1

During an experiment to clarify the relationship between the amount of water which be absorbed by a plant from the soil and that is lost during transpiration process in different times during the day, the results are shown as in the table.

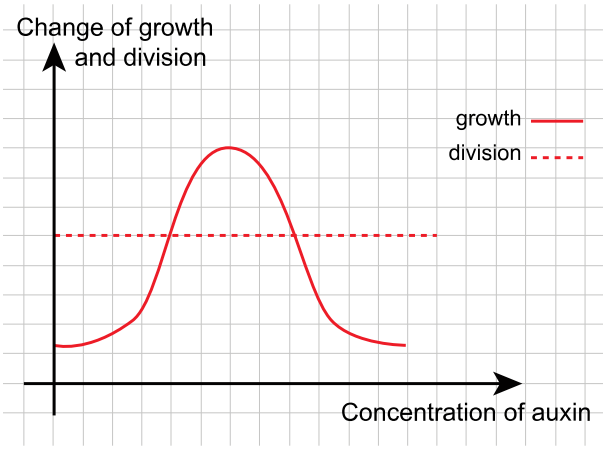
Time	The absorbed water	The lost water
The beginning of the experiment	25 cm^3	25 cm^3
After 3 hours	25 cm^3	40 cm^3
After 9 hours	25 cm^3	35 cm^3
After 12 hours	25 cm^3	20 cm^3

Explain the reason of the changes that happened during the experiment.

- **The plant regains its physiological support after 12 hours from the beginning of the experiment.**
- **The plant is exposed to permanent wilting after 9 hours from the beginning of the experiment.**
- **The physiological support isn't affected during the experiment.**
- **Change was occurred in the structural support.**

2

The following graph represents the results of studying a scientist for the effect of increasing the concentration of auxins on the plant cells.

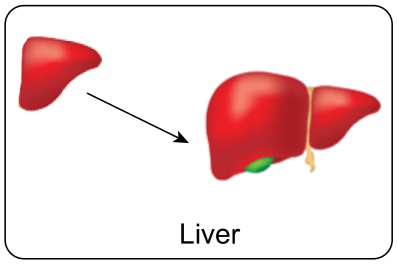


What could be deduced from studying the graph?

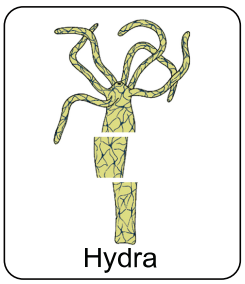
- **The increasing in auxins concentration leads to increasing in cells growth to a certain limit.**
- **Auxins have no effect on the growth of cells.**
- **Increasing in auxins concentration leads to continuous growth of cells.**
- **The rate of cell division decreases by decreasing in auxins concentration.**

3

Notice the picture, then determine:



(1)



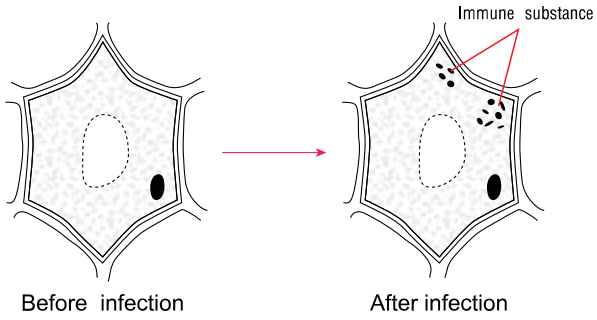
(2)

What is the difference in division between figure (1) and figure (2)?

- **Purpose of the division.**
- **Type of the division.**
- **Number of resulted cells.**
- **Number of chromosomes in resulted cells.**

4

Study the figure in front of you that respresents plant cell before and after infection, then conclude:.



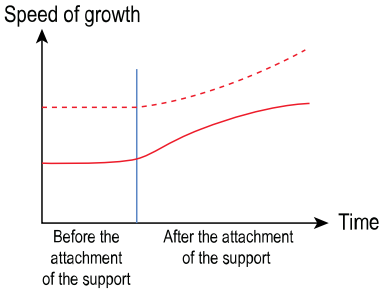
What is the immune mechanism that occurred inside the cell?

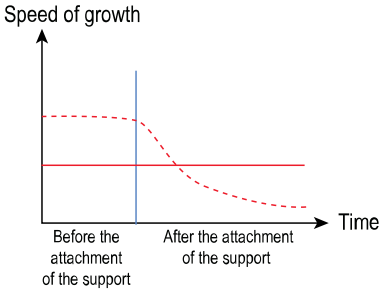
- **Anti microbial proteins.**
- **receptors.**
- **Cephalosporin.**
- **Canavinine.**

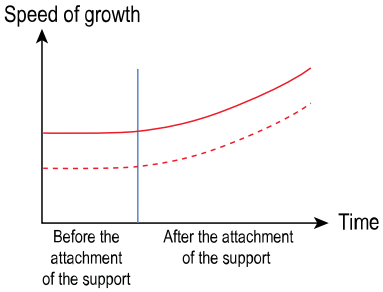
5

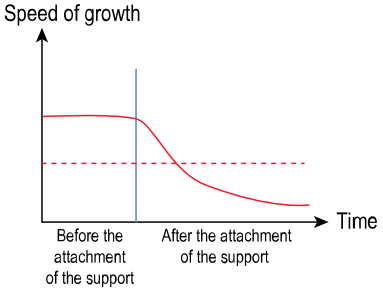
Study the graphs, that represent the growth of the two sides of tendrils if (_____) represents the side that is in contact to the support and (------) represents the side that is away from the support, then determine.

Which of following graphs represents the growth of both sides of the tendril if it attached an external support?

- 

- 

- 

- 

6

The table in front of you shows the response of 4 parts of endocrine glands for hormones of pituitary gland in the human body.

The part of the gland	The response
1	×
2	✓
3	✓
4	✓

(✓) **Responding**

(×) **Non - responding**

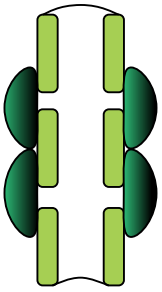
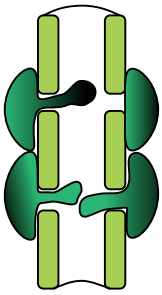
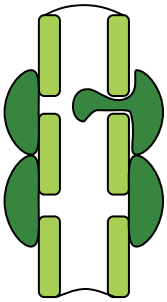
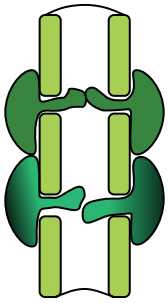
What does number (1) refer to?

- **Medulla of adrenal gland.**
- **Cortex of adrenal gland.**
- **Thyroid gland.**
- **The ovary.**

7

Four plants of the same species are exposed to a deep wound at the same time.

Which of the following figures refers to the plant cells that have no receptors?

- 
- 
- 
- 

8

The opposite figure represents a planaria worm which has been cut into 8 pieces as in figure, then it is placed in salty water.

How many planaria worms that are expected to be produced by regeneration?

- **Zero**
- **2**
- **4**
- **8**

9

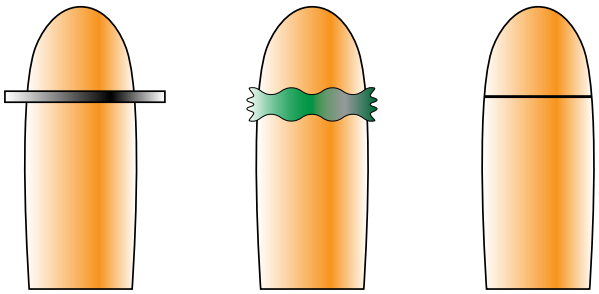
In one experiment on avena plant , the plants had been divided into 3 groups as shown in figure.

1st group the growing tip is separated from the plants by a metallic sheet.

2nd group the growing tip is separated from the plants by a gelatinous substance.

3rd group the growing tip is separated then re-joined directly.

After few days it is noticed that only the growth of the 1st group plants has stopped while the plants of the two other groups continued in growing.

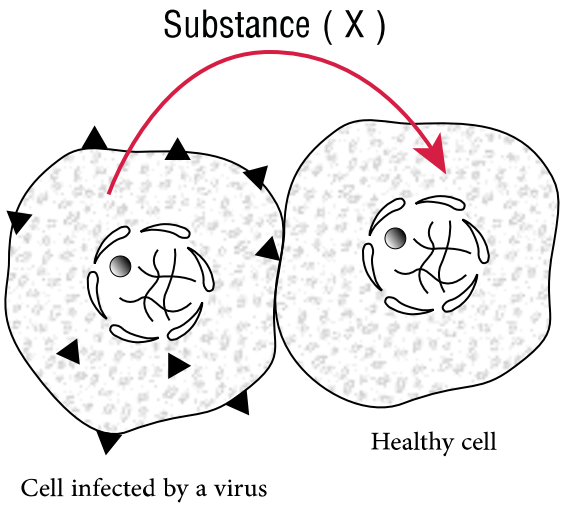


What is your explanation for these results?

- **The direct attachment between the growing tip and the plant is not necessary for the passage of auxins.**
- **The stopping of the growth in 1st group returns to the loss of the growing tip to its ability for secreting auxins.**
- **The continuity of the growth in the 2nd and the 3rd groups proves that auxins have no role in growth.**
- **The presence of direct attachment between the growing tip and the plant is necessary for growth.**

10

Study the figure, then answer:



What is the substances X?

- **Interferons.**
- **Chemokines.**
- **Interleukins.**
- **Histamine.**

11

Study the table in front of you that illustrates the quantity of energy (ATP) which is required for the normal contraction of four different muscles.

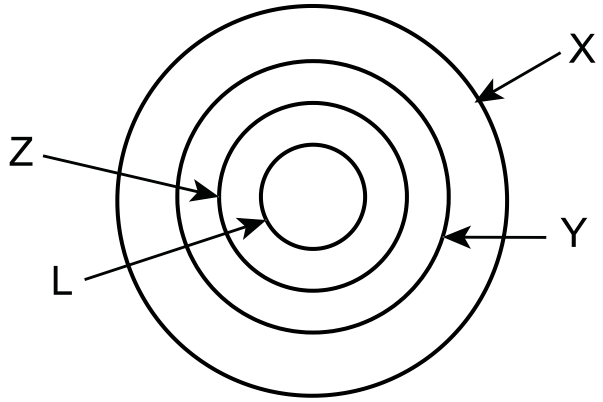
Muscle	Energy (ATP)
1	380
2	3800
3	2000
4	680

What is the muscle that contains the largest number of motor units?

- **2**
- **1**
- **3**
- **4**

12

Study the diagram that represents the floral whorls of a complete matured flower arranged from outside to inside, then determine.

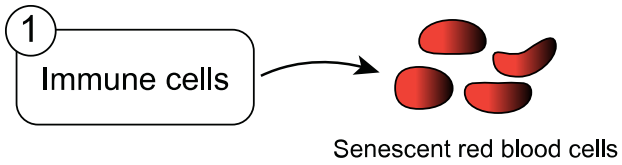


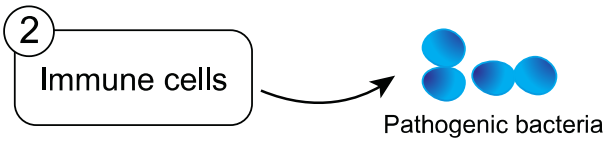
What is the reason that helps in occurrence of self-pollination in this flower?

- **Maturity of both of (L) and (Z) at the same time.**
- **Y attracts insects.**
- **Maturity of (L) before (Z).**
- **X protects the inner parts.**

13

Study the following diagram then determine.

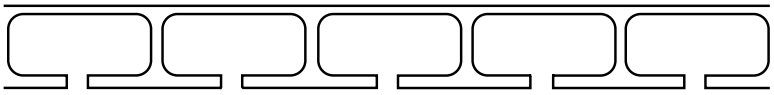




What is the type of immune cells (1) and (2) respectively?

- **Macrophages and granulated cells.**
- **Monocyte and cytotaxic T. cells (TC).**
- **Naturel killer (NK) and helper T. cells (TH).**
- **Helper T. cells (TH) and naturel killer (NK).**

14

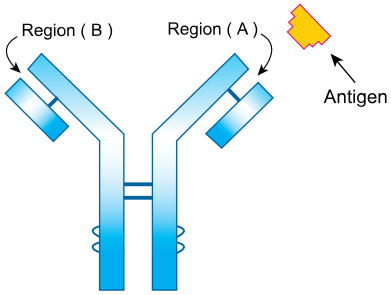
The opposite figure illustrates a filament of spirogyra alga that is isolated from a dry pond, study it then determine. 

What is the form of reproduction in this filament?

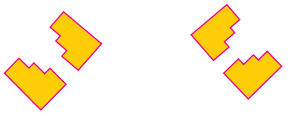
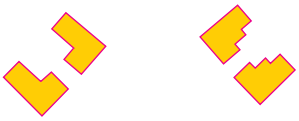
- **Sexual reproduction by scalariform conjugation.**
- **Sexual reproduction by lateral conjugation.**
- **Asexual reproduction by mitosis.**
- **The type of reproduction can’t be identified.**

15

Study the figure which illustrates one of immune system components.



Which figure describes the regions A and B?

- 
- 
- 
- 

16

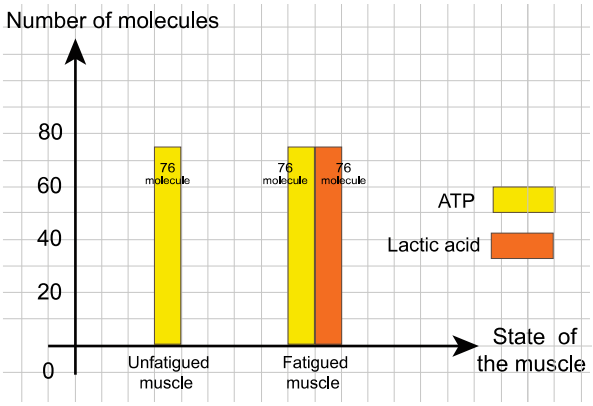
What is the period that is needed by plasmodium malaria parasite for repeating the appearance of the symptoms 5 successive times on a patient?

- **10 days.**
- **5 days.**
- **2 weeks.**
- **1 month.**

17

In aerobic respiration of the skeletal muscle , the amount of energy produced from one glucose molecule equals 38 ATP ,while one glucose molecule can produce (2 ATP) molecules during anaerobic respiration and two molecules of lactic acid.

The following graph represents the amount of ATP and lactic acid that are produced during the activity of a skeletal muscle.



What is the ratio between the amount of glucose that is consumed during normal activity and that is consumed during its fatigue respectively?

- **1 : 19**
- **19 : 1**
- **1 : 1**
- **1 : 2**

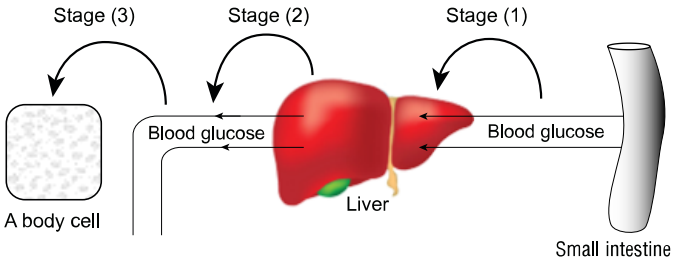
18

What is the difference between the steps of formation of each of pollen grains and ovules in flowering plants?

- **Number of occurrences of mitotic division.**
- **Number of occurrences of meiotic division.**
- **Number of resulted cells from meiotic division.**
- **The order of occurrences each of meiosis and mitosis.**

19

The following figure represents the role of two hormones that are secreted from the same gland.



Which of the following is considered the correct effect of the two hormones?

- **The decrease of the hormone in stage (1) decreases the glycogen percentage in liver.**
- **The increase of the hormone in stage (1) decreases the glycogen percentage in liver.**
- **The increase of the hormone in stage (2) decreases the glucose sugar in blood.**
- **The decrease of the hormone in stage (3) increases the glucose sugar in cells.**

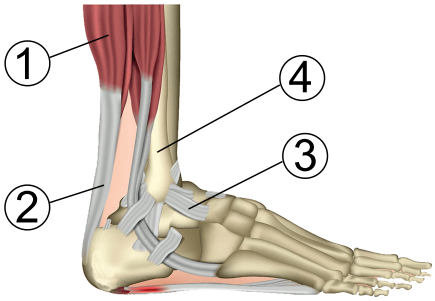
20

Which of the following describe the eggplant fruit?

- **True fruit.**
- **False fruit.**
- **Single seeded fruit.**
- **Seedless fruit.**

21

The figure in front of you illustrates a joint of a human body.



What is the structure that is responsible for determine the direction of the movement in this joint?

- **(3)**
- **(1)**
- **(2)**
- **(4)**

22

“A person carried out a medical analysis for the percentage of TSH in the blood and the result of the analysis was as shown. if this person not suffer from any problem in pituitary gland”

Result	normal range
10.5	0.5 up to 1.5

What could this person suffer from?

- **Myxodema.**
- **Exophthalmic goiter.**
- **Increase iodine in his body.**
- **Increase the secretion of calcitonin.**

23

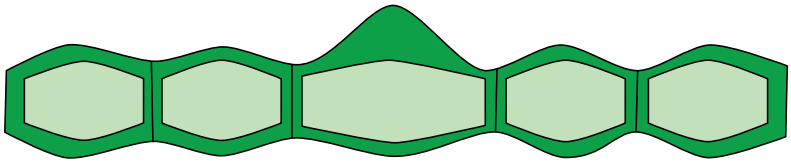
Notice the image then determine.

What does characterize this stage of embryonic developing?

- **Growth of embryo decreases.**
- **Growth of ear is completed.**
- **Possibility of differentiate the male embryo only.**
- **The start of heart formation.**

24

The figure in front of you illustrates a part of epidermis of plant stem.

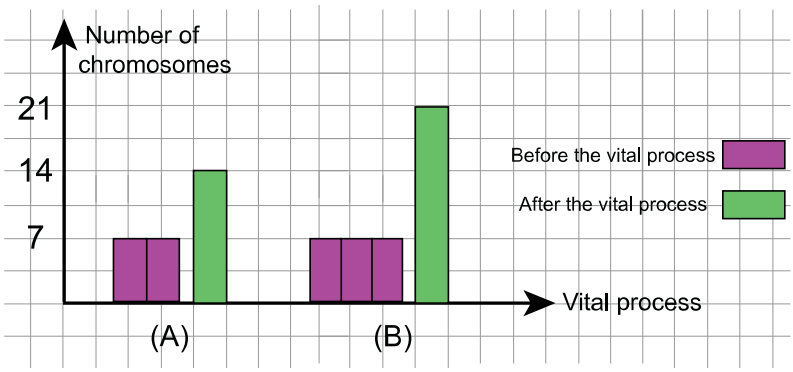


What is the type of immune response that is shown in figure?

- **Post infection structural.**
- **Pre. existing structural.**
- **Pre. existing biochemical.**
- **Post infection biochemical.**

25

Study the graph that illustrates one of the vital processes that occur inside the ovules of pea plant which its somatic cells contain 14 chromosomes, then conclude.

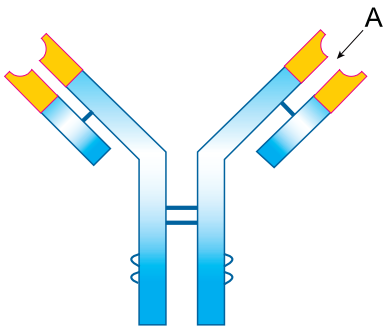


What is the process that is expressed by (A) and (B) together?

- **Double fertilization.**
- **Triple fusion.**
- **Formation of embryonic sac.**
- **Formation of the fruit.**

26

The figure in front of you illustrates the structure of one of the components of immune system.



What is the result of replacing one amino acid by another in the area (A)?

- **It becomes unsuitable for its antigen.**
- **It can bind to its antigen.**
- **It remains without any change.**
- **Occurrence of change in the antigens.**

27

What is the reason of lowering the rate of fertility in a 25 years old female?

- **Decrease the secretion of FSH.**
- **Increase the secretion of LH.**
- **Increase the secretion of estrogen hormone.**
- **Decrease the secretion of progesterone hormone.**

28

The law of “all or none “is controlling the contraction of muscles, which means that the muscle can’t contract unless the stimulus is strong enough to stimulate the muscle to contract with the maximum strength.

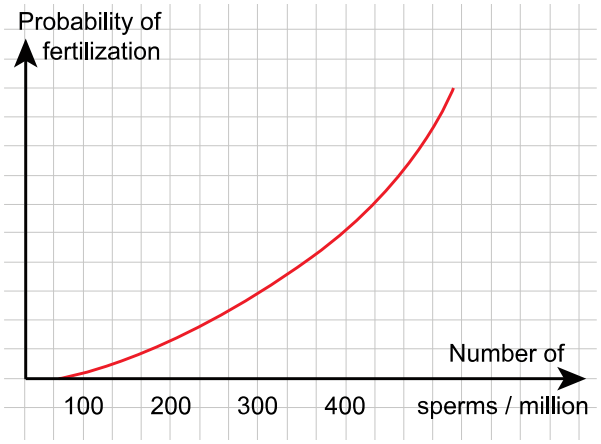
If two identical muscles have been exposed to two stimuli which are strong enough to stimulate both of them but the first stimulus was double strength the second stimulus.

What is the expected result of this case?

- **Both of the two muscles will contract with the same degree.**
- **The contraction of the 1^{st} muscle will be double the 2^{nd}.**
- **The contraction of the 2^{nd} muscle will be double the 1^{st}.**
- **The 1^{st} muscle contract but the 2^{nd} muscle doesn’t.**

29

The following graph represents the relationship between the number of sperms and the probability of fertilization of a human ovum.



Which of the following can be concluded from this graph?

- **By increasing the number of sperms, the amount of hyalurinase enzyme increases.**
- **By increasing the number of sperms to a certain limit, probability of fertilization decreases.**
- **For occurrence of infertility, the number of sperms must reach to zero.**
- **There is no relationship between the number of sperms and the probability of fertilization.**

30

Study the picture then answer.

Which of the following describes the twins in this figure?

- **May have the same sex.**
- **Always have the same sex.**
- **Always have different sex.**
- **Siamese twins.**