1. d) Correct, all of these organelles (including mitochondria) can be found in plant cells.
2. a) Correct.
3. a, c, d) No, photosynthesis does not use oxygen. It releases oxygen. Also, it does not directly synthesize ammonia.
   b) Correct.
4. d) Correct. If they belong to the same genus, they also belong to the same family and order.
5. c) Correct. Two different genera might be in the same order and family (which is true in this case) or in completely different orders and families. All we know for sure is that *Oryza* and *Zazania* are in different genera.
6. a) Correct. Rice is a flowering plant and a monocot.
7. a) Correct. The list includes anther and filament (the stamens) and stigma, style, and ovary (the pistil).
8. d) Correct. If they are wind-pollinated, they don't need to attract pollinators.
9. b) Correct. *Homo sapiens* has been the only living hominid for about the last 30,000 years. *Homo habilis* went extinct about 1.4 million years ago.
10. c) Correct. A meter is 39.4 inches. A square meter is \((39.4/12)^2 = 10.8\) square feet. There would actually be 323 rice plants per square meter.
11. a) Correct. Methane is second only to CO\textsubscript{2} as a heat-trapping, greenhouse gas.
12. d) Correct. The soil is hypertonic and sucks water from the roots. This means the roots are hypotonic and lose water to the soil. The roots will probably gain salts from the soil.
13. d) Correct. The haploid human genome has about 25,000 genes, a surprisingly small number.
14. a) Correct. Sure, this is telophase of mitosis. It shows a diploid cell with monads.
   b) No, this would have a haploid number of dyads.
   c) No, this would have a diploid number of dyads.
15. a) No, the locus on the end of one chromosome and the locus on the end of a completely different chromosome probably control completely different traits.
   b) Correct. If the rice plant is heterozygous, 1 and 2 will be different from 3 and 4.
   c) No, not if the plant is heterozygous at that locus.
16. d) Correct. Crossing over occurs between homologous chromosomes. It does not occur between sister chromatids or between nonhomologous chromosomes.
17. b) Correct. The only way every zygote will be genetically the same is if every sperm and every egg is the same. If there were some heterozygous loci (e.g., the plant was Bb), some zygotes might be BB or bb, which would not be the same as the parent.
   c) No. This would be guaranteed to develop genetically diverse offspring.
   d) No. There will be random assortment, but if all the chromosomes are the same, the offspring will still be genetically identical.
18. c) Correct. A Tt x Tt cross will produce 1/4 TT offspring. An Ff x Ff cross will produce 1/2 Ff offspring. If the loci are independent, the offspring will be 1/8 TTFf.
19. a) Correct. A Tt x Tt cross will produce 1/2 Tt offspring. An Ff x Ff cross will produce 1/2 Ff offspring. If the loci are independent, the 1/4 of all offspring will be TtFF.
20. d) Correct. The sperm can be either T, F or t, f, and the same for the eggs. Therefore, the offspring will be 1/4 TFFFF, 1/2 TtFF, and 1/4 tff. There will be no TFFf offspring.
21. b) Correct. Notice that offspring 1 is quite different from 2 and 3, and has the same genetic fingerprint as 7, 8, and 9, which we think are ff. This implies that offspring 1 is an ff. Then, assuming that offspring 2 and 3 really are FF, we see that they have more bands and more heavy bands than ff does. This gives the impression that the F allele is larger than f. The Ff plants are just combinations of the F bands and the f bands, as they should be.
   c) No. The F allele is clearly larger, and plants 2 and 3 do not have the same fingerprint as the known Ff plants.
22. d) Correct. Nucleic acids are polymers of nucleotides, not bases. Anyway, G is a purine.
23. d) Correct. The three-dimensional shape of a single polypeptide is its tertiary structure. The way two fit together is quaternary structure.
24. a) No. This shows the number of flowers responding only to the f polypeptide. The concentration of F within any row does not appear to have an effect.
   b) Correct. To get the maximum number of flowers, you have to have a high concentration of both the F and f polypeptides.
   c) No, this shows the number of flowers responding only to the F polypeptide. The concentration of f within any column does not appear to have an effect.
   d) No. This is a random response.
25. a) Correct. Hormones can only affect cells that have receptors for the hormones.
26. c) Correct. The OH group is part of the carboxyl. It is not directly bound to the alpha carbon.
27. a) No, both carbon and oxygen atoms have both an s and a p valence subshell.
   b) No, this is true, but it has nothing to do with the number of bonds.
   d) Correct. Small, nonmetallic atoms are most stable with a valence octet. If C has four valence electrons, it has room for four shared electrons and can form four bonds. If O has six valence electrons, it has room for only two shared electrons and can form two bonds.
28. a) Correct. You must see a C=O group bound to an NH group.
29. b) Correct. Codon-anticodon pairing is how it happens.
30. c) Correct.
31. d) Correct. One sperm fertilizes the egg and the other fertilizes the "polar nuclei" and form triploid endosperm.
32. a) Correct. Pure starch will not supply essential amino acids, which are needed for building proteins. Calories and glucose would be supplied in abundance by starch. I didn't want to go into it in the question, but the nutrients that are removed from milled rice are often added back in later, so an eater of white rice would not be eating pure starch.
33. c) Correct. Glycogen is the intermediate storage product in animals. Fat is the long-term storage product.
34. d) Correct. Starch is a polymer of glucose, and his blood sugar might rise. Insulin will bring it down again.
35. b) Correct. All blood returning from the body enters the right atrium. This blood is deoxygenated.
36. a) Correct. Bacteria have flagella, but they do not have cilia. Cilia are found only in eukaryotes.
37. a) No, that would be ants and wasps.
   b) No, that would be leeches.
   c) Correct.
   d) No, that would be beetles.
38. b) Correct. The nonresistant moths will die and the resistant ones will survive...directional selection.
39. d) Correct. The other circumstances imply that either resistance cannot develop or that the resistant moths have disadvantages that will limit their spread. However, this one implies that the resistant moths are probably common in the area and can easily get here once the local, insecticide-sensitive moths are eliminated.
40. a) Correct. Primary consumers are herbivores.