Unit 16 · Development of the Frog

WORKSHEET

Full marks 31.5

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 31.5

1 Key words [4]

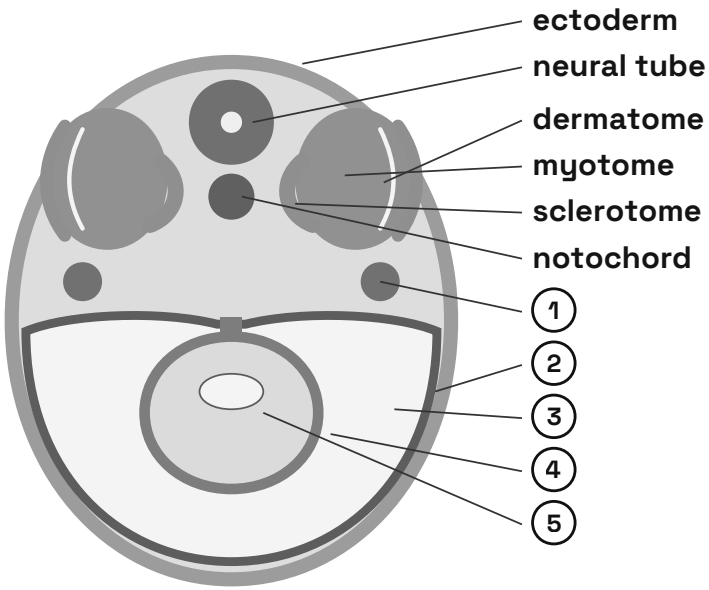
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

amplexus	**archenteron**	**cone of reception**	**enterocoel**	**epiboly**	**fertilization membrane**
holoblastic	**megameres**	**meroblastic**	**schizocoel**		

In the breeding season the male frog clasps the female in an embrace called _____. Where the sperm touches the egg, the egg's surface rises as the _____. Once one sperm is in, the _____ keeps out the others. A frog's cleavage furrows cut right through the egg, so its cleavage is _____. In the 8-celled stage the small upper cells are micromeres and the large yolky lower cells are _____. During gastrulation the micromeres spread down over the whole embryo; this is _____. The new cavity that becomes the gut is the _____. A coelom formed by the splitting of the mesoderm is a _____.

2 Label the diagram [2.5]

The diagram shows the mesoderm in a frog embryo, cut across. Write the names of the parts 1 to 5. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. What is the major event of epiboly in the frog's gastrulation? [1]

a. Mesodermal cells move inwards to form the archenteron.

b. Ectodermal cells spread to cover the entire surface of the embryo.

c. Cells of the endoderm involute to form the yolk plug.

d. The dorsal lip of the blastopore forms.

ii. What stops a second sperm from entering a frog's egg? [1]

a. the jelly hardens round the egg

b. the vitelline membrane lifts off and becomes the fertilization membrane

c. the second polar body blocks the way

d. the egg turns its animal pole down

iii. Why are the megameres of a frog's 8-celled embryo larger than its micromeres? [1]

a. they divide faster

b. the third furrow forms above the equator, because the yolk in the vegetal half pushes the spindles up

c. they take in food from the jelly

d. they come from the sperm

iv. A frog embryo is exposed to a chemical that blocks the signaling molecules involved in forming mesoderm. What effect would this most likely have on coelom formation? [1]

a. The embryo would form an ectodermal coelom instead of a mesodermal one.

b. The mesoderm would fail to develop, and the embryo would have no coelom.

c. The coelom would form normally, but the mesoderm would remain undifferentiated.

d. The embryo would form an enlarged coelom with defects in its organs.

v. Which part of a somite forms the vertebrae? [1]

a. the dermatome **b.** the myotome

c. the sclerotome **d.** the nephrotome

4 Short answers [9]

Write short answers to the following questions.

a. What is cleavage? Why doesn't the embryo grow during it? [2]

b. Write any two significances of fertilization. [2]

c. In Spemann and Mangold's experiment, the dorsal lip of the blastopore of one newt gastrula was grafted into the ventral side of another. What happened, and what did it show? **[2]**

d. Describe the blastula of a frog. What is the importance of its blastocoel? **[3]**

5 Long answers **[8]**

Write long answers to the following questions.

a. What is gastrulation? Describe its main events in a frog. **[4]**

b. Which germ layer forms the nervous system? Describe how the neural tube forms. **[4]**

6 Think [3]

Before fertilization a frog's egg is radially symmetrical; a tadpole has a head and tail, a back and belly, a left and right. Explain how fertilization and the first cleavage already mark these on the egg.

7 Activity: Frog eggs to tadpoles (not marked)

In the rainy season, put a few fertilized frog eggs in a jar of pond water (return them to the pond afterwards). Look at them with a hand lens every morning.

Day	What the eggs or embryos look like
1	
2	
3	
when they hatch	

Why are the cells near the top of each egg smaller than those near the bottom?