

PRACTICE QUESTIONS FOR PLANT AND FUNGI MIDTERM

There is a single correct answer for each question – choose the **MOST** appropriate answer.

- 1) Water potential is generally **MOST NEGATIVE** in which of the following parts of a plant?
- a) **Mesophyll cells**
 - b) Xylem vessels in leaves
 - c) Xylem vessels in roots
 - d) Cells of the root cortex
 - e) Root hairs

For the evapo-transpiration process to work there must be a continual 'pull' from the top of the plant. This is caused by the loss of water from the mesophyll cells during transpiration – creating the most negative water potential. (Figure 36.11 in Campbell 6th is a very clear depiction of this).

- 2) If a short-day plant has a critical night length of 15 hours, then which of the following 24-hour cycles will **PREVENT** flowering?
- a) 8 hours light/16 hours dark
 - b) 4 hours light/20 hours dark
 - c) 6 hours light/2hours dark/light flash/16 hours dark
 - d) **8 hours light/8 hours dark/light flash/8 hours dark**
 - e) 2 hours light/20 hours dark/2 hours light

It's easy to get confused on questions like this once you start looking at the answers. For this reason it usually helps to write down what you know and what you are looking for, before puzzling over the answers. In this case you know that it is a short-day or a long- night plant. That is, it requires an uninterrupted night length longer than 15 hours to flower. a,b,c and e satisfy this but d does not.

- 3) In the life cycle of an angiosperm, which of the following stages is/are diploid?
- a) Megaspore only
 - b) Generative nucleus of a pollen grain only
 - c) Polar nuclei of the embryo sac only
 - d) **Microsporocyte only**

The microsporocyte produces the microspores by meiosis so the microsporocyte is diploid whilst the microspores are haploid. These terms are easy to confuse, although even if you are unsure of the microsporocyte/microspore distinction, you should know that b) and c) are haploid.

- 4) Which of the following describes the fate of **MOST** of the water taken up by a plant?
- a) It is used as a solvent.
 - b) It is used as a hydrogen source in photosynthesis.
 - c) **It is lost during transpiration.**
 - d) It makes cell elongation possible.
 - e) It is used to keep cells turgid.

This is pretty easy but it's an important fact to know, and rather surprising when you think about it. Plant water loss is a consequence of keeping the stomata open to allow for gas exchange, which is, in turn, necessary for photosynthesis. Water certainly makes cell elongation possible, keeps cells turgid and can act as a solvent, but the question asks you for the fate of most of the water – not its function.

- 5) Where, and by which process are sperm produced in plants?
- a) Meiosis in pollen grains.
 - b) Meiosis in anthers.
 - c) **Mitosis in male gametophytes.**
 - d) Mitosis in the micropyle.

Here is where some familiarity with the basic alternation of generations scheme will pay off. Sperm (the male gametes) are produced by mitosis in the male gametophyte.

- 6) Which of the following is **FALSE** about the life cycle of mosses?
- a) External water is required for photosynthesis.
 - b) Flagellated sperm are produced.
 - c) Antheridia and archegonia are produced by gametophytes.
 - d) **Gametes are directly produced by meiosis.**

Again, simply knowing the basic alternation of generations scheme would help here. Gametes are not produced by meiosis in plants. They are produced by mitosis by the gametophyte.

- 7) All of the following plant structures are adaptations specifically for a terrestrial environment **EXCEPT**:
- a) Roots
 - b) Xylem
 - c) **Cell walls**
 - d) Waxy cuticle
 - e) Seeds

We specifically mentioned a), b), d) and e) at one point or another as adaptations for terrestrial existence. It is not clear why c) should be a specific advantage for the terrestrial environment.

- 8) An individual flower could **NOT** lack **BOTH**:
- a) Sepals and petals
 - b) Sepals and carpels
 - c) Petals and carpels
 - d) Petals and stamens
 - e) **Carpels and stamens**

*Flowers can lack several of their constituent parts and still be considered flowers. But if they lack **BOTH** male and female parts (e) then they have lost their flower function.*

- 9) In dicot angiosperms and gymnosperms, what layer of cells designates the boundary between wood and bark?
- a) **The vascular cambium.**
 - b) The cork cambium
 - c) The casparian strip
 - d) The periderm

I hope this is a pretty easy question if you were at the appropriate lecture. Everything external to the vascular cambium is, by definition, bark.

- 10) The stalk of a mushroom contains _____ cells.
The hyphae of a(n) _____ contain crosswalls.
- a) haploid Ascomycete
 - b) diploid Ascomycete
 - c) **dikaryotic Ascomycete**
 - d) haploid Zygomycete
 - e) diploid Zygomycete

For the first part, the word 'mushroom' indicates that this is an Ascomycete. Since the basidiocarp (mushroom) exists between plasmogamy and karyogamy it is, by definition, dikaryotic. The hyphae of an Ascomycete, in contrast to a Zygomycete, have cell walls.