

**Lorne Park Secondary School  
Mock Exam**

**Time: 1.5 hours  
Teachers: Ms. Hutson & Ms. Vanstone**

<b>Part A</b>	<b>True/ False and Multiple Choice</b>	<b>55 marks</b>	<b>Allow 50 min</b>
<b>Part B</b>	<b>Short Answer and Problems</b>	<b>35 marks</b>	<b>Allow 40 min</b>

**Part A**

**True/False**

*Indicate whether the sentence or statement is true or false.*

- \_\_\_ 1. Cells having a nuclear membrane surrounding a well-defined nucleus are classified as prokaryotic cells.
- \_\_\_ 2. Plant and animal cells contain all of the same cytoplasmic organelles.
- \_\_\_ 3. Meiosis is a process by which gametes are formed.
- \_\_\_ 4. In humans, the haploid number of chromosomes is 46 and the diploid chromosome number is 23.
- \_\_\_ 5. All daughter cells produced by meiosis are genetically identical to each other and to the parent.
- \_\_\_ 6. In snapdragons, red-flowering plants combine with white-flowering plants to produce pink-flowering plants. This is an example of codominance.
- \_\_\_ 7. It is possible to have more than two alleles for one gene.
- \_\_\_ 8. The probability of two heterozygous individuals having an offspring heterozygous for that gene is 1/2.
- \_\_\_ 9. The cardiac sphincter is at the end of the stomach located closest to the esophagus.
- \_\_\_ 10. An open circulatory system is more efficient in delivering oxygen to cells than a closed circulatory system.
- \_\_\_ 11. The semilunar valves are located between the atria and the ventricles.
- \_\_\_ 12. Air moves into the lungs from outside the body when air pressure within the lungs is less than the atmospheric pressure.
- \_\_\_ 13. The internal intercostal muscles pull the rib cage downward when you are inflating a balloon.
- \_\_\_ 14. Viruses are not represented in the six-kingdom system because they do not exhibit enough different characteristics for scientists to classify them.
- \_\_\_ 15. Cephalochordata and Urochordata do not have backbones or vertebral columns despite being members of the chordates.
- \_\_\_ 16. The egg-laying mammals are the marsupials.

### Modified True/False

Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.

- \_\_\_ 17. *Adaptations* are any characteristics that allow an organism to reproduce more successfully.  
\_\_\_\_\_
- \_\_\_ 18. Sharks, snakes, and crocodiles are able to grow new teeth all of their lives. This is considered to be an example of *analogous structures*. \_\_\_\_\_
- \_\_\_ 19. There are a great variety of breeds of dogs. This is considered to be an example of *natural selection*.  
\_\_\_\_\_
- \_\_\_ 20. A single species may change through time to become *another species*. \_\_\_\_\_

### Multiple Choice

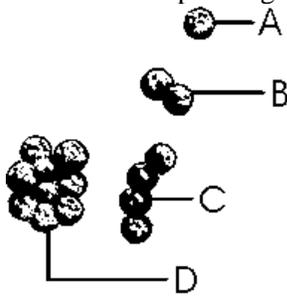
Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_ 21. Energy released during cellular respiration is stored in a compound called  
a. glucose. d. DNA.  
b. ADP. e. RNA.  
c. ATP.
- \_\_\_ 22. At what organelle are amino acids bonded together?  
a. endoplasmic reticulum  
b. nucleus  
c. vacuole  
d. ribosome  
e. amino acids are not bonded at an organelle
- \_\_\_ 23. The organelle responsible for storage and packaging of proteins is the  
a. nucleus. d. vesicle.  
b. ribosome. e. Golgi apparatus.  
c. endoplasmic reticulum.
- \_\_\_ 24. If a cell with 36 chromosomes undergoes mitosis, each daughter cell will have  
a. 36 chromosomes. d. 9 chromosomes.  
b. 72 chromosomes. e. 6 chromosomes.  
c. 18 chromosomes.
- \_\_\_ 25. Which cells in the human body have a diploid number of 46 chromosomes in their nuclei?  
a. all cells  
b. only the reproductive cells  
c. only cells that are produced by meiosis  
d. only zygotes  
e. only cells that are produced by mitosis
- \_\_\_ 26. The term "phenotype" may be defined as  
a. genes on the Y chromosome.  
b. the genetic makeup of the individual.  
c. genes on the X chromosome.  
d. the gene pool expression of a population.  
e. an observable expression of genotype.

- \_\_\_ 27. In the cross of  $Tt \times Tt$ , the proportion of the offspring that will have the same genotype as the parents is
- 25%.
  - 50%.
  - 75%.
  - 100%.
  - none of the above.
- \_\_\_ 28. To determine if an organism with a dominant phenotype is heterozygous, the organism is mated to an individual that is
- heterozygous for the trait in question.
  - homozygous recessive for the trait in question.
  - homozygous dominant for the trait in question.
  - of the same genotype as the organism being tested.
  - opposite to the genotype as the organism being tested.
- \_\_\_ 29. The rare trait called ocular albinism (almost complete absence of eye pigment) is inherited as a sex-linked recessive trait. A man with ocular albinism marries a woman who is a carrier of this condition. Which of the following is the best prediction concerning their offspring?
- All their children of both sexes will have ocular albinism.
  - All their sons will have ocular albinism, and all their daughters will be carriers.
  - About half the sons and half the daughters will have ocular albinism, the other half of the sons will have normal eyesight, and the other half of the daughters will be carriers of the condition.
  - None of their children will have ocular albinism, but all their daughters will be carriers.
  - None of the above
- \_\_\_ 30. Familial intestinal polyposis results in multiple fingerlike growths (polyps) from the lining of the large intestine. It is inherited as a dominant trait. Let P represent the allele producing the polyps and p represent the normal allele. One parent is Pp and the other pp. If the couple has four children, how many would be expected to have the familial intestinal polyposis phenotype?
- 1
  - 2
  - 3
  - 4
  - 0
- \_\_\_ 31. In which of the following lists are the events listed in the sequence in which they actually occur?
- ingestion, absorption, digestion, egestion
  - ingestion, digestion, absorption, egestion
  - absorption, ingestion, egestion, digestion
  - absorption, digestion, ingestion, egestion
  - digestion, ingestion, absorption, egestion
- \_\_\_ 32. Which of the following is not found in digestive fluids in the stomach?
- hydrochloric acid
  - pepsinogen
  - pepsin
  - amylase
  - mucus
- \_\_\_ 33. Which of the following enzymes breaks down fats?
- amylase
  - maltase
  - trypsin
  - lipase
  - dissacharidase
- \_\_\_ 34. What is the role of the bicarbonate ion in the digestive process?
- to initiate the digestion of starches
  - to emulsify fats
  - to lower the pH of material entering the small intestine from the stomach
  - to raise the pH of material entering the small intestine from the stomach
  - to stimulate the release of gastric juices

- \_\_\_ 35. Which of the following is not a type of white blood cell?
- a. basophil
  - b. eosinophil
  - c. lymphocyte
  - d. monocyte
  - e. platelet
- \_\_\_ 36. Which of the following is true of arteries?
- a. They always carry oxygenated blood.
  - b. They always carry deoxygenated blood.
  - c. They are the site of exchange of materials between the blood and the tissues.
  - d. They always carry blood away from the heart.
  - e. They always carry blood toward the heart.
- \_\_\_ 37. Which of the following correctly outlines the pathway that is followed by a red blood cell that first enters the heart at the vena cava?
- a. left atrium, left ventricle, pulmonary artery, lungs, pulmonary veins, right atrium, right ventricle, aorta
  - b. left atrium, right ventricle, pulmonary vein, lungs, pulmonary artery, right atrium, left ventricle, aorta
  - c. left atrium, left ventricle, pulmonary vein, lungs, pulmonary artery, right atrium, right ventricle, aorta
  - d. right atrium, right ventricle, pulmonary artery, lungs, pulmonary veins, left atrium, left ventricle, aorta
  - e. right atrium, right ventricle, pulmonary veins, lungs, pulmonary artery, left atrium, left ventricle, aorta
- \_\_\_ 38. The heart's "pacemaker" is the
- a. bicuspid node.
  - b. Purkinje node.
  - c. atrioventricular node.
  - d. sinoatrial node.
  - e. semilunar node.
- \_\_\_ 39. The highest blood pressure occurs in the
- a. veins.
  - b. capillary beds.
  - c. arterioles.
  - d. venules.
  - e. arteries.
- \_\_\_ 40. Lymph is a fluid that most closely resembles
- a. water.
  - b. a salt solution.
  - c. extracellular fluid.
  - d. blood plasma.
  - e. cytoplasm.
- \_\_\_ 41. Gases diffuse
- a. from an area of low pressure to another area of low pressure.
  - b. from an area of high pressure to another area of high pressure.
  - c. from an area of high pressure to an area of low pressure.
  - d. from an area of low pressure to an area of high pressure.
  - e. from an area where they are not needed to an area where they are needed.

\_\_\_ 42. Which label is pointing to a sample of staphylococcus?



- a. A  
b. B  
c. C  
d. D  
e. none of these
- \_\_\_ 43. With the exception of birds and mammals, all other vertebrates are cold-blooded. Cold-blooded organisms are more correctly referred to as which of the following?
- a. endotherms  
b. ectotherms  
c. mesotherms  
d. epitherms  
e. none of the above
- \_\_\_ 44. The advent of the four-chambered heart first appears in which of the following groups?
- a. amphibians  
b. birds  
c. fish  
d. mammals  
e. reptiles
- \_\_\_ 45. What is the most distinctive feature of mammals?
- a. hair  
b. warm-blooded  
c. sweat glands  
d. mammary glands  
e. placenta
- \_\_\_ 46. How did the development of a coelom aid animals?
- a. aided digestion  
b. aided respiration  
c. allowed for an increase in surface area  
d. allowed for more space for internal organs  
e. none of the above
- \_\_\_ 47. Fungi are vital to other organisms and to the proper functioning of ecosystems through their role as which of the following?
- a. producers  
b. carnivores  
c. herbivores  
d. decomposers  
e. consumers
- \_\_\_ 48. During the early stages of pregnancy, human embryos have paired gill pouches. This is an example of
- a. macroevolution  
b. molecular record  
c. vestigial structures  
d. development  
e. homology
- \_\_\_ 49. The most impressive direct evidence of evolution comes from the study of
- a. the fossil record  
b. present-day organisms  
c. the geographic distribution of plant and animal species  
d. homologous and analogous structures present in embryological development  
e. RNA structure

- \_\_\_\_\_ 50. Which of the following is a definition of evolution?
- a process by which populations exhibit gradual changes over several generations
  - a theory that best describes how species living today are descendants of species of past generations
  - provides an explanation of how the great biological diversity present today occurred and is increasing
  - an explanation of how mutations change the composition of a population
  - all of the above
- \_\_\_\_\_ 51. The term genetic drift is defined as of which of the following?
- any change in gene or allele frequencies in a population
  - any random change in gene or allele frequencies in a small population
  - a rapid population decrease
  - the establishment of a population in a new region
  - the movement of alleles from one population to another
- \_\_\_\_\_ 52. Phylogeny is best described as which of the following?
- the evolutionary history of a species or group
  - all of the descendants of a common ancestor
  - a system that groups organisms according to similar morphologies
  - a diagram that shows the evolutionary history of groups of species
  - a system that groups organisms according to shared derived traits
- \_\_\_\_\_ 53. A clade is best described as which of the following?
- the evolutionary history of a species or group
  - all of the descendants of a common ancestor
  - a system that groups organisms according to similar morphologies
  - a diagram that shows the evolutionary history of groups of species
  - a system that groups organisms according to shared derived traits
- \_\_\_\_\_ 54. The gene makeup of an organism for a particular trait is its
- |               |                   |
|---------------|-------------------|
| a. genotype.  | d. recessiveness. |
| b. pedigree.  | e. dominance.     |
| c. phenotype. |                   |
- \_\_\_\_\_ 55. A man is a hemophiliac. This indicates that he
- is afraid of the sight of blood.
  - inherited the condition from his father.
  - inherited the condition from his mother.
  - is carrying a parasitic organism in his blood.
  - has an allergic reaction to blood.

## Matching

*Match the following parts of the mammalian heart with the appropriate descriptions.*

- |                       |                            |
|-----------------------|----------------------------|
| a. pulmonary arteries | e. superior vena cava      |
| b. septum             | f. semilunar valves        |
| c. aorta              | g. atrioventricular valves |
| d. pulmonary veins    |                            |

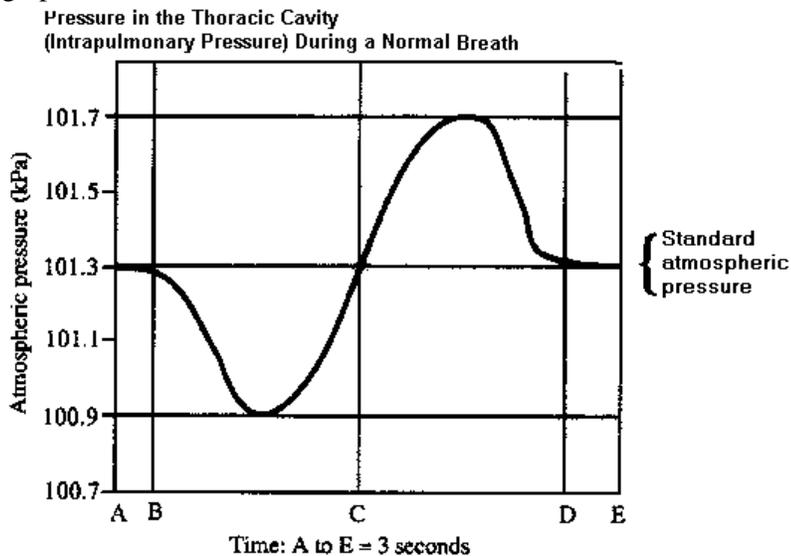
- \_\_\_ 56. collects blood from the upper part of the body and delivers it to the heart
- \_\_\_ 57. separates the two chambers on the same side of the heart
- \_\_\_ 58. delivers deoxygenated blood to the lungs
- \_\_\_ 59. prevents blood leaving the heart from re-entering the heart
- \_\_\_ 60. separates the two halves of the heart
- \_\_\_ 61. returns oxygenated blood to the heart
- \_\_\_ 62. delivers oxygenated blood from the heart to the body

## **Part B:**

### **Short Answer**

1. Explain what is meant by the term vertebrate. (1)
2. Explain what is meant by the term genetic drift. Include an example to demonstrate genetic drift. (2)
3. Explain what is meant by the term analogous feature. Include an example of an analogous feature. (2)
4. What major characteristic differentiates the invertebrates from the vertebrates? Why did the development of this key feature allow vertebrates to colonize terrestrial habitats? (4)
5. A patient is given a sedative that inhibits nerves leading to the pharynx, including those that control the epiglottis. What precautions would you take with this patient? Give your reasons. (2)
6. It has been estimated that for every extra kilogram of body fat, an additional kilometer of circulatory vessels is required to supply the tissues with nutrients. Explain why obesity has often been associated with high blood pressure. (3)

7. The air pressure in the lungs is called the intrapulmonary pressure. Study the graph below, which shows changes in the intrapulmonary pressure. Section A-B on the graph shows the air pressure when the lungs are at rest, and section D-E shows the air pressure when the lungs are inflated after a complete breath. Answer the questions following the graph.



- Describe the breathing movements that would result from the pressure changes shown in B-C and C-D. (2)
- What changes in volume occur during B-C and C-D? (2)

### Problems

- For horses, the trotter characteristic is dominant over the pacer characteristic. A male, who is described as a trotter, mates with three different females and each female produces a foal. The first female, who is a pacer, gives birth to a foal that is a pacer. The second female, also a pacer, gives birth to a foal that is a trotter. The third female, a trotter, gives birth to a foal that is a pacer. Determine the genotypes of the male, all three females and the three foals sired. (5)
- In mice, grey fur is recessive and white fur is dominant. In a mouse population that lives in the LPSS staff room, there are 35 white mice and 8 grey mice. Use the Hardy-Weinberg principle to find the frequency of the grey allele and the white allele in this population. (3)
- Roan cattle have one red hair for every white hair. Long horns are dominant over short horns. If a long-horned, red-haired cow is crossed with a short-horned, white-haired bull, what would be the phenotypic ratio for the next two generations?  
Give proof by showing the Punnet squares for the P1 and P2 generations and the F1 and F2 offspring. (5)

Mock Exam

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Answer Section**

**TRUE/FALSE**

1. ANS: F
2. ANS: F
3. ANS: T
4. ANS: F
5. ANS: F
6. ANS: F
7. ANS: T
8. ANS: T
9. ANS: T
10. ANS: F
11. ANS: F
12. ANS: T
13. ANS: T
14. ANS: F
15. ANS: T
16. ANS: F

**MODIFIED TRUE/FALSE**

17. ANS: T
18. ANS: F, homology
19. ANS: F, artificial selection
20. ANS: T

**MULTIPLE CHOICE**

21. ANS: C
22. ANS: D
23. ANS: E
24. ANS: A
25. ANS: E
26. ANS: E
27. ANS: B
28. ANS: B
29. ANS: C
30. ANS: B
31. ANS: B
32. ANS: D
33. ANS: D
34. ANS: D

- 35. ANS: E
- 36. ANS: D
- 37. ANS: D
- 38. ANS: D
- 39. ANS: E
- 40. ANS: D
- 41. ANS: C
- 42. ANS: D
- 43. ANS: C
- 44. ANS: B
- 45. ANS: D
- 46. ANS: D
- 47. ANS: D
- 48. ANS: C
- 49. ANS: A
- 50. ANS: E
- 51. ANS: B
- 52. ANS: A
- 53. ANS: B
- 54. ANS: A
- 55. ANS: C

**MATCHING**

- 56. ANS: E
- 57. ANS: G
- 58. ANS: A
- 59. ANS: F
- 60. ANS: B
- 61. ANS: D
- 62. ANS: C