Unit 12 · Sexual Reproduction

WORKSHEET

Full marks 32

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 32

1 Key words [4]

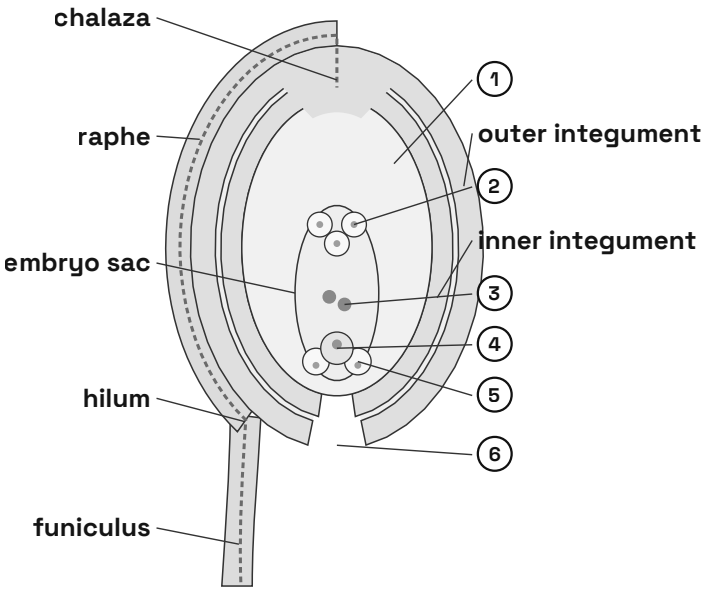
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

anemophily	egg apparatus	exine	geitonogamy	perisperm	porogamy	scutellum	sporopollenin	tapetum	triple fusion

The innermost layer of the anther wall, which nourishes the developing pollen, is the _____. The tough outer wall of a pollen grain is made of _____. The egg and the two synergids together make the _____. Pollen carried to another flower on the same plant is _____. Pollination by wind is _____. Entry of the pollen tube into the ovule through the micropyle is _____. The fusion of the second male gamete with the two polar nuclei is _____. The single shield-shaped cotyledon of a maize embryo is the _____.

2 Label the diagram [3]

The diagram shows an anatropous ovule with its mature embryo sac. 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 nucleus is formed by triple fusion? [1]

a. the zygote, 2n
b. the primary endosperm nucleus, 3n
c. the secondary nucleus, 2n
d. the tube nucleus, n

ii. In a two-celled pollen grain, which cell divides to make the two male gametes? [1]

a. the vegetative (tube) cell
b. the generative cell
c. the microspore mother cell
d. a tapetum cell

iii. A gardener puts paper bags over the flower heads of one maize plant, and shakes its tassel over the silks of the same plant. Which kind of pollination is this? [1]

a. autogamy
b. geitonogamy
c. xenogamy
d. cleistogamy

iv. A flower opens at night, is large, pale and strong-smelling, hangs on a long stalk outside the leaves, and has a lot of nectar. Which pollinator is it most likely adapted to? [1]

a. bees
b. sunbirds
c. bats
d. wind

v. A plant has a mutation that makes its tapetum break down early. What would you expect? [1]

a. the anther would never open
b. the pollen would develop poorly, so the plant would be male-sterile
c. the ovules would not form
d. more pollen would be produced

4 Short answers [9]

Write short answers to the following questions.

a. Write the four layers of the wall of a pollen sac, from outside in, with one function of the innermost. [2]

b. Write any four features of wind-pollinated flowers. [2]

c. A grower wants to keep a fine tomato variety pure, while a breeder wants new varieties of maize. Which kind of pollination suits each, and why? **[2]**

d. Describe how a functional megaspore develops into a mature embryo sac. **[3]**

5 Numerical problem **[4]**

Show your working.

A flowering plant has $2n = 24$ chromosomes in its leaf cells. How many chromosomes are in its microspore mother cell, a microspore, the generative cell, a synergid, an antipodal cell, the zygote, the primary endosperm nucleus and a cell of its endosperm?

Answer:

6 Long answer **[4]**

Write a long answer to the following question.

What is double fertilization? Describe its steps.

7 Think [3]

A ripe pea seed has no endosperm, but a ripe maize grain is mostly endosperm. Both had double fertilization. Explain the difference, and say where each seedling gets its food when it germinates.

8 Activity: Taking a flower apart (not marked)

Collect a flower of mustard (tori), datura, hibiscus or pea. Count its parts, then cut it in half lengthwise with a blade (carefully) and look at the ovary with a hand lens.

Whorl	Parts and number	Male, female or accessory
calyx		
corolla		
androecium		
gynoecium		

What did you see inside the ovary, and what will each become after fertilization?