SBI3U Grade 11 Biology Final Exam
(100 Marks Total)

Name:_____

Signature:_____

Marks obtained:

Category	Total Marks	Possible Marks	KICA Grade	Final Grade
Knowledge/Understanding (K/U)		**20**	**x 20%**	
Thinking/Investigation (T/I)		**40**	**x 30%**	
Communication (C)		**10**	**x 20%**	
Application (A)		**30**	**x 30%**	
Total		**100**	**100%**	
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										
Question	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Answer										

K/U	T/I	A	C

Name:

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

SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-20)

[K/U, 20: 1 each]

1. Which row in the table below contains the two organisms that are most closely related?

Scientific Names of Various Organisms

Row	Organism 1	Organism 2
A	*Felis domesticus*	*Mephitis mephitis*
B	*Canis familiaris*	*Canis latrans*
C	*Canis familiaris*	*Acrocephalus familiaris*
D	*Myotis lucifungus*	*Stagmomantis carolina*
E	*Ursus americanus*	*Ailuropoda melanoleuca*

a) A
b) B
c) C
d) D
e) E

2. Which statement about vascular plants is false?

a) Most vascular plants have true roots, stems, and leaves.
b) The sporophyte is the dominant generation for vascular plants.
c) All vascular plants produce seeds for reproduction.
d) Vascular plants display more variability than non-vascular plants.
e) Vascular tissue in these plants consists of xylem and phloem.

3. Which term describes the variety of internal and external forms in living organisms?

a) ecosystem diversity
b) structural diversity
c) genetic diversity
d) species diversity
e) biological diversity

4. Which would least likely be used to determine how closely two organisms are related?

a) anatomical evidence using fossils
b) developing scientific models using biodiversity data
c) anatomical evidence from living species
d) physiological evidence, such as protein structure
e) DNA evidence from living or dead organisms

5. Mendel's law of dominance states that

a) in an organism heterozygous for a trait, only one of the two alleles is expressed
b) two alleles that determine a characteristic will separate when sex cells form
c) an allele that is expressed is recessive
d) the inheritance of a particular allele is not affected by the inheritance of other alleles
e) all of the above

6. Due to the similar behaviour of genes and chromosomes, we can conclude that

a) genes and chromosomes perform similar functions
b) chromosomes pairs separate during meiosis
c) genes linked on the same chromosome are sometimes separated
d) genes are located on chromosomes
e) none of the above

7. The genotype describes

a) the physical appearance of an organism
b) one allele of a gene
c) the combination of two or more alleles
d) the codons of the genes
e) all of the above

8. Nondisjunction results in

   a) failure to produce a protein
   b) a missing chromosome in a gamete
   c) failure to produce a viable gamete
   d) incomplete dominance always
   e) all of the above

9. On which unit does natural selection work directly?

   a) the individual
   b) the population
   c) the gene
   d) the cell
   e) the species

10. Which of the following factors is most likely to contribute to gene flow between populations?

    a) random mating
    b) migration
    c) mutation
    d) genetic drift
    e) inbreeding

11. Darwin proposed that natural selection occurs in an environment by

    a) favoring heritable features that make the organism better suited to survive and reproduce.
    b) producing a constant number of offspring while in that environment.
    c) surviving for a fixed amount of time.
    d) resisting the environment and keeping the environment from changing.
    e) favoring those individuals with the most favorable acquired characteristics.

12. Which one of the following is not a mechanism of natural evolutionary change?

    a) mutation
    b) migration
    c) genetic drift
    d) non-random mating
    e) artificial selection

13. Which organelle do plants rely on for photosynthesis?

a) cell wall
b) chloroplast
c) mitochondrion
d) plasma membrane
e) chlorophyll

14. The phloem is vascular tissue that

a) consists of dead tubular cells
b) transports sugar from the leaves to all parts of the plant
c) is present only in the stems
d) transports water from the roots to the leaves
e) has no specialized function

15. Which of these structures is the outcome of reproduction in angiosperms?

a) flower
b) seed
c) apple
d) pollen
e) spermatocyte

16. One thing that does not occur during inspiration is

a) the intercostal muscles of the rib cage contract
b) the rib cage rises
c) the rib cage extends out from the body
d) the diaphragm relaxes
e) air moves into the lungs

17. The surface area of the small intestine is greatly increased by

a) villi
b) chemical digestion
c) peristalsis
d) rhythmical segmentation
e) lacteals

18. Although the stomach is normally thought of as the major organ in the digestive process, most chemical digestion actually occurs in the

a) mouth
b) appendix
c) colon
d) large intestine
e) small intestine

19. The trachea connects the larynx to the lower passages of the respiratory system. Th e trachea is located at the front of the neck and is composed of cartilage and ligaments. Complete the following statement by choosing the correct pair of terms below. The trachea branches into two smaller passages called _____, which enter into the right and left _____:

a) bronchioles; atria
b) alveoli; lungs
c) bronchi; lungs
d) glottis; ventricles
e) alveoli; atria

20. Complete the following statement by choosing the correct pair of terms below. The blood in capillaries has a(n) concentration of CO2 relative to the alveoli because it is body tissues.

a) higher, going to
b) lower, returning from
c) higher, returning from
d) lower, going to
e) unchanged, going to

Name:

SECTION 2: Thinking/Inquiry (Question 21-25) *[T/I, 40 marks total]*

21. You have designed an experiment to show that mould spores landing on a favourable surface will germinate and produce hyphae. You have placed two slices of bread on a plate for several hours, and then sealed them into plastic bags and put the bags into the dark.
    a. Complete the procedure for this experiment.
    b. How long would you wait before checking the bread? *(T/I 2 marks)*
    c. What would you look for? Would you check both slices at the same time? (*T/I, 2 marks)*
    d. What data would you collect? *(T/I, 2 marks)*
    e. Create a data table showing results from your two pieces of bread if (a) conditions were not adequate to support the growth of mould, and (b) conditions were adequate to support the growth of mould. (T/I, 4 marks)

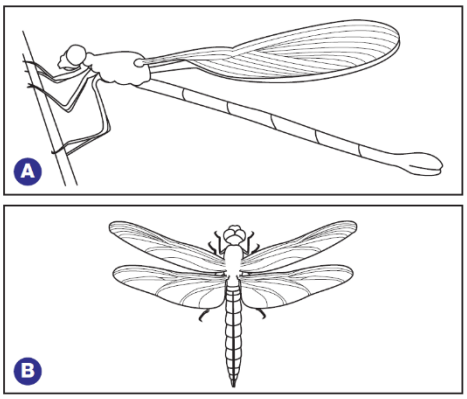
K/U	T/I	A	C

22. Sometimes we are able to tell the genotype of an organism by knowing the phenotype. In the case of Mendel's pea plants, for example, round seeds (R) are dominant over wrinkled seeds (r).
    a. For which of the plants carrying various combinations of these traits could you tell the genotype by observation alone? Explain. *[T/I, 5]*
    b. Mendel worked out a method for determining the genotype when he could not tell just by looking at the phenotype alone. What was the system he developed? Explain the genotypes he determined using this system.

[T/I, 5]

23. *1A Front and hind wings similar in size and shape, and folded parallel to the body when at rest…* ***damselflies***

    1B Hind wings wider than front wings near base, and extend on either side of the body when at rest… ***dragonflies***



    Use the dichotomous key above to answer the following questions.
    a. Identify the organisms shown in the diagrams. Explain how you came to your decision. *[T/I, 5]*
    b. From the key and the diagrams above, explain why you could conclude that dragonflies and damselflies evolved from a common ancestor. *[T/I, 5]*

K/U	T/I	A	C

24. The mammalian respiratory system is sometimes described as employing "negative pressure. " The frog's respiratory system, on the other hand, uses "positive pressure."
    a. To what do these terms refer? *[T/I, 5]*
    b. Design an experiment that will test which system is more efficient at delivering oxygen from the environment to the lungs. *[T/I, 5]*

K/U	T/I	A	C
	/10		

SECTION 3: Applications (Questions 25 – 30) *[A, 30 marks total]*

25. The heterotrophic protist *Hatena* behaves like a predator until it ingests a green alga. Once ingested the alga loses its flagella and cytoskeleton. The *Hatena*, now a host, switches to photosynthetic nutrition, gains the ability to move toward light, and loses its feeding apparatus. Explain how this behaviour could be linked to endosymbiosis and the evolution of eukaryotic cells from prokaryotic cells *[A, 6]*

26. A certain breed of cattle in England produces good meat when a particular gene is heterozygous. That same gene is lethal when it is homozygous recessive. How would a farmer produce the best meat without losing any cattle? *[A, 6]*

K/U	T/I	A	C

27. The Rocky Mountains used to be much higher than they are today. Over time, the mountains have changed—they have been eroded by weather and are not as tall today as they were in the past. Is this an example of evolution? Explain your answer with a definition of evolution in your own words. *[A, 6]*

28. A 55-year-old male has a persistent cough that produces mucus. He states that he is exposed to airborne irritants, including high concentrations of dust, in the workplace. He has worked at the same place for about 10 years.
    a. Which respiratory disorder is this person likely suffering from? Explain. *[A, 3]*
    b. Is there more than one possibility based on the given information? Explain. *[A, 3]*

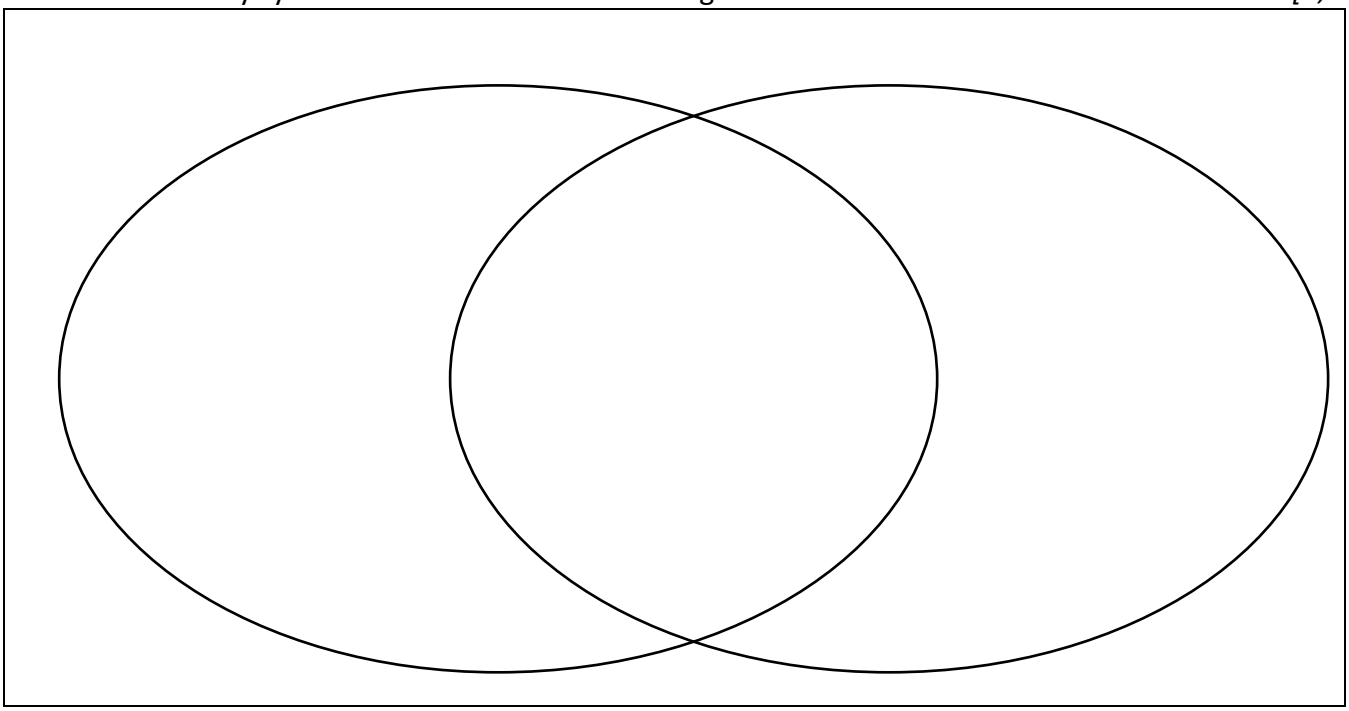
K/U	T/I	A	C

29. The drooping, bell-shaped flowers of Canadian columbine (*Aquilegia canadensis*) are adapted for cross-pollination. However, if the flower has not been pollinated previously, self-pollination can occur. If cross-pollination occurs after self-pollination has taken place, the pollen from the cross-pollination reaches the base of the style before the pollen from self-pollination. Explain how this adaptation for reproduction benefits the plant.

SECTION 4: Communication (Questions 30 – 31) *[C, 10 marks total]*

30. Being overweight is a concern for many North Americans. A weight-loss consultant claims the problem can easily be solved by surgically removing sections of obese people's digestive systems. You wish to demonstrate to your friends that such a solution could prove dangerous. Prepare a chart that lists 5 components of the human digestive system in one column and the consequences of removing (a) part of and (b) the entire component in a second column. *[C, 5]*

31. Write at least 3 difference and two similarities between the vascular system of plants and the circulatory system of animals in the Venn Diagram below. *[C, 5]*



K/U	T/I	A	C