

Last Name _____ First name _____ SS No. _____

Check to make sure that your name and SS# are coded correctly on your computer answer sheet
Answer questions 1-35 on the Scantron

True/False (A = true, B = false), 20 questions, one point each

1. The age of the Universe is about 15 billion years.
2. It is highly likely that life exists elsewhere (besides earth) in the Universe.
3. The main evidence in favor of the Big Bang theory & an expanding universe is the Red shift.
4. The Spark Chamber experiment provided evidence in favor of biosynthesis.
5. The first organisms evolved on earth about 3.8 million years ago.
6. All primary production in the ocean is a result of photosynthesis.
7. Speciation occurs because of Divine Intervention.
8. All species in nature are "fixed" and do not change.
9. 99.9% of all species that ever evolved on earth are extinct today.
10. Impacts from comets, asteroids & meteorites changed the course of evolution many times over during the last 600 million years.
11. In general, terrestrial ecosystems have more trophic levels than marine ecosystems.
12. In the sea, at each trophic level, about 90% of the organic matter produced is passed up the food chain to the next trophic level.
13. The sea is about 20 times more productive than the land.
14. The decline of reef fisheries in Hawaii is primarily due to pollution.
15. Ninety percent of the world's catch is caught in 10% of the world's oceans.
16. Overfishing is linked to overpopulation in the world.
17. The tolerance range of an organism is called its carrying capacity.
18. Coral reefs in Hawaii are generally very healthy.
19. Communities are groups of species held together by common needs and interdependencies.
20. Sewer outfall discharges in the ocean in Hawaii do not pollute coral reefs.

Multiple choice; 15 questions, pick the best answer; one point each

21. The Cambrian Explosion was caused by: a) the evolution of sexual reproduction, b) the build-up of ozone in the atmosphere, c) evolutionary radiation of species d) all of the above
22. The hierarchy of the modern taxonomic system (in order) is:
 - a) Kingdom, Class, Phylum, Family, Order, Genus, Species
 - b) Phylum, Kingdom, Class, Family, Order, Genus, Species
 - c) Kingdom, Phylum, Class, Order, Family, Genus, Species
 - c) Phylum, Kingdom, Class, Order, Family, Genus, Species

23. If the evolutionary clock were to be replayed on planet earth again:
 a) the same species would probably evolve, b) different species would probably evolve,
 c) human beings would probably evolve again.
24. The temperature of the earth's atmosphere is expected to increase by about _____ in the next 100 years. a) -1.8 to +10 C, b) +1.4 to +3.5 C, c) 0 C to +100 C, d) +5 C to +10 C.
25. Around a hydrothermal vent you will never find:
 d) symbiotic bacteria, b) red-colored tube worms, c) sulfide deposits, d) sea grasses
26. The world annual fish harvest from the ocean is: a) about 85 million tons, b) is no longer increasing, c) taken primarily in areas of high productivity, d) all of the above
27. Most fish populations are depleted because of:
 a) over-fishing, b) pollution, c) they grow too slow, d) natural mortality .
28. Primary production is controlled by: a) upwelling, b) the concentration of nutrients, c) depth of the mixed layer, d) all of the above.
29. Terrestrial ecosystems have _____ food chains than marine ecosystems
 a) longer and less efficient, b) shorter and more efficient, c) longer and more efficient, d) shorter and less efficient.
30. Upwelling usually: a) increases the temperature of surface waters, b) decreases productivity of surface waters, c) decreases the nutrients in surface waters, d) none of the above
31. Chemosynthetic communities at hydrothermal vent sites get their energy from:
 a) the sun, b) chemicals in the heated water, c) manganese nodules, d) giant worms
32. The most important sources producing sea level rise caused by increased atmospheric CO₂ levels are: a) melting of glaciers, b) melting of polar ice caps, c) warming of the surface ocean causing thermal expansion, d) all of the above
33. A group of organisms linked by complex feeding inter-relationships is known as a
 a) food source, b) food web, c) food cycle, d) prey-predator relationship
33. Most biological production occurs in the:
 a) abyssal zone, b) compensation depth, c) euphotic zone, d) pelagic zone
35. In a food chain, the second trophic level organisms are called:
 a) carnivores, b) herbivores, c) primary producers, d) bacteria

Fill in the blank spaces with the best answer, 15 questions, one point each:

- 36 & 37. The ocean was formed by volcanic _____ of water, and the accumulation of water from _____ hitting the earth.
38. The building blocks of life are called _____ and have been produced in the laboratory in an apparatus called the _____.
39. Whales are in the Phylum _____.
- 40.& 41. Evolution proceeds by two kinds (patterns) of change, called: _____ and/or _____.
42. Upwelling zones are zones of high _____.
43. Giant kelp is sometimes called a _____ species.
44. The distribution pattern of abundance of most species is _____.
45. Commensalism is an example of symbiosis in which only one species _____.
46. The orderly replacement of species or communities over time within ecosystems is called _____.
47. The role that an organism plays in its environment is called its _____.
- 48 & 49. The impact of a pollutant on a species population depends on its _____, and _____.
50. The expulsion of symbiotic algae (zooxanthellae) by corals is called _____.

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Essay questions, five questions, 5 points each

1. Name and define 5 processes that control the **evolution of species**. Briefly explain their interaction.

2. Illustrate a biomass trophic pyramid with a sketch and identify 4 trophic levels. Explain ecological efficiency and distinguish the difference between it and biomagnification.

3. Write the formula for photosynthesis and list 3 things it requires.

4. With the use of a diagram, explain the theory of fisheries management for a given stock of fish. Also explain what compensatory factors allow for the sustainable management of the stock.

5. With a graph, diagram the approximate growth of the human population over the last few hundred or more years. Indicate size (number of people) of the present population. Also show an approximate carrying capacity for the earth and briefly comment why this is important for the future of the marine environment and/or fisheries.