

**Name:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**MULTIPLE CHOICE**

**Choose the one alternative that best completes the statement or answers the question.**

**1. Which of the following is found within mitochondria?**

- A: endoplasmic reticulum
- B: patella
- C: Golgi apparatus
- D: cristae

**2. When two bacteria exchange genetic information, how is the process called?**

- A: conjugation
- B: mutation
- C: transcytosis
- D: euglena

**3. Which enzyme is synthesizing DNA?**

- A: collagen
- B: lactalbumin
- C: hemoglobin
- D: DNA polymerase
- E: serum albumin

**4. Which of the following elements is the most important for living creatures?**

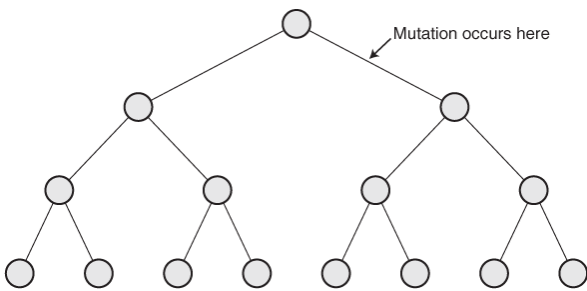
- A: Fe
- B: Ni
- C: Co
- D: He
- E: Li

**5. Male sea lions can be twice the size of female sea lions. Which best explains the difference in size between male and female sea lions?**

- A: orcas and sharks prey on sea lions
- B: male and female sea lions hunt on land and at sea
- C: sea lions hold their breath while diving
- D: males compete with one another for females

**6. The diagram shows three generations of cells produced by a single cell through mitosis. In the process, a single mutation occurred at the point indicated. The mutation caused changes within a dominant allele. How many of the 15 cells contain the mutation?**

- A: 1
- B: 2
- C: 4
- D: 7
- E: 11



**7. What of the following stores bile, which is needed to digest lipids (including fats)?**

- A: liver
- B: gall bladder
- C: small intestine
- D: stomach

**8 Which statements are true about chromosomes?**

- A: they are present in the cytoplasm
- B: they are surrounded by membranes
- C: are smaller than genes
- D: can not be seen in light microscope
- E: they contain DNA

**9. How many chromosomes are found in a human cells?**

- A: 46,
- B: 23+Y
- C: 23+XY
- D: 46+XY
- E: 23

**10. Crossing yellow peas with green peas, in the first generation we get only yellow colored peas, in the second generation we have 3 fold more yellows than greens. What can we say about the inheritance of pea color?**

- A: yellow is a dominant trait
- B: green is a dominant trait
- C: it is an example of intermediate inheritance
- D: yellow parents are heterozygotic
- E: it is a co-dominant inheritance

**11. A bacterium divides once in every hour. Approximately how many bacterial cells will be produced after 12 hours?**

- A: 100
- B: 400
- C: 1000
- D: 4000
- E: 10 000

**12. The process of converting a DNA sequence to an mRNA is called transcription. What is the process of converting an mRNA molecule to a protein called?**

- A: replication
- B: transcription II
- C: transduction
- D: translation

**13. The cell membrane of the red blood cell will allow water, oxygen, carbon dioxide, and glucose to pass through. Because other substances are blocked from entering, this membrane is called:**

- A: perforated
- B: semi-permeable
- C: non-conductive
- D permeable

**14. Eukaryotic cells are more complex than prokaryotic cells because they:**

- A: are much smaller
- B: have membranes
- C: have a higher rate of reproduction
- D: have nuclei

**15. Which molecule in plant cells first captures the radiant energy from sunlight?**

- A: glucose
- B: carbon dioxide
- C: chlorophyll
- D: adenosine triphosphate

**16. A cell from heart muscle would probably have an unusually high proportion of**

- A: lysosomes
- B: mitochondria
- C: mRNA
- D: lipids

**17. Which of the following best describes meiosis?**

- A: it is carried out in all tissues that require cell replacement
- B: it occurs only in cells in the reproductive organs of the organism
- C: it happens in all tissues except the brain and spinal cord
- D: it is the first stage of mitosis

**18. In fruit flies, the gene for eye color has a red (R) dominant allele and the allele coding for sepia color (r) is recessive. What are the possible combinations of alleles in the offspring of two red-eyed heterozygous flies (Rr)?**

- A: RR only
- B: rr only
- C: Rr and rr only
- D: RR, Rr, and rr

**19. If a baby boy inherits a recessive allele from his mother, in which circumstance would he most likely show the trait coded for by the recessive allele?**

- A: the baby inherits the dominant allele from his father
- B: the allele is on an autosomal chromosome and the baby is a twin
- C: the allele is on the X chromosome
- D: the allele is on the Y chromosome

**20. Mendel hypothesized that reproductive cells have only one 'factor' for each inherited trait. This hypothesis is supported by the observation that**

- A: haploid cells are produced by mitosis
- B: diploid cells are produced by mitosis
- C: haploid cells are produced by meiosis
- D: diploid cells are produced by meiosis

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

**MULTIPLE CHOICE**

**Choose the one alternative that best completes the statement or answers the question.**

- The species  $^{35}_{17}\text{Cl}$  contains**
  - 18 electrons and 17 protons
  - 17 neutrons and 35 electrons
  - 17 protons and 18 neutrons
  - 18 protons and 17 neutrons
  - 17 protons and 35 neutrons
- Caffeine, the stimulant in coffee and tea, has the molecular formula of  $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$ . What is the mass of 0.012 moles of the compound? (Atomic weights: C = 12; H = 1; N = 14; O = 16)**
  - 0.516 g
  - 1.632 g
  - 2.328 g
  - 2.880 g
  - 16.167 g
- The neutral atoms of all of the isotopes of the same element have**
  - different numbers of protons.
  - equal numbers of neutrons.
  - the same number of electrons.
  - the same mass numbers.
  - the same masses.
- Which of the following elements is a halogen?**
  - hydrogen
  - sodium
  - neon
  - fluorine
  - phosphorous
- Which of the following molecules has a triple bond?**
  - $\text{NH}_3$
  - $\text{N}_2$
  - $\text{CO}_2$
  - $\text{H}_2\text{O}$
  - $\text{O}_2$

6. **Determine the number of moles of solute present in 20 cm<sup>3</sup> of 0.38 mol/dm<sup>3</sup> HCl solution.**  
A) 0,0076 moles  
B) 0,019 moles  
C) 0,076 moles  
D) 7,6 moles  
E) 13,87 moles
7. **When a substance is being oxidized, it**  
A) loses oxygen  
B) loses electron  
C) loses a proton  
D) gains electron  
E) gains proton
8. **Equilibrium is reached in chemical reactions when:**  
A) the concentrations of reactants and products become equal.  
B) the forward reaction stops.  
C) the reverse reactions stops.  
D) the rates of the forward and reverse reactions become equal.  
E) all chemical reactions stop.
9. **What is the oxidation number of chlorine in HClO<sub>4</sub>?**  
A) -1  
B) 0  
C) 1  
D) 5  
E) 7
10. **Choose the strongest acid from the following:**  
A) Na<sub>2</sub>CO<sub>3</sub>  
B) Ca(OH)<sub>2</sub>  
C) NH<sub>4</sub>OH  
D) H<sub>2</sub>SO<sub>4</sub>  
E) H<sub>2</sub>CO<sub>3</sub>
11. **Which of the following is a neutralization (acid-base) reaction?**  
A)  $2 \text{Na} + 2 \text{H}_2\text{O} = 2 \text{NaOH} + \text{H}_2$   
B)  $\text{BaCl}_2 + \text{H}_2\text{SO}_4 = \text{BaSO}_4 + 2 \text{HCl}$   
C)  $\text{Mg} + 2 \text{HCl} = \text{MgCl}_2 + \text{H}_2$   
D)  $\text{Na}_2\text{CO}_3 + 2 \text{HCl} = 2 \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$   
E)  $\text{H}_2\text{CO}_3 + \text{Ca}(\text{OH})_2 = \text{CaCO}_3 + 2 \text{H}_2\text{O}$
12. **What is the pH of a 0.025 mol/dm<sup>3</sup> solution of HCl?**  
A) 0.25  
B) 0.60  
C) 1.60  
D) 3.69  
E) 9.75
13. **Which of the following represents the correct formula for aluminum nitrate?**  
A) AlN  
B) AlNO<sub>2</sub>  
C) AlNO<sub>3</sub>  
D) Al(NO<sub>3</sub>)<sub>2</sub>

- E)  $\text{Al}(\text{NO}_3)_3$
14. **Which of the following will undergo an addition reaction with chlorine?**  
A) methane  
B) benzene  
C) chloromethane  
D) ethene  
E) ethanol
15. **Which of the following formulas represents an alkene?**  
A)  $\text{CH}_3\text{CH}_2\text{CH}_3$   
B)  $\text{CH}_3\text{CH}_3$   
C)  $\text{CH}_3\text{CH}_2\text{CHCH}_2$   
D)  $\text{CHCH}$   
E)  $\text{CH}_3\text{CH}_2\text{Cl}$
16. **Which of the following functional groups does not contain oxygen?**  
A) hydroxyl  
B) carbonyl  
C) amino  
D) amide  
E) carboxyl
17. **Which of the following compounds has the highest boiling point?**  
A) butane  
B) methylpropane  
C) 1-propanol  
D) methyl ethyl ether  
E) ethyne
18. **Which compound is an ester?**  
A)  $\text{CH}_3\text{OH}$   
B)  $\text{CH}_3\text{COH}$   
C)  $\text{CH}_3\text{COOH}$   
D)  $\text{CH}_3\text{COOCH}_3$   
E)  $\text{CH}_3\text{OCH}_3$
19. **Carbohydrates are macromolecules composed of \_\_\_\_\_ monomers.**  
A) amino acid  
B) monosaccharide  
C) nucleotide  
D) glycerol and fatty acid  
E) phosphate
20. **The two strands of a DNA double helix are held together by**  
A) ionic bond  
B) phosphodiester bond  
C) peptide bond  
D) hydrogen bond  
E) ester bond

**ENGLISH  
ENTRANCE EXAM**

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

**1. Read the text below and decide which word (A, B, C or D) best fits each space.**

Until about 250 years ago, households did not take dirt as **..(1)..** as they do now - it was a fact of life, and that was that. Cleaning often consisted of an annual **..(2)..** called 'spring cleaning' when the furniture was moved aside, and all the linen products in the house were cleaned. Carpets and rugs were taken outside, hung on ropes and had the dust **..(3)..** out of them - an exhausting and messy process.

The industrial revolution brought about a major change - as new **..(4)..** became available to make homes cleaner, a corresponding interest in '**..(5)..** hygiene' appeared in households. This in turn led to the **..(6)..** of further products, one of which was the vacuum cleaner.

**..(7)..** has it that when one of the first vacuum cleaners was demonstrated, a kindly scientist took the proud inventor **..(8)..** , and offered a bit of advice that was to become **..(9)..** to the future evolution of the product - 'make it suck, not blow'.

The first vacuum cleaners appeared in the 1860s in the United States. They were operated by hand pumps and were almost as **..(10)..** as spring cleaning.

- |                   |              |                 |                 |
|-------------------|--------------|-----------------|-----------------|
| 1. a) importantly | b) crucially | c) considerably | d) seriously    |
| 2. a) ritual      | b) result    | c) resolution   | d) scrub        |
| 3. a) cleaned     | b) taken     | c) beaten       | d) sucked       |
| 4. a) products    | b) concepts  | c) ideals       | d) developments |
| 5. a) house       | b) domestic  | c) homely       | d) internal     |
| 6. a) fabrication | b) appearing | c) recreation   | d) development  |
| 7. a) Story       | b) Epic      | c) Legend       | d) Tale         |
| 8. a) away        | b) aside     | c) aback        | d) along        |
| 9. a) standard    | b) crucial   | c) regular      | d) esteemed     |
| 10. a) laborious  | b) hard      | c) nefarious    | d) straining    |

(10 scores)

2. These sentences have been divided into separate halves. Match the half sentences in the first column with the half sentences in the second column.

1.	The patient in shock	<b>A</b>	against diphtheria.
2.	You can obtain most vital amino acids	<b>B</b>	from midnight of the night before an operation.
3.	Vitamins help	<b>C</b>	can cause back pain.
4.	Bad posture	<b>D</b>	to restore strength.
5.	Babies should be inoculated	<b>E</b>	before use.
6.	Surgical instruments must be sterilized	<b>F</b>	should be kept warm and lying down.
7.	AIDS can be transmitted by	<b>G</b>	using non-sterile needles.
8.	A hard bed is good for	<b>H</b>	from your daily diet.
9.	The patient should fast	<b>I</b>	try and stop the flow of blood.
10.	A tourniquet should be used to	<b>J</b>	someone with back problems.

(10 scores)

3. Read the sentences and circle the correct word/definition.

1. Pertussis is the medical name of:

- a. whooping cough
- b. chickenpox
- c. hay fever

2. An oncologist is:

- a. a doctor dealing with pregnant women
- b. a doctor giving medical care for cancer patients
- c. a doctor dealing with problems of the skin

3. If you have problems with your bowels, you turn to:

- a. an otolaryngologist
- b. an enterologist
- c. a cardiologist

4. A gastrectomy is an operation performed on:

- a. the stomach
- b. the voice box
- c. the liver

5. The bronchioles are part of the:

- a. digestive system
- b. respiratory system
- c. lymphatic system

(5 scores)



4. Write an essay of 100-120 words about the structure and function of the digestive system.

SAMPLE 2