Unit 11 · Monera

WORKSHEET

Full marks 39

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 39

1 Key words [4]

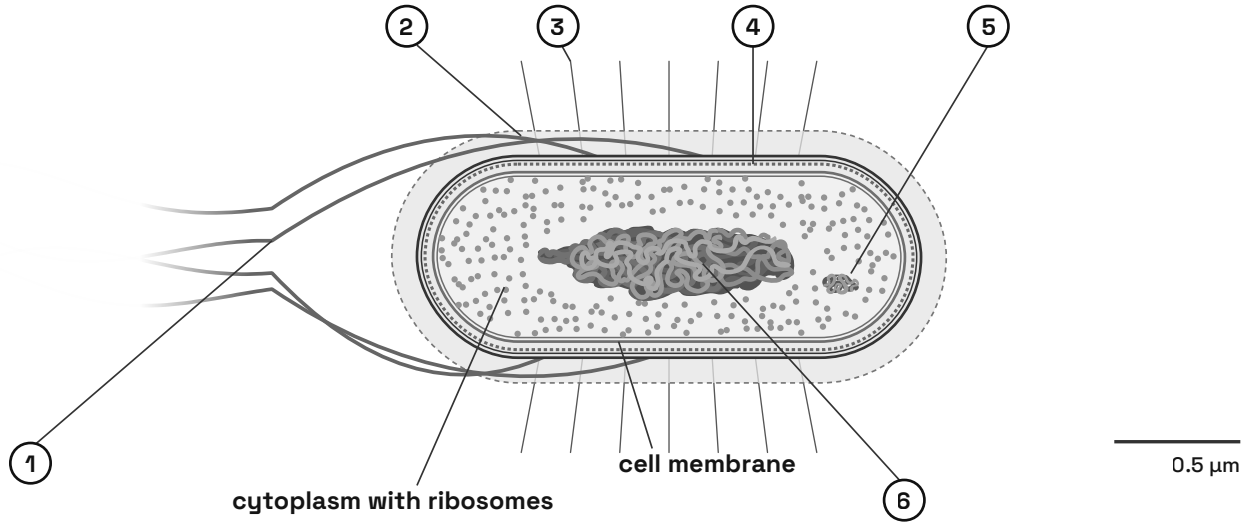
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

anoxygenic	**chemosynthesis**	**heterocysts**	**histones**	**hormogonia**	**mesosome**	**nucleoid**
peptidoglycan	**plasmids**	**pleomorphism**				

The bacterial cell wall is made of _____. The single circular DNA of a bacterium, with no membrane round it, is the _____, and small extra rings of DNA are _____. Bacteria that change their shape when conditions change show _____. Photosynthesis in which no oxygen is given off, as in purple sulphur bacteria, is _____. Bacteria that make food using energy from oxidizing ammonia carry out _____. In *Nostoc*, nitrogen is fixed in large, pale cells called _____. Pieces of a cyanobacterial filament that break off to grow into new ones are _____.

2 Label the diagram [3]

The diagram shows a bacterial cell. 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. Name the site of respiration in bacteria. [1]

a. mitochondria **b.** chromatophore
c. cell membrane **d.** mesosome

ii. Which one of the following is absent in bacteria? [1]

a. cell wall **b.** nucleoid
c. ribosome **d.** Golgi bodies

iii. Under the microscope, a sample shows round cells in long, bead-like chains. What are they? [1]

a. staphylococci **b.** streptococci
c. sarcina **d.** streptobacilli

iv. A bacterium living in the mud of a dark ditch takes in carbon dioxide and makes sugar, getting its energy by oxidizing ammonia. How does it feed? [1]

a. it is photoautotrophic **b.** it is chemoautotrophic
c. it is saprophytic **d.** it is parasitic

v. Agricultural scientists want to improve crop yield and soil health by introducing nitrogen-fixing bacteria into the soil. Which crop would be the most suitable, considering its ability to form nodules with nitrogen-fixing bacteria? [1]

a. cotton **b.** gram
c. wheat **d.** mustard

4 Very short answers [3]

Write very short answers to the following questions.

a. Who first saw bacteria, and in which year? [1]

b. Name the shape of the bacterium that causes cholera. [1]

c. Why do pickles in salt or sugar keep for months? [1]

5 Short answers [9]

Write short answers to the following questions.

a. What do you mean by naked DNA? [2]

b. How does the photosynthesis of green sulphur bacteria differ from that of green plants? **[2]**

c. Bodies of animals stay preserved in ice for thousands of years. Explain why, and give one way people in Nepal keep food from rotting on the same principle. **[2]**

d. Describe three features of cyanobacteria that show they are bacteria, not plants. **[3]**

6 Numerical problems **[4]**

Solve the following problem. Show your working.

In warm broth, *E. coli* divides every 20 minutes. A plate of rice with 100 bacteria on it is left out on a summer day. i. How many generations pass in 4 hours? ii. How many bacteria are there after 4 hours? iii. How long would it take for the number to reach $100 \times 2^{18} \approx 26$ million? iv. Name the phase of the growth curve this doubling belongs to, and why it can't go on for ever.

Answer:

7 Long answers **[8]**

Write long answers to the following questions.

a. Describe the four phases of the bacterial growth curve. **[4]**

b. A farmer near Chitwan wants to keep his fields fertile without buying much fertilizer. Using what you know about bacteria and cyanobacteria, suggest what he could grow and do, and explain how each works. **[4]**

8 Think **[3]**

Earth's air had almost no oxygen for half its history, and every green leaf has chloroplasts. Explain how cyanobacteria are linked to both facts, and give one piece of evidence for the second.

9 Activity: Observe the bacteria in curd

(not marked)

Put a pinhead of fresh curd on a clean slide, mix it with a drop of water into a thin film, and lower a cover slip over it from one edge. If your laboratory has it, dry the film, fix it by passing it quickly through a flame, and stain it with methylene blue for a minute before rinsing. Look at the highest power.

What you looked for	What you saw
shape of the cells	
how they are arranged	
about how many in one field	
the two kinds you can tell apart	

What do these bacteria do to the milk that turns it into curd?