Solutions – Practice Test – BIOL 110 Final Exam (New Material)

Problem #1: D

We're looking for the frequency of the dominant allele = p
q^2 = the frequency of the homozygous recessive individuals = 70/200 = .35
q = the frequency of the recessive allele = $\sqrt{q^2}$ = √.35 = .59
So now we have q, and we know that p + q = 1 So:
P + .59 = 1
P = .41

Problem #2: A

We're looking for the frequency of heterozygotes = 2pq
q^2 = the frequency of the homozygous recessive individuals = 23% = .23
q = the frequency of the recessive allele = $\sqrt{q^2}$ = √.23 = .48
So now we have q, and we know that p + q = 1 So:
P + .48 = 1
P = .52
2pq = (2)(.48)(.52) = .5

Problem #3: B

Probability = $(p^2)(q^2)(2pq)$
Probability = $(.40)^2(.10)^2(2(.20)(.60))$ = .000384

Problem #4: C

We're solving this the same way we solved the last problem. The question is asking for the probability that someone in the population has the DNA fingerprint identical to the suspect, so we can ignore the other 2 fingerprints. A1 = .4, B1 = .6, C1 = .5, C2 = .2
Probability = $(p^2)(q^2)(2pq)$
Probability = $(.40)^2(.60)^2(2(.50)(.20))$ = .01152

Problem #5: B

False, the most fit organism is the one which produces the most offspring

Problem #6: B

Mutations contribute to help alter allele frequencies. Infinitely large populations, no migration, and random mating cause allele frequencies to remain unchanged.

Problem #7: C

The Founder Effect occurs when a few individuals of a population become geographically separated from the rest of the population.

Problem #8: B

False, a population in the Hardy Weinberg Equilibrium is a non evolving population.

Problem #9: C

In Frequency dependent selection, the more common phenotype is selected against.

Problem #10: A

Stabilizing Selection favors intermediate phenotype by acting against extreme phenotypes.

Problem #11: C

Intersexual selection is when males compete to be CHOSEN by females, males doing something to attract the females

Problem #12: D

No 1 concept can be used to describe all types of organisms.

Problem #13: C

Offspring forming and not developing correctly, Reduced hybrid viability, and Hybrid infertility are all types of post-zygotic isolation.

Problem #14: B

Sympatric Speciation happens when populations become genetically isolated, however they still live in the same location.

Problem #15: B

A heterosporous life cycle is one in which either a male or a female gametophyte is produced. A homosporous life cycle is where one type of gamete is produced.

Problem #16: A

The Seed is composed of an embryo (from zygote) packaged with food supply.

Problem #17: A

The xylem transports water throughout the plant. The phloem transports sugars.

Problem #18: A

True. Modern plants descended from Charophytes, an ancestral aquatic green algae.

Problem #19: A

Non vascular plants are the only plants with a dominant gametophyte (N) life stage. All other plants have a dominant sporophyte (2N) life stage.

Problem #20: C

A pine tree with cones is an example of a conifer, a non flowering seed plant (gymnosperm).

Problem #21: A

Double fertilization forms a 2N embryo and a 3N endosperm.

Problem #22: B

Gametophyte = N = 70% = .70

Sporophyte = 2N = (N x N) = (.70 x .70) = .49 = 49%

Problem #23: D

The phloem is located in the inner bark, so if you cut through the bark of a tree the whole way around, eventually, the tree is going to die, Because you have disrupted the flow of sugars through the phloem.

Problem #24: B

Cyads and Ginkos reproduce with flagellated sperm.

Problem #25: C

Fruit is a mechanism through which angiosperms protect their seeds while simultaneously attracting other animals, in the hopes that the seeds will be consumed and then deposited elsewhere after passing through the digestive tract.

Problem #26: A

In the HW equation, q is the frequency of the recessive allele, and so q^2 is the frequency of individuals that are homozygous recessive.

Problem #27: B

After formation of a (2N) zygote (via embryo), the sporophyte (2N) stage follows, then meiosis produces spores, which ultimately return to the zygote after fertilization.

Problem #28: D

Mosses are examples of bryophytes, which prefer moist environments, like the arctic.

Problem #29: B

These are examples of Bryophytes, which typically have rhizoids to help keep them anchored to the surface.

Problem #30: B

Heterosporous life cycles produce with male or female gametophytes, but not both.

Problem #31: B

The endosperm is indeed 3N, however it consists of 1 sperm and 2 polar nuclei (not 2 eggs)

Problem #32: C

Protostomes undergo determinate cleavage, as in fate of their cells are already determined. Deuterostomes undergo indeterminate cleavage.

Problem #33: B

Cnidaria, jellyfishes for example, displays radial symmetry as an adult and has 2 embryonic layers (diploblast).

Problem #34: C

Nematocysts are characteristic of some Cnidaria, remember Jellyfish can sting!

Problem #35: D

Echinoderms are deuterostome, coelomates, and radially symmetric as adults, they are bilaterally symmetric in the larval stage.

Problem #36: C

Earthworms, in the phylum Annelida, is when we begin to see segmentation, the body plan divided into different units, specializing function to different parts of the body

Problem #37: C

A chitin exoskeleton, true body segmentation, and jointed appendages are all characteristic of arthropods.

Problem #38: C

All chordates have an internal skeleton, it cannot be external.

Problem #39: C

Although in the phylum Chordata, tunicates and lancelets do not have a vertebral column (axial endoskeleton), whereas vertebrates do.

Problem #40: D

A frog is an amphibian, and they do NOT lay eggs. Reptiles, birds, and monotremes lay eggs.