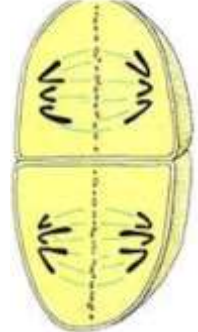
1. \_\_\_\_\_



2. \_\_\_\_\_



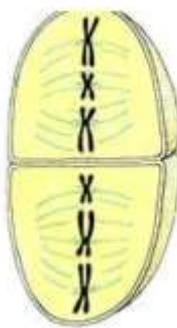
3. \_\_\_\_\_



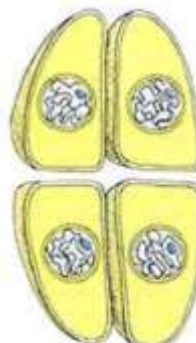
4. \_\_\_\_\_



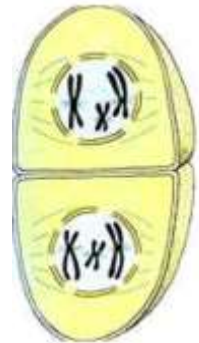
5. \_\_\_\_\_



6. \_\_\_\_\_



7. \_\_\_\_\_



8. \_\_\_\_\_

**SECTION 3: Thinking/Inquiry & Application – Short Answer (Questions 12 – 19)**

[30 total: T/I, 11; A, 19]

12. Do you expect the rate of cell division to be higher in an adult or a child? Explain your answer.

[A, 2]

K/U	T/I	A	C
		/10	

13. Errors that occur during meiosis are present in all cells of the body, whereas errors that occur during mitosis may occur in only a small number of cells. Explain why this occurs.

[T/I, 2]

14. The somatic cells in a horse have 64 chromosomes.

[T/I, 4]

- a. What is the diploid number for a horse?
- b. What is the haploid number for a horse?
- c. How many chromosomes are present in a normal gamete?
- d. How many chromosomes are present in a cell at prophase I?

15. Two parents who have the same phenotype for a given trait produce a child with a different phenotype for the same trait. Use a Punnett square to explain this observation.

[T/I, 3]

K/U	T/I	A	C
	/9		

16. The allele for black hair (B) is dominant to the allele for white hair (b) in guinea pigs.  
Assume that two heterozygous guinea pigs are crossed.

- Write the genotypes of the two parents. [T/I, 2]
- Use a Punnett square to predict the genotypes of the offspring. [T/I, 2]
- What is the probability of producing an offspring with white hair? [T/I, 1]

17. A farmer crosses a black rooster with a white hen. Of the seven offspring, three are black, three are speckled black and white, and one is white.

- What can you infer about the inheritance patterns of the alleles for white and black feathers? [T/I, 3]

- Given the inheritance pattern you described in part (a), what are the expected genotypes and phenotypes of the offspring produced by a cross between a speckled hen and a black rooster? [T/I, 3]

K/U	T/I	A	C
	/11		

18. A variety of reproductive technologies, including cloning, artificial insemination, and in vitro fertilization, are used to control the genetic diversity of farm animals or plant crops. Choose one method and describe how it is used in this manner. [A, 5]

19. genetic testing has many significant benefits. However, many ethical dilemmas are also associated with it. Write a paragraph explaining why you are either for or against prenatal genetic testing. If you found it difficult to support only one side of the issue, explain why. [C, 5]

K/U	T/I	A	C
		/5	/5