

2nd Semester Biology Exam Review

For the exam, you will be allowed to have ONE 3x5 index card of information. Guidelines for it:

- **It MUST be handwritten**
- **You may write on BOTH sides**
- **It MUST be turned in with your exam and will NOT be returned to you**

Ecology: Biomes and Human Impact

- 1) What is a biome?
- 2) *Be able to identify the major biomes:*

<i>Tundra</i>	<i>Desert</i>	<i>Temperate Grasslands</i>
<i>Coniferous Forest</i>	<i>Tropical Rain Forest</i>	<i>Savannah</i>
<i>Deciduous Forest</i>	<i>Coral Reef</i>	<i>Ocean</i>
<i>Freshwater</i>		
- 3) What is a keystone species?
- 4) What is a renewable resource? Give 2 examples.
- 5) What is a nonrenewable resource? Give 2 examples.
- 6) What is the function of ozone?
- 7) What are some problems that we are having because of the hole in the ozone layer?
- 8) Does the hole in the ozone layer contribute to global warming?
- 9) What are three effects of global warming?
- 10) What problems does burning fossil fuels cause?
- 11) What caused The Flint Water Crisis and what health problems does it cause?
- 12) What caused the Wolverine Worldwide water problem in Belmont (Rockford), MI?
- 13) Why are overfishing and poaching a concern to us?
- 14) What makes a species an "invasive species"?
- 15) What are 3 things you can do to decrease your carbon footprint?
- 16) Who uses more resources: MDCs or LDCs?

Mitosis:

- 17) What makes adults bigger than babies: Larger cells or More cells?
- 18) What triggers a cell to divide?
- 19) At the beginning of mitosis, the DNA doubles. The two identical strands attach to each other and are called: _____
- 20) What is the order of the phases of mitosis? (*Be familiar with what they look like, as there is a diagram question.*)
- 21) What are the uses of mitosis?
- 22) If you start with a cell with $2n=12$ chromosomes, after mitosis you should have ____ cells with ____ chromosomes each.
- 23) What are proto-oncogenes normally for? How do they become oncogenes?
- 24) What characteristics describe a cancer cell?
- 25) What is a stem cell?

- 26) What is the difference between adult and embryonic stem cells?
- 27) What factors increase your risk for cancer?
- 28) What is a karyotype and what can it be used for?

DNA:

- 29) What is a nucleotide made of?
- 30) If a strand of DNA is 5'-AATCGGCT-3', what would be its complementary strand?
- 31) Which bases pair together in DNA strands?
- 32) What is DNA replication used for?
- 33) What is meant by the fact that DNA replication is "semi-conservative"?
- 34) What 3 things make RNA different from DNA?
- 35) What is the process of making mRNA from DNA called? Where does it occur in the cell?
- 36) What is a codon?
- 37) T or F: The genetic code is the same in every organism on the planet.
- 38) What is the process of taking the message in mRNA and assembling the actual amino acid chain called? Where does it occur in the cell?
- 39) What is a mutation?
- 40) Make sure you could identify each of the four types of gene mutation:
- 41) If a strand of DNA is 3'-GCGTCCGAA-5' what strand of mRNA will be made?
- 42) Using the strand above and a codon chart (found easily on the internet), what amino acid sequence will it build?
- 43) What is a DNA fingerprint used for?

Meiosis:

- 44) What is the purpose of meiosis?
- 45) A cell with a chromosome number of $2n=12$ goes through meiosis. It doubles ____ times, divides ____ times, and produces ____ cells with a cell number of _____.
- 46) What is the difference between diploid and haploid cells?
- 47) What are homologous chromosomes?
- 48) What is synapsis and when does it occur?
- 49) What is a zygote?
- 50) What is crossing over?
- 51) What is the order of the phases of meiosis? (*Be familiar with what they look like, as there is a diagram question. Focus especially on Prophase I and Metaphase I versus Prophase II and Metaphase II.*)
- 52) If you are XX you are a _____ and if you are XY you are a _____.
- 53) Can identical twins be of the opposite sex?
- 54) Be able to identify the different chromosomal mutations: deletion, duplication, inversion, and translocation.

Genetics and Heredity:

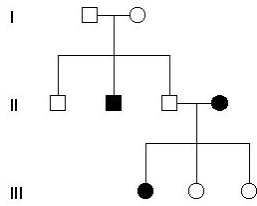
- 55) What is the difference between being homozygous and heterozygous?
- 56) What is a genotype?
- 57) What is a phenotype?
- 58) What is an allele?
- 59) What is the difference between a dominant trait and a recessive trait?
- 60) Tall (T) is dominant over short (t) in pea plants. If a heterozygous tall plant is crossed with a short plant, what percentage of the offspring will be Tt? What percentage will be short?
- 61) In cats, there is an allele for dark gray (G) and an allele for white (g). If a cat was Gg, what would it look like if the dark gray was:
 - a. Completely dominant
 - b. Incompletely dominant
 - c. Codominant
- 62) Hemophilia is a sex-linked recessive gene. How would you show the genotype of a woman who is a carrier for it? How would you show the genotype of a male who has it?
- 63) Why do men tend to get sex-linked recessive disorders more than women?
- 64) What is a dihybrid cross?

For questions 62 & 63, refer to the diagram below showing the cross between two cows. In these cows, having a long tail (L) is dominant to having a short tail (l) and being brown (B) is dominant to being white (b). The original parents are LIBb x lLBb.

	LB	Lb	lB	lb
LB				
lB				
lb			☆	
lb				

- 65) What would be the genotype of the cow in the box with the star?
- 66) What would be the phenotype of that cow?

Recessive Pedigree



- 67) In the pedigree above, what must be the genotype of the shaded male in generation II?
68) What must be the genotype of his mother and father?

EVOLUTION REVIEW

- 69) What is a theory?
70) What is LaMarck's idea for evolution? Is it correct?
71) Older fossils are found in _____ layers of rock.
72) *Be able to tell the difference between examples of directional, disruptive, stabilizing, and sexual selection.*
73) What is microevolution?
74) What is punctuated equilibrium?
75) *Be able to tell the difference between founder effect and bottleneck effect examples.*
76) *Be able to tell the difference between examples of vestigial structures, homologous structures, and embryological evidence.*
77) *Be able to use biochemical evidence (DNA or amino acid sequences) to determine relationships.*
78) *Be able to use a cladogram and a phylogenetic tree.*
79) *Be able to tell the difference between divergent evolution, convergent evolution and coevolution.*
80) What gas was absent from early Earth?
81) What organisms were first on the planet?
82) Did we evolve from chimps or monkeys?
83) What is our MOST important development as humans?

