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# **PROBLEM SET SCIENCE THEORY – I**

1. Choose the RIGHT statement
  - a. For the Moon to cover the Sun and thus to produce a solar eclipse, it must be at a full moon phase.
  - b. A star sets at 10 PM tonight. Tomorrow it will set earlier
  - c. On the opposition, Mars is in its longest distance from the Earth
  - d. The Sun never rises at South Pole in December
  - e. The Earth moves fastest at its aphelion during its revolution around the Sun(point 2)
2. Choose the RIGHT statements (may be more than one)
  - a. After the Sun, the nearest star to us is Alpha Centauri in the Southern Hemisphere
  - b. We always see the same stars all over the year due to the Earth's revolution
  - c. Supernova is a stellar outburst or explosion in which a star suddenly increases its luminosity from hundreds of thousands to hundreds of million times
  - d. A circumpolar star is a star which is always above the horizon
  - e. Andromeda is the nearest extragalaxy to us(point 2)
3. List the distance between two bodies below in right order from the smallest to the largest
  - i. The Solar System - Alpha Centauri
  - ii. The Sun – Pluto
  - iii. The Earth – the Moon
  - iv. The Earth – the Sun
  - v. The Solar System – Andromeda Galaxy(point 2)
4. What is the latitude of
  - a. The North Pole
  - b. The South Pole
  - c. A place in the Equator(point 1.5)
5. What is the phase of the Moon when it is on the meridian (the highest point) at
  - a. 6 PM
  - b. Midnight
  - c. 6 AM(point 3)
6. Venus is one of the inner planets in our solar system. Is it possible to watch it at midnight? Draw a diagram to explain your answer.  
(point 3)

7. Look at the following picture:



*Episcia* reproduces young plants by runners

From the picture above :

A. How many runners shown in the picture?

Answer:

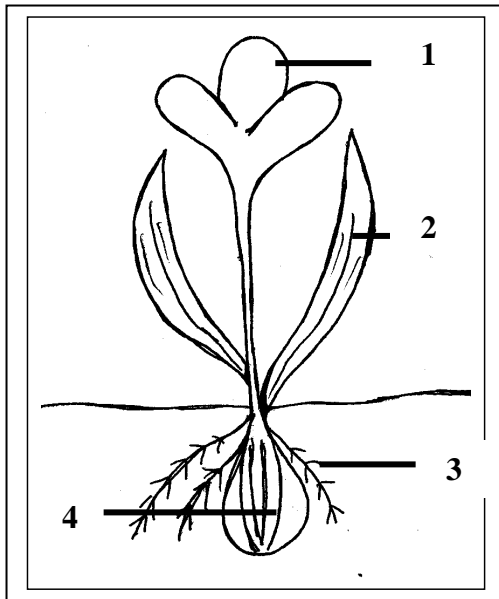
B. Which one is the oldest runner?

Answer:

C. A runner is a special kind of .....  
(choose one right answer: Stem/root/leaf/flower/plants)

(points 2)

8. Figure below shows a complete bulb plant.



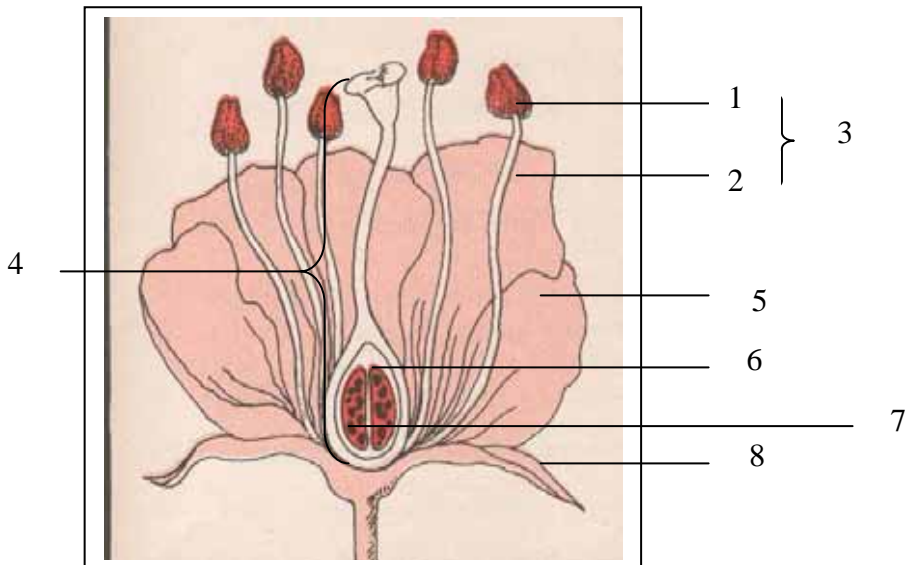
A. Part of plant which absorb water and mineral is .....

B. Part of plant which produces carbohydrates is .....

C. Where is the food stored?

(points 2)

9. Look at the figure below



Questions:

A. Write down the name of parts of the flower!

Answer:

B. Which part of flower that function to attract the insect?

Answer:

C. Which part of flower produces the pollen?

Answer:

D. How many ovary does this flower have?

Answer:

E. The flower indicates as :

- a. perfect flower
- b. imperfect flower
- c. complete flower
- d. incomplete flower

(5 points)

10. Among the following plants that can be classified into the same group are:

- A. corn, coconut, grape
- B. pine tree, lily, coconut
- C. apple, pine tree, peanut
- D. corn, lily, coconut
- E. apple, grape, pine tree

(points 2)

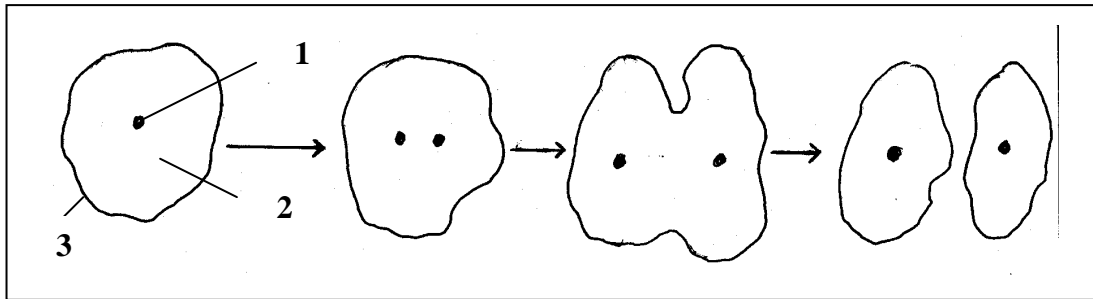
11. What is the name of the process which is responsible for the production of oxygen by green plants? **(point 1)**

Answer:

12. What are plant needed for the process in no. 11 and what substances are produced? **( point 2)**

Answer:

13. An *Amoeba* reproduces by binary fission.



Questions:

- A. What are the three parts of the cells shown in figure?
- B. Are the daughter cells exactly similar to each other?
- C. How many parents involved in binary fission?
- D. What kind of reproduction is binary fission?

5 points

14. Sexual reproduction in flowering plants
- a. is conducted through bud formation.
  - b. requires the presence of petals.
  - c. can be accomplished by grafting.
  - d. gives rise to genetically diverse offspring.
  - e. cannot result from self-pollination.

2 points

15. Pollination in the flowering plants
- a. never requires external water.
  - b. never occurs within a single flower.
  - c. always requires help by animal pollinators.
  - d. is also called fertilization.
  - e. makes most angiosperms independent of external water for reproduction.

2 point

16. Stomata in the typical green leaves,
- a. control the opening of guard cells.
  - b. release less water to the environment than do other parts of the epidermis.
  - c. are usually most abundant on the upper epidermis of a leaf.
  - d. are covered by a waxy cuticle.
  - e. close when water is being lost at too great a rate.

2 point

17. During the hurricane, birds having shorter wings will be more survived than the longer/wider ones. This situation indicates:
- a. influence of the ancestors
  - b. the stabilized natural selection
  - c. artificial selection
  - d. gene flow
  - e. biodiversity selection

2 points

### Science of the tree (no. 18 - 20)

Have you been to a park or a forest before? Do you know, trees can be as high as 20 storey building? Trees may live for hundred of years and create a nice environment in the city park. They need water and mineral like other organism to grow.



18. As you learn from the physics, water flows to the lower area, but water can travel to the top of the tree?. Could you explain this phenomenon? (3)

Answer:

3 points

19. If you sit down under the tree during day time, you can breathe freshly. However, you should not put green plants in your room during night time.

a. Can you explain why?

b. What you should do to keep the green plants in your room during night so the plant can produce oxygen?

Answer:

2 points

20. Trees are important for human being and also for the existence of ecosystem. Would you write one example of how trees can be used by other organism so that this interaction gives benefit to human being.

Answer:

2 points

21. Bats senses its surrounding using ultrasonic wave. How the rattle snakes senses its prey?

.....

Answer:

1 points

22. Flies fly quickly during daylight but they cannot move during cold morning so you can pinch them easily. Give another example of an animal, which its movement is affected by temperature.

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Answer:

1 points

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