

HESI BIOLOGY latest exam version 2021/2022

nursing (Chamberlain University)

1. Which of the following is not true of mitosis?
 - A. Mitosis produces daughter cells
 - B. Mitosis has five main stages
 - C. Mitosis can only be done by haploids**
 - D. Following mitosis, daughter cells are identical to parent cells

2. In meiosis, the chromosome number is reduced from:
 - A. 46 to 23**
 - B. 46 to 33
 - C. 28 to 14
 - D. 24 to 12

3. Cellular respiration takes place in which of the following?
 - A. Golgi apparatus
 - B. Mitochondrion**
 - C. Chloroplast
 - D. Ribosome

4. Which of the following is the term used to represent two alleles that are the same type?
 - A. Homosynchronous
 - B. Hypersynchronous
 - C. Heterozygous
 - D. Homozygous**

The Punnett square shows that one parent carries the recessive gene for a cleft chin (c) while the other parent does not.

5. What percentage of the parents' offspring is predicted to have a cleft chin?

	C	c
C	Cc	Cc
c	cc	cc

- A. 25%
- B. **50%**
- C. 0%
- D. 75%

6. Which of the following options identifies the products of cell respiration?

- A. Water, carbon dioxide, and oxygen
- B. Glucose and oxygen
- C. **Water, carbon dioxide, and adenosine triphosphate (ATP)**
- D. Water, glucose, and oxygen

7. Which stage of mitosis is occurring when the nuclear envelope begins to disappear and the chromosomes begin to attach to the spindle that is forming along the axis of the cell?

- A. Prometaphase
- B. Metaphase
- C. Anaphase

D. Prophase

8. In the hierarchic organizational system, which of these is the most restrictive category?

- A. Genus
- B. Class
- C. Kingdom
- D. **Species**

9. Water is a polar molecule that can be:

- A. cohesive and corrosive
- B. **cohesive and adhesive**
- C. electrostatic and ionic
- D. repellent and attractive

10. What is considered the main objective of the translation stage of protein synthesis?

- A. **To produce amino acids**
- B. To produce nucleotides
- C. To produce fatty acids
- D. To produce nucleic acids

11. Prokaryotic cells lack which of the following?

- A. A cell membrane
- B. Genetic material
- C. Cytoplasm

D. Membrane bound organelles

12. Proteins are polymers of 20 molecules called:

- A. Amino acids**
- B. Phospholipids
- C. Carbohydrates
- D. Fatty acids

13. Which of the following statements is true if a molecule has adhesion?

- A. Two molecules of the same substance have the ability to stay bonded to one another
- B. The molecule has the ability to bond to or attract other molecules**
- B. A molecule has the ability to increase its heat when necessary
- C. The molecule has the ability to form hydrogen bonds

14. Which of the following statements is most accurate regarding the transcription of DNA?

- A. RNA uses reverse transcriptase to make mRNA
- B. DNA uses mRNA to produce tRNA
- C. RNA creates a duplicate copy of DNA
- D. RNA copies DNA to produce mRNA**

15. What are the two types of cells in biology?

- A. Ribosomes and lysosomes
- B. Mitochondria and chloroplasts
- C. Nucleic and protein

D. Prokaryotic and eukaryotic

16. Which two items react during cellular respiration?

- A. Glucose and water
- B. Carbon dioxide and water
- C. Carbon dioxide and oxygen

D. Glucose and oxygen

17. What must first occur before a cell can be divided to grow, develop, and reproduce organisms?

- A. RNA replication
- B. DNA replication**
- C. Gene replication
- D. Chromosome replication

18. Which of the following organelles is known as the cell's transportation center?

- A. Golgi apparatus**
- B. Endoplasmic reticulum
- C. Mitochondria
- D. Lysosomes

19. During photosynthesis in green plants, light energy is captured and used to convert all except which of the following into oxygen and energy-rich organic compounds?

- A. Minerals
- B. Water
- C. Carbon dioxide

D. Metals

20. What is the correct term to describe the amount of heat necessary to raise the temperature of 1 gram of a molecule by one degree Celsius?

- A. Viscosity
- B. Specific gravity
- C. Latent heat
- D. Specific heat**

21. In DNA, the nucleotide base adenine always binds with which of the following?

- A. Guanine
- B. Uracil
- C. Thymine**
- D. Cytosine

22. Which of the following consists of polymers of twenty molecules called amino acids?

- A. Nucleic acids
- B. Proteins**
- C. Carbohydrates
- D. Lipids

23. Which of the following describes the set of metabolic reactions and processes that take place in the cells of organisms to convert biochemical energy from nutrients into adenosine triphosphate (ATP), and then release waste products?

- A. Cellular respiration**

- B. Meiosis
- C. Photosynthesis
- D. Mitosis

24. Which of the following molecules is the most significant contributor to cellular function?

- A. Proteins**
- B. Phospholipids
- C. Carbohydrates
- D. Fatty acids

25. With which of the following does protein synthesis begin?

- A. Transcription**
- B. Cytokinesis
- C. Binary fission
- D. Translation

26. What function does cholesterol, a phospholipid, serve within the cell membrane?

- A. It builds up fats to make the structure more flexible
- B. It allows protein channels to form
- C. It makes the structure very rigid and impermeable
- D. It stabilizes the membrane structure**

27. Which of the following best describes phenotype?

- A. The hereditary potentials and limitations of an individual

- B. The genetic makeup of an individual organism
- C. The entire complex of genes inherited from both parents
- D. All the observable characteristics of an organism**

28. Which of the following correctly identifies the two organelles that produce cell energy?

- A. Ribosomes and lysosomes
- B. Mitochondria and chloroplasts**
- C. Mitochondria and lysosomes
- D. Ribosomes and vacuoles

29. Which stage of mitosis is occurring when the chromosomes gather on either side of the separating cell?

- A. Metaphase
- B. Telophase**
- C. Anaphase
- D. Prophase

30. During which stage of photosynthesis is solar energy converted to chemical energy?

- A. During phosphate synthesis
- B. During light reactions**
- C. During the Krebs cycle
- D. During the Calvin cycle

31. Which of the following options is the term used to represent alternative versions of a gene?

- A. Alleles
- B. Binary fission
- C. Heterozygous
- D. Homozygous

32. What is the process used by most bacteria to perform asexual reproduction?

- A. Meiosis
- B. Mitosis
- C. Binary fission**
- D. Interphase

33. Which of the following is not one of the four nitrogenous bases that make up the DNA structure?

- A. Adenine
- B. Guanine
- C. Uracil**
- D. Thymine

34. Which of the following molecules contains the code that is required for replication?

- A. Deoxyribonucleic acid (DNA)**
- B. Transfer RNA (tRNA)
- C. Messenger RNA (mRNA)
- D. Ribonucleic acid (RNA)

35. In which step of cellular respiration is the most adenosine triphosphate (ATP) created?