

1. An experiment was designed to determine the effect of nitrates on plant growth. Two groups of plants were grown under identical conditions, except one group was watered with a dilute nitrate solution and the other group received water without nitrates. In this investigation, the group of plants grown without added nitrates is known as the

- A. abiotic factor
- B. control
- C. variable
- D. environmental stimulus

2. In a scientific investigation, after the question is defined, the next step is most likely

- A. formulating a hypothesis
- B. identifying needed equipment
- C. designing the experiment
- D. collecting the data

3. A new concept that is tested in a scientific investigation is known as

- A. a theory
- B. the hypothesis
- C. an inference
- D. an observation

4. When viewed from Earth, the light from very distant galaxies shows a red shift. This is evidence that these distant galaxies are

- A. revolving around the Sun
- B. revolving around the Milky Way
- C. moving away from Earth
- D. moving toward Earth

5. Base your answer(s) to the following question(s) on the table below, which shows eight inferred stages describing the formation of the universe from its beginning to the present time.

Data Table

Stage	Description of the Universe	Average Temperature of the Universe ($^{\circ}\text{C}$)	Time From the Beginning of Universe
1	the size of an atom	?	0 second
2	the size of a grapefruit	?	10^{-43} second
3	“hot soup” of electrons	10^{27}	10^{-32} second
4	Cooling allows protons and neutrons to form.	10^{13}	10^{-6} second
5	still too hot to allow the forming of atoms	10^8	3 minutes
6	Electrons combine with protons and neutrons, forming hydrogen and helium atoms. Light emission begins.	10,000	300,000 years
7	Hydrogen and helium form giant clouds (nebulae) that will become galaxies. First stars form.	-200	1 billion years
8	Galaxy clusters form and first stars die. Heavy elements are thrown into space, forming new stars and planets.	-270	13.7 billion years

How soon did protons and neutrons form after the beginning of the universe?

- A. 10^{-43} second B. 10^{-32} second C. 10^{-6} second D. 13.7 billion years

6. Base your answer(s) to the following question(s) on the table below, which shows eight inferred stages describing the formation of the universe from its beginning to the present time.

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According to this table, the average temperature of the universe since stage 3 has

- A. decreased, only B. increased, only
C. remained the same D. increased, then decreased

7. Base your answer(s) to the following question(s) on the table below, which shows eight inferred stages describing the formation of the universe from its beginning to the present time.

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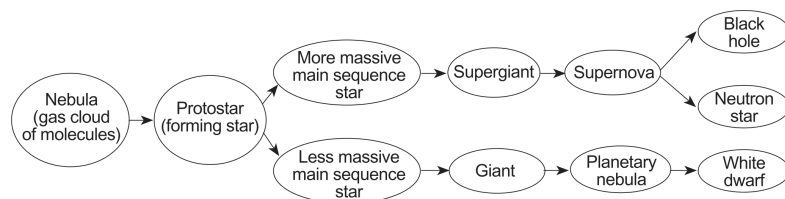
Between which two stages did our solar system form?

- A. 1 and 3 B. 3 and 5 C. 6 and 7 D. 7 and 8

8. Which object forms by the contraction of a large sphere of gases causing the nuclear fusion of lighter elements into heavier elements?

- A. comet
B. planet
C. star
D. moon

9. Base your answer(s) to the following question(s) on the flowchart below and on your knowledge of Earth science. The flowchart shows the evolution of stars.



Identify the force responsible for the contraction of a nebula (a gas cloud of molecules) to form a protostar.

10. Organic compounds in which molecules are made up of building blocks containing amino groups are classified as

- A. proteins
- B. carbohydrates
- C. lipids
- D. fatty acids

11. What is one possible function of nucleic acids?

- A. Structural component of cell walls
- B. Structural component of cell membranes
- C. Protein synthesis
- D. none of the above

12. In living organisms, lipids function mainly as

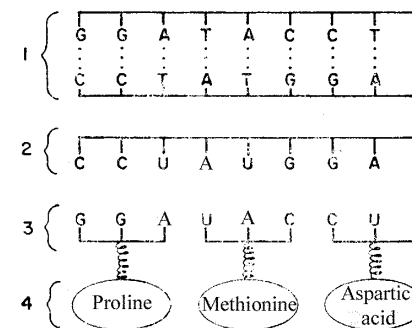
- A. sources of stored energy and transmitters of genetic information
- B. sources of stored energy and components of cellular membranes
- C. transmitters of genetic information and catalysts of chemical reactions
- D. catalysts of chemical reactions and components of cellular membranes

13. A DNA molecule with the base sequence A-G-C-T-C-A was used as a template for the synthesis of a messenger RNA molecule. Which base sequence correctly represents the corresponding portion of this RNA molecule?

- A. T-C-A-G-C-A
- B. U-C-G-A-G-U
- C. A-G-C-U-C-A
- D. A-T-G-A-C-T

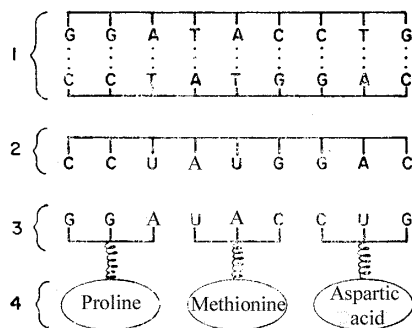
14. A portion of a DNA molecule is represented by

- A. 1
- B. 2
- C. 3
- D. 4



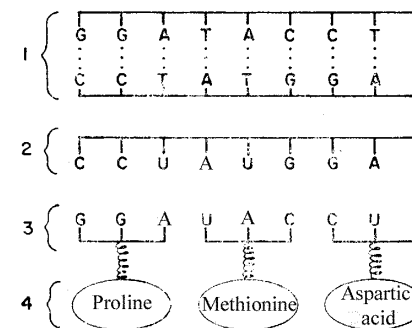
15. A portion of a messenger RNA molecule is represented by

- A. 1
- B. 2
- C. 3
- D. 4



16. The messenger RNA codon for methionin is

- A. TAC
- B. UAC
- C. ATG
- D. AUG



17. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Carries instructions from the nucleus to the cytoplasm

- A. DNA, only
- B. Messenger RNA, only
- C. Transfer RNA, only
- D. DNA, messenger RNA, and transfer RNA

18. Select the nucleic acid molecules, *chosen from the list below*, that is best described by the statement shown.

Contains thymine

- A. DNA, only
- B. Messenger RNA, only
- C. Transfer RNA, only
- D. DNA, messenger RNA, and transfer RNA

19. Which process requires the expenditure of cellular energy?

- A. passive transport
- B. active transport
- C. osmosis
- D. diffusion

20. The building blocks of both DNA and RNA molecules are known as

- A. amino acids
- B. nucleotides
- C. hydrocarbons
- D. polysaccharides

21. A student prepared three different red blood cell suspensions as follows:

Suspension	Contents
<i>A</i>	red blood cells + normal blood serum
<i>B</i>	red blood cells + 10% salt solution
<i>C</i>	red blood cells + distilled water

Which suspension, when viewed under the microscope, would contain red blood cells that appear wrinkled and reduced in volume?

- A. *A*
- B. *B*
- C. *C*

22. A student prepared three different red blood cell suspensions as follows:

Suspension	Contents
<i>A</i>	red blood cells + normal blood serum
<i>B</i>	red blood cells + 10% salt solution
<i>C</i>	red blood cells + distilled water

Which suspension, when viewed under the microscope, would contain red blood cells that had swollen and burst apart?

- A. *A*
- B. *B*
- C. *C*

23. A student prepared three different red blood cell suspensions as follows:

Suspension	Contents
<i>A</i>	red blood cells + normal blood serum
<i>B</i>	red blood cells + 10% salt solution
<i>C</i>	red blood cells + distilled water

Which suspension represents the control in this investigation?

- A. *A*
- B. *B*
- C. *C*

24. Which organelles are usually found in both plant and animal cells?

- A. cell walls
- B. centrioles
- C. mitochondria
- D. chloroplasts

25. A sample of matter is obtained from very deep in the ocean. On what basis would a scientist most likely determine that the sample originated from living tissue?

- A. the detection of DNA and enzymes in the sample
- B. a change in the color of the sample when exposed to air
- C. a change in the temperature of the sample
- D. the release of gases from the sample

26. What is the site of protein synthesis in plant cells?

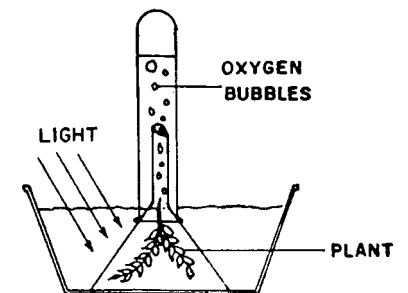
- A. nuclei
- B. chromosomes
- C. vacuoles
- D. ribosomes

27. Which molecules must be present in order for energy production to occur in the mitochondria of an animal cell?

- A. chlorophyll molecules
- B. carbon dioxide molecules
- C. lactic acid molecules
- D. oxygen molecules

28. In the diagram shown, the plant was exposed to several different colors of light. If all the light intensities were the same, under which color of light would oxygen be produced at the *lowest* rate?

- A. red
- B. blue
- C. green
- D. white

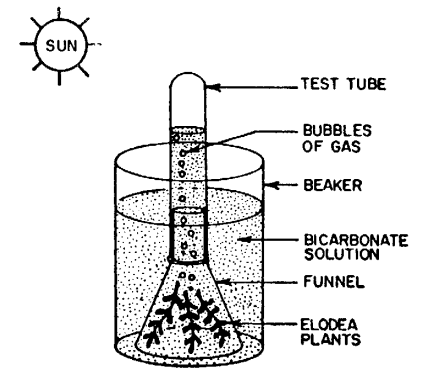


29. When does aerobic respiration occur in green plants?

- A. during daylight, only
- B. during darkness, only
- C. during both daylight and darkness
- D. only when photosynthesis is occurring

30. During the investigation, which gas is collected in the test tube in the greatest quantity?

- A. ammonia
- B. sulfur dioxide
- C. oxygen
- D. carbon dioxide



Semester 1 Practice Test 12/11/2015

- | | | | |
|---------|--------------------------------------|---------|---|
| 1. | | 21. | |
| Answer: | B | Answer: | B |
| 2. | | 22. | |
| Answer: | A | Answer: | C |
| 3. | | 23. | |
| Answer: | B | Answer: | A |
| 4. | | 24. | |
| Answer: | C | Answer: | C |
| 5. | | 25. | |
| Answer: | C | Answer: | A |
| 6. | | 26. | |
| Answer: | A | Answer: | D |
| 7. | | 27. | |
| Answer: | D | Answer: | D |
| 8. | | 28. | |
| Answer: | C | Answer: | C |
| 9. | | 29. | |
| Answer: | gravity and gravitational attraction | Answer: | C |
| 10. | | 30. | |
| Answer: | A | Answer: | C |
| 11. | | | |
| Answer: | C | | |
| 12. | | | |
| Answer: | B | | |
| 13. | | | |
| Answer: | B | | |
| 14. | | | |
| Answer: | A | | |
| 15. | | | |
| Answer: | B | | |
| 16. | | | |
| Answer: | D | | |
| 17. | | | |
| Answer: | B | | |
| 18. | | | |
| Answer: | A | | |
| 19. | | | |
| Answer: | B | | |
| 20. | | | |
| Answer: | B | | |