

- 1) Analogous structures among organisms, such as bird wings and insect wings, are evidence of:
- divergent evolution
 - convergent evolution**
 - random changes
 - prezygotic isolation
 - common ancestry
- 2) Which of the following is **not** a requirement for natural selection?
- differential reproductive success
 - overproduction of offspring
 - genetic variation
 - catastrophic events**
 - inheritance
- 3) Which of the following is a hypothesis?
- My computer doesn't work.
 - My computer doesn't work because it has a virus.**
 - What is wrong with my computer?
 - My computer is too old.
 - If I erase my hard drive, my computer will work again.
- 4) What is the #1 reason why species go extinct?
- habitat loss**
 - introduced species
 - disease
 - overhunting
 - pollution
- Joe is heterozygous for a widow's peak and has the genotype Ww. Use this information to answer questions 5 and 6.
- 5) The alleles represented by letters W and w are:
- on the X and Y chromosomes
 - both dominant
 - on homologous chromosomes**
 - both present in all Joe's sperm cells
 - on the same chromosomes, but far apart
- 6) Assume now that widow's peaks are a dominant trait and Joe marries Jane, who is also heterozygous. What is the percent chance that Joe and Jane's children will have widow's peaks?
- 0%
 - 25%
 - 50%
 - 75%**
 - 100%
- 7) According to Mendel's Principle of Segregation _____.
- each pair of alleles stays together in each gamete (egg or sperm)
 - homologous chromosomes move to the same gamete
 - gametes are diploid
 - gametes have one copy of each chromosome and thus, one copy of each allele**
 - more gametes carrying the dominant allele are produced than gametes carrying the recessive allele
- 8) DNA differs from RNA because:
- DNA has a sugar-phosphate backbone and RNA has a nucleotide phosphate backbone
 - DNA has ribose sugar and RNA has deoxyribose sugar
 - DNA has guanine and RNA has adenine
 - DNA has thymine and RNA has uracil**
 - DNA is single stranded and RNA is double stranded
- 9) If adenine makes up 30% of the bases in a DNA double helix, what percentage of the bases are guanine?
- 80%
 - 60%
 - 40%
 - 20%**
 - 30%
- 10) In an evolutionary sense, why is it dangerous to use antibiotic drugs to treat patients with viral infections?
- it's not- most people expect drugs when they go to the doctor
 - by increasing your dependence on antibiotics, you are compromising the health of your immune system
 - you may become immune to antibiotics
 - antibiotics do not kill viruses and bacteria that are in your system can become resistant to antibiotics**
 - viruses become resistant to the antibiotics
- 11) What are alleles?
- homologous chromosomes
 - environmental factors that affect gene expression
 - alternate forms of a gene**
 - alternate phenotypes
 - non-homologous chromosomes

- 12) We are concerned that, sometime in the 21st century as the number of humans on Earth approaches 10 billion, that we may reach the limit of the number of people that the planet can sustain. This idea is an application of which principle?
- ecological equilibrium
 - niche separation
 - J curve
 - carrying capacity
 - exponential growth
- 13) What type of reproductive isolating mechanism is demonstrated by a situation in which female frogs will only mate with males that have a certain call?
- behavioral isolation
 - habitat isolation
 - temporal isolation
 - post-zygotic isolation
 - hybrid sterility
- 14) You are a farmer here in Palouse growing lentils and wheat (what else?). You remember learning about integrated pest management in Biology 102 class at "Wazzu." Ahem, I mean WSU. Which of the following are part of an integrated pest management strategy?
- careful use of pesticides
 - use of natural predators of crop pests
 - use of natural competitors of crop pests
 - bioengineering crops that are resistant to pests
 - all of the above
- 15) Which of the following are prokaryotes?
- bacteria
 - fungi
 - plants
 - insects
 - mammals
- 16) Which of the following is **not** evidence of descent with modification?
- relatedness of life forms (e.g., hierarchy)
 - change through time (e.g., pepper moth)
 - transitional forms in the fossil record
 - life on earth is old (geological evidence)
 - giraffes that stretched to reach higher leaves have offspring with longer necks
- 17) One reason not to cut down the tropical rainforest is because a plant species may hold a cure for cancer. This idea represents which way that biodiversity can be valued, according to lecture?
- economic
 - potential
 - aesthetic
 - ecological
 - intrinsic
- 18) Competition between two species can most likely result in:
- mimicry
 - resource partitioning
 - crypsis
 - chemical defense
 - mutualism
- 19) The basic order of the steps of protein synthesis is:
- DNA->translation->mRNA->transcription->protein
 - DNA->transcription->tRNA->translation->protein
 - mRNA->transcription->DNA->translation->protein
 - DNA->transcription->mRNA->translation->protein
 - DNA->mRNA->transcription->translation->protein
- 20) What is the main difference between stem cell research and cloning?
- Pre-embryos are "harvested" at the zygote stage in stem cell research
 - Pre-embryos are "harvested" at the blastocyst stage in stem cell research
 - stem cell research involves a surrogate mother
 - cloning produces tissues, stem cell research produces new individuals
 - cloning involves replacing nuclei of eggs, stem cell research involves replacing nuclei of sperm
- 21) How did scientists tell that illegal whale meat was being sold in Japan?
- they aligned DNA sequences of random samples collected from Japanese markets with those collected from known species in the ocean
 - they saw fisherman catching whales
 - they compared VNTR loci of "fish" being sold in markets and whales and found a match with illegal species
 - they tasted the meat of whales and those sold in Japanese markets
 - none of the above
- 22) Which of the following is a practical application of cloning?
- Dolly the sheep
 - Gene therapy
 - making crops resistant to pests
 - Glow in the dark rabbit
 - all of the above are applications of cloning research

- 23) Why do some doctors suggest a period where no drugs should be used when treating patients with HIV?
- the patient's immune system can rebound and fight off the infection
 - HIV evolves drug resistance and susceptible strains of HIV will rebound when drugs are removed
 - drugs mutate quickly
 - HIV causes only the strongest T cells in the patient to survive; when drugs are removed, the patient is healthy again
 - all of the above
- 24) The age structure of humans in Mexico is as follows: 50% pre-reproductive age, 30% reproductive age, 20% post-reproductive age. What do you predict will happen to the number of people in Mexico?
- increase
 - decrease
 - remain stable
 - decrease, then increase
 - decrease, then remain stable
- 25) William Paley is responsible for which idea?
- intelligent design
 - natural selection
 - "conditions of existence"
 - "Scala Naturae"
 - hierarchical classification of organisms
- 26) Approximately how long ago did *Homo sapiens* (modern humans) evolve?
- 100,000 years
 - 500,000 years
 - 1.8 million years
 - 2.5 million years
 - 4.4 million years
- 27) Allopatric speciation could be caused by:
- a volcano or other geographic barrier
 - salmon that breed in the same stream but at different times
 - gall flies that breed in the same field, but on different gall plants with different predators
 - an error in cell division of a plant that causes it to be reproductively incompatible with neighboring plants
 - none of the above
- 28) Which of the following is **not** a potential reason why we see so many different species on the Earth (think about angiosperms and Cambrian Explosion).
- plate tectonics and continental drift
 - all life has a nucleus as a component of cells
 - climate fluctuates regularly, causing big freezes and then glacial recession
 - mass extinctions
 - complex predator-prey relationships
- 29) Which of the following is a key characteristic of chordates?
- they include insects
 - they are pseudocoelomates
 - they have a notochord
 - they include the gastropods
 - they are radially symmetrical
- 30) Which of the following most closely resembles a population in the biological sense?
- the human population
 - the Snake River fish population
 - the Costa Rican bird population
 - the Palouse White-Tailed Deer population
 - the Flying purple people eater population
- 31) Grazing animals such as horses and cows are:
- Producers
 - Primary consumers
 - Secondary consumers
 - Tertiary consumers
 - Quaternary consumers
- 32) An organism feeding at multiple trophic levels is called a/an:
- Producer
 - Secondary consumer
 - Omnivore
 - Quaternary consumer
 - Herbivore
- 33) How much chemical energy (stored as biomass) is available to primary consumers from 10,000 kcal of primary productivity?
- 1 kcal
 - 10 kcal
 - 100 kcal
 - 1000 kcal
 - 10,000 kcal

- 34) The Gulf Stream and Japan currents both move clockwise from a southerly point of origin in the northern hemisphere. What is the result of these currents?
- Warming at northern latitudes
 - Warming at southern latitudes
 - Stabilization at all latitudes
 - Cooling at northern latitudes
 - Cooling at southern latitudes
- 35) The Humbolt current might most directly be associated with:
- Warming Western Australia
 - Cooling Eastern Africa
 - Warming the British Isles
 - Cooling western South America
 - Cooling Eastern South America
- 36) Which of the following is/are not directly associated with ascending (rising) moist air in the tropics:
- Release of moisture into the tropics
 - An area of calm called the "doldrums"
 - Polar ice caps
 - Descending dry air over the tropics
 - Dry and Tropical rainforests
- 37) Seasons are a direct result of:
- The distance between Earth and the sun
 - The tilt of the planet as it orbits the sun
 - The orientation of the nine planets of solar system
 - The angle of the sun relative to the equator
 - Global warming
- 38) According to lecture, of the following abiotic factors, which has the most significant impact on producers?
- Disturbance
 - Sunlight
 - Temperature
 - Wind
 - Rocks
- 39) Which of the following is a secondary consumer?
- An herbivorous insect
 - A detritivore
 - A seed eating bird
 - A carnivorous plant
 - An insect eating bird (insectivore)
- 40) The by-products of cellular respiration are:
- Glucose and oxygen
 - ADP and ATP
 - Carbon dioxide and water
 - ATP and glucose
 - A phosphate group and water
- 41) The principle known as 'Conservation of Energy' states that:
- Energy is either created or destroyed
 - Energy can neither be created nor destroyed
 - 25% use of alternative energy sources must be achieved by 2013
 - Kinetic energy is the product of motion
 - Energy cycles and chemicals flow
- 42) Which of the following would not be a potential result of increasing temperature in an aquatic biosystem?
- Reduce available oxygen
 - Increase the rate of evaporation
 - Increase the metabolism of phytoplankton
 - Change in the community composition
 - Reduce salinity in the system
- 43) Which of the following is/are true of cellular respiration?
- Cells use oxygen to help harvest the energy potential of organic food molecules
 - Light generation from cellular metabolism accounts for about 60% of the energy released
 - Heat generated from fuel consumption in cells is rarely used by terrestrial mammals
 - This process builds organic fuel molecules from inorganic materials.
 - In the absence of oxygen, Nitrogen may be substituted
- 44) An aerobic process (such as cellular respiration...):
- Requires nitrogen
 - Requires carbon dioxide
 - Requires light
 - Requires oxygen
 - Requires water
- 45) Which statement is not correct?
- The metabolic pathway for cellular respiration includes Glycolysis, the Krebs Cycle, and electron transport
 - Cellular respiration is responsible for the conversion of energy used to do cellular work
 - Cellular respiration is a single reaction
 - Cellular respiration requires the intake of protein
 - Cellular respiration occurs within the cytoplasm, the interior of the mitochondria, and through the membranes of mitochondria

- 46) Energy is made directly available for cellular work when:
- ATP is released by fatty acids
 - ATP gains a phosphate group
 - ATP is energized by light
 - ATP loses a phosphate group**
 - ADP is energized by light
- 47) Of the foods humans consume, which group can be used as fuel for cellular respiration?
- The macronutrients; Fat, carbohydrates, and protein**
 - The micronutrients; zinc, calcium, and phosphorus
 - Sugar, starch, and iodine
 - Only carbohydrates
 - Only fatty acids
- 48) Cellular reproduction is most closely associated with which of the following?
- Fertilization of oocytes
 - Insuring genetic variability in the next generation
 - Replacing lost or damaged cells**
 - Metastasis
 - Production of gametes
- 49) The Cell Cycle, which includes interphase and mitosis, is found in:
- Eukaryotes and prokaryotes
 - Prokaryotes only
 - Archaea only
 - Eukaryotes only**
 - Phytoplankton only
- 50) Disruption during interphase will most directly affect:
- Cytokinesis
 - Duplication of DNA**
 - Spindle formation
 - Formation of the cell wall
 - Distribution of organelles
- 51) Carcinomas and melanomas include:
- Cancers of the non-neural brain cells
 - Cancers of the blood-forming tissues
 - Cancers of the connective tissue
 - Cancers of the skin and pigment**
 - Cancers of the brain and thyroid
- 52) Epithelial cancers are the most common malignancies and are called:
- Carcinomas**
 - Melanomas
 - Gliomas
 - Sarcomas
 - Leukemias
- 53) The temperate deciduous forest is characterized by
- Its presence near the poles
 - The strong influence of trade winds
 - Permafrost and the presence of tall trees
 - Dense stands of deciduous trees**
 - Large herbivores and their predators
- 54) Which of the following biomes are heavily influenced by, or dependent on fire?
- Savanna, Chaparral, and desert
 - Tropical forest, Chaparral, and temperate grasslands
 - Temperate grasslands, chaparral and Savanna**
 - Chaparral, Desert, and tundra
 - Coniferous forest, deciduous forest, and tropical forest.
- 55) Heterotrophs include
- All plants
 - All protists
 - All animals**
 - All bacteria
 - All eukaryotes
- 56) Which of the following results in an interruption to electron transport?
- Food poisoning
 - Trisomy 21
 - Non-hodgkins lymphoma
 - Cyanide and Carbon Monoxide poisoning**
 - Neural tube defects
- 57) Grain plants such as soybeans, oats, and wheat:
- Take CO₂ directly from the air**
 - Increase sugar production at night
 - Open stomata to decrease water loss
 - Have adaptive enzymes that allow collection of CO₂ from air spaces in leaves
 - Store CO₂ for release to the Calvin cycle
- 58) Plants located in the desert are likely to:
- Take CO₂ directly from the air during day and night
 - Bank CO₂ by night**
 - Collect CO₂ from air spaces in the leaves by way of specialized enzymes
 - Have decreased productivity in dry weather
 - Stop sugar production to conserve energy
- 59) Which of the following is/are directly related to wind as an abiotic factor?
- Slowing metabolism in plants
 - Concentration of urine in kidneys
 - Ground level competition
 - Patchiness of the landscape
 - Dispersal of pollen and seeds**

- 60) Wind results most directly from:
- Global warming
 - Uneven heating of air masses
 - Uneven heating of water
 - Ocean currents
 - Seasons
- 61) Winds in the temperate region of the northern hemisphere blow
- East to West
 - West to East
 - More strongly in the summer than in the winter
 - More weakly at night than by day
 - Based on the amount of moisture in the air
- 62) Which abiotic factor has the most limiting effect in lakes?
- Sunlight
 - Wind
 - Temperature
 - Wind
 - Rocks
- 63) Salivary glands release enzymes important to the digestion of
- Beef
 - Peanuts
 - Butter
 - Pasta
 - Milk
- 64) Energy pyramids represent:
- The rate of biomass production
 - The amount of digestible protein
 - The level of biomass storage at each trophic level
 - The recommended balance of foods in the human diet
 - The relative abundance of lean muscle to fat
- 65) Phytoplankton and rooted plants are most likely to be found:
- In the photic zone of freshwater biomes
 - In the absence of phosphorus
 - In marine systems that are subject to seasonal turnover
 - As a result of artificial input of fertilizers
 - In coral reefs
- 66) The benthic zone of a freshwater system
- Represents a transitional zone between salty and fresh extremes
 - Is rich with algae eating insects such as mayfly larvae
 - Is dominated by detritivores
 - Is dominated by motile animals and passive drifters
 - Is usually cool, clear, and low in nutrients
- 67) Animals found in the slower, wider downstream portion of a stream with a high-mountain source are generally:
- More dependent on vision than those upstream
 - At the producer level of this ecosystem
 - Easily moved from fresh to saltwater ecosystems
 - Those that can burrow in mud
 - More dependent on taste and smell than organisms in the clear water upstream
- 68) Which of the following is not considered a human impact on the environment?
- Natural levels of greenhouse gases
 - Loss of biodiversity
 - Increased global warming since the industrial revolution
 - Depletion of atmospheric ozone
 - Distribution of exotic (introduced) species
- 69) Seasonal mixing in freshwater biomes serves to:
- Replenish dissolved nutrients in the benthic zone
 - Increase the amount of available light in the photic zone
 - Increase solute concentrations throughout the water column
 - Replenish dissolved oxygen in the benthic zone
 - Equalize temperatures from the surface to the bottom of the lake
- 70) The open ocean or pelagic zone...
- Supports mainly motile animals
 - Supports mainly detritivores
 - Is dependent on mixing with freshwater
 - Consists mainly of attached algae and fungi
 - Provides a rich food source of rooted plants
- 71) The biggest abiotic reservoir for carbon is:
- Fossil fuels
 - Soil
 - Decaying organic debris
 - The atmosphere
 - Plants
- 72) Pregnancy is most likely to occur:
- Near the end of the cycle (Days 21-28)
 - At the middle of menstrual cycle (Days 12-17)
 - At the beginning of the menstrual cycle (Days 1-7)
 - Only with female orgasm
 - Just prior to the date when a period is expected

- 73) The recommended food intake for most people includes:
- About 60% grains
 - About 40% protein
 - At least 12% fat
 - No more than 50% carbohydrates
 - 6-11 serving of fruits and vegetables
- 74) The Body Mass Index:
- Includes a factor for athletic ability
 - Is a direct measure of your percentage of lean muscle to fat
 - Is measured in a doctor's office by using calipers
 - Establishes a guide for weight relative to height
 - Remains constant throughout adulthood
- 75) What factor has the most significant contribution to the nutrient richness of a temperate deciduous forest?
- The burning of grasses
 - Wastes from grazing animals
 - Decaying leaves
 - Direct input of nutrients from rainfall
 - Vertical stratification
- 76) Desert animals may demonstrate which adaptive strategy?
- Acclimation
 - Behavioral adaptation
 - Physiological adaptation
 - Structural adaptation
 - All of the above are possible
- 77) According to lecture and our text, the most fertile soil is associated with:
- Deserts
 - Deciduous Forests
 - Grasslands
 - Tundra
 - Tropical forests
- 78) Where would I find a Chaparral biome?
- At northern-most latitudes
 - At southern-most latitudes
 - Near the equator
 - In mid-latitude coastal areas
 - At the edge of a deciduous forest
- 79) Select the correct pair:
- March equinox and equator facing the sun directly
 - March equinox and the northern hemisphere tilting toward the sun
 - December solstice and the equator facing the sun directly
 - June solstice and the northern hemisphere tilting away from the sun
 - September equinox and the northern hemisphere tilting toward the sun
- 80) What would you expect to be the effect on primary consumers if large numbers of secondary consumers disappeared?
- An increase due to loss of predators
 - No change, the system would immediately rebalance
 - A decrease due to loss of production
 - A change in the main diet of primary consumers
 - Migration to a more stable ecosystem

Did you write your name on the scantron?

Did you write your number on the scantron?

Did you fill in the bubbles for your name and student number?

Did you answer all 80 questions?

Did you erase completely when you changed answers?

Best wishes for a safe and happy summer!

Dr. Storfer, Dr. Marshall, and the biology TA team