Unit 18 · Life and Its Origin

WORKSHEET

Full marks 35

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 35

1 Key words [4]

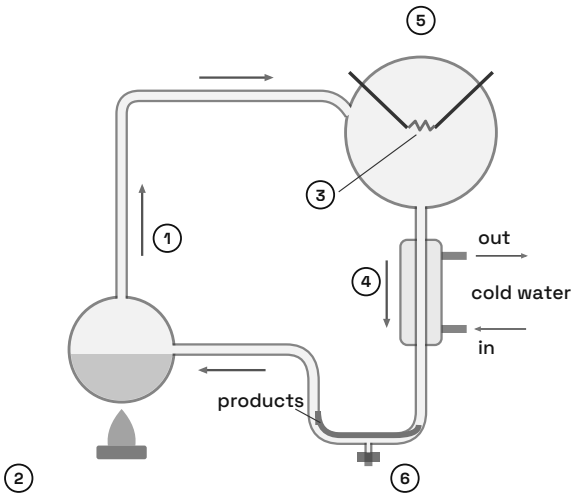
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

abiogenesis	chemogeny	coacervates	eobionts	metaphyta	nebula	oxidizing	panspermia	reducing	stromatolites

The Sun, the Earth and the other planets formed from a turning cloud of gas and dust, the solar _____. The primitive atmosphere had no free oxygen; an atmosphere like this is called _____. The idea that life reached the Earth from space on meteorites is the cosmozoic theory, or _____. The belief that living things arise again and again from non-living matter is spontaneous generation, or _____. The making of complex organic molecules from simple inorganic ones, in the first stage of the Oparin–Haldane theory, is _____. Oparin called the tiny droplets of large molecules that took in substances, grew and split _____. The first cells, which came from such droplets, are called protobionts or _____. Layered rocks built by mats of microbes, among the oldest signs of life, are _____.

2 Label the diagram [3]

The diagram shows the apparatus of the Miller–Urey experiment. Write the names of the parts 1 to 6. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. Which elements formed the Earth's core, according to the dust-cloud (nebular) hypothesis? [1]

a. aluminium, silicon, phosphorus and sulphur
b. iron and nickel
c. helium, hydrogen, oxygen and nitrogen
d. carbon, silicon, oxygen and sulphur

ii. According to the theory of biogenesis, where did life come from? [1]

a. a supernatural power
b. non-living matter
c. pre-existing life
d. another planet

iii. In which stage of the origin of life did nucleic acids like DNA and RNA first form? [1]

a. chemogeny
b. biogeny
c. cognogeny
d. photosynthesis

iv. Which group of organisms first filled the air with oxygen? [1]

a. the first anaerobic heterotrophs
b. sulphur bacteria
c. cyanobacteria
d. the first land plants

v. In Pasteur's experiment, why did the broth in the unbroken swan-neck flask stay free of microbes, although its neck was open to the air? [1]

a. the boiled broth could no longer feed microbes
b. the glass neck killed microbes in the air
c. dust carrying microbes settled in the bend of the neck and never reached the broth
d. there was no air inside the flask

4 Very short answers [3]

Write very short answers to the following questions.

a. How old is the Earth, according to scientists? [1]

b. Name two amino acids found in the trap of the Miller–Urey experiment. [1]

c. Why can't life arise from non-living matter on the Earth today, as the Oparin–Haldane theory says it once did? [1]

5 Short answers [9]

Write short answers to the following questions.

a. What does the theory of special creation propose about the origin of living things? [2]

b. Write two ways in which the primitive atmosphere differed from today's, and one reason for each difference. [2]

c. A book gives this equation as an example of chemosynthesis: $6CO_2 + 12H_2S \rightarrow C_6H_{12}O_6 + 6H_2O + 12S$. Is it right? Give a reason. [2]

d. Describe Redi's experiment with meat and say what it showed. [3]

6 Long answers [8]

Write long answers to the following questions.

a. Describe chemogeny, the first stage of the Oparin–Haldane theory, and name the sources of energy for it. [4]

b. Describe the theory of spontaneous generation (abiogenesis), and give an example of an experiment that disproved it. [4]

7 Think [3]

The Miller–Urey experiment made amino acids from simple gases. Does it prove how life began? Give your argument.

8 Activity: Redi's jars at home

(not marked)

Put a small piece of meat or fish (or a slice of ripe fruit) in each of three jars: leave one open, cover one with fine cloth tied tight, and close one with its lid. Keep them outside, away from people, for a week, then fill in the table. Throw everything away carefully afterwards and wash your hands.

Jar	Flies on it?	Maggots or eggs, and where?
open		
covered with cloth		
closed with a lid		

What does the jar covered with cloth show that the closed jar can't?