

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

Name _____ ID# _____

Section _____

OCN 201 Spring 2013 Final Exam (75 pts)

True or False (1 pt each). A = TRUE; B= FALSE

- 1) Dinoflagellates are responsible for harmful algal blooms.
- 2) Under commensalism both organisms benefit from a prolonged interaction between species.
- 3) Microplankton are more numerous than bacteria in 1L of seawater.
- 4) Heterotrophic protists consume prey by phagocytosis.
- 5) The White cliffs of Dover are made of diatomaceous earth.
- 6) The world's commercial fish catch (wild caught fish) has been increasing over the last 10 years.
- 7) Nutrient availability limits primary production in subtropical gyres.
- 8) Eutrophication always leads to the development of Dead Zones.
- 9) Countershading is an important form of camouflage in the aphotic zone.
- 10) Heterotrophs can be single-celled or multicellular.
- 11) Two of the three domains of life consist of prokaryotes.
- 12) One defining feature of life is the ability to self-replicate.
- 13) One important mechanism used to regulate fisheries mortality is to control fishing effort (e.g., the # boats, amount/size of gear).

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

- 14) Larvaceans (appendicularians) are suspension or particle feeders.
- 15) Amino acids are the primary building blocks of nucleic acids.
- 16) Ctenophores paralyze and kill prey with cnidocytes.
- 17) Pelagic organisms live in the water column.
- 18) The largest fish on Earth are carnivores.
- 19) Chemoautotrophs use chemical energy to fix carbon.
- 20) Animals in the deep scattering layer migrate to the surface to feed during daytime.
- 21) Zooxanthellae are important photoautotrophic symbionts in stony corals.
- 22) Temperate marine ecosystems have both a Fall and a Spring bloom.
- 23) Red bodies look blue under bioluminescent light in the aphotic zone.
- 24) Urochordates are invertebrates within the phylum Chordata.
- 25) Parasitic males are an important adaptation to food limitation in the deep sea.

Multiple Choice (2 pts each)

26. Batesian Mimicry is when:
- A. Two or more inedible species all evolve to look similar, maximizing the efficiency with which predators learn to avoid them.
 - B. Organisms use color to mimic background surfaces.
 - C. An edible species evolves to look similar to an inedible species to avoid predation.
 - D. Organisms include behavioral modifications to increase their camouflage.
 - E. An edible species evolves to look similar to another species involved in a mutualistic interaction.

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

27. The most basal phyla in the animal tree of life are:
- A. Placozoa & Molluscs
 - B. Placozoa & Sponges
 - C. Segmented worms & Molluscs
 - D. Echinoderms & Cnidarians
 - E. Flatworms & Arthropods
28. The 'Tragedy of the Commons' occurs when:
- A. There is no regulation to prevent habitat destruction in the benthos.
 - B. Individuals act in self-interest.
 - C. Oil tanker spills decimate coastal wildlife.
 - D. Resources are held in common, but costs are shared by everyone.
 - E. B & D.
29. Life on Earth is based primarily on:
- A. Carbon
 - B. Helium
 - C. Oxygen
 - D. Nitrogen
 - E. Sulfur
30. Regenerated production is based on nutrients that are:
- A. Brought into the euphotic zone from deeper waters through mixing Helium
 - B. Upwelled in equatorial divergence zones
 - C. Recycled in deep water, and mixed up into the euphotic zone
 - D. Recycled in the food web
 - E. Upwelled in coastal ecosystems
31. The most diverse group of fishes are:
- A. Chondrichthys
 - B. Agnatha
 - C. Odontocetes
 - D. Procellariiformes
 - E. Osteichthys
32. The euphotic zone is within the:

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

- A. abyssopelagic
 - B. epipelagic
 - C. mesopelagic
 - D. littoral
 - E. subtidal
33. Stromatolites are important early fossils because they:
- A. Demonstrate that life evolved in the deep sea.
 - B. Provide the first unambiguous evidence of prokaryotic life.
 - C. were found in Australia, which was extremely cold in early Earth history.
 - D. Typically contain organic compounds similar to those found in space (e.g., on meteorites).
 - E. Provide the first evidence of eukaryotes.
34. The region that will warm the most due to climate change is:
- A. The tropics
 - B. The Antarctic
 - C. The Arctic
 - D. The deep sea
 - E. The coastal/littoral zone
35. The Darwin point is:
- A. The place at which coral growth is exceeded by island subsidence, and an atoll drowns
 - B. Another name for the hotspot (melting anomaly) that creates the Hawaiian Island chain.
 - C. The point at which two diverging lineages become distinct species.
 - D. A peninsula in the Galapagos, where Darwin conceived of the idea of evolution by natural selection.
 - E. The idea that natural selection is responsible for standing genetic diversity within populations.
36. Mercury content in tuna is often higher than in sardines and anchovies because:
- A. Tuna live in marine habitats that are close of coastal point sources of pollution.
 - B. Tuna live deeper in the water column, where mercury levels are higher.
 - C. Of bioaccumulation of toxins at higher trophic levels.
 - D. Of bioaccumulation of toxins at lower trophic levels.

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

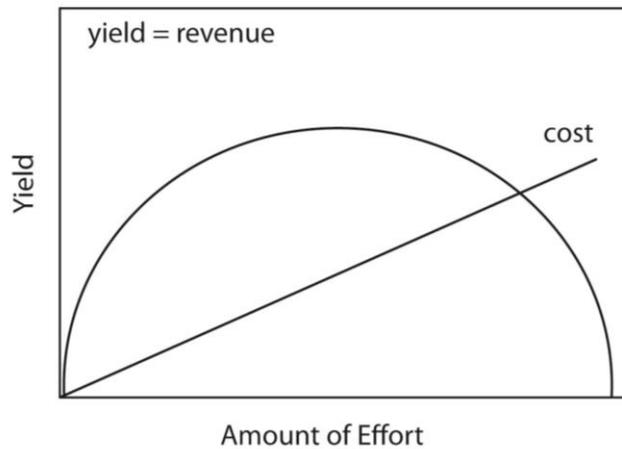
- E. Tuna have higher fat content, and toxins are often concentrated in fatty tissue.
37. Oil pollution in the marine environment is primarily from:
- A. Oil refineries
 - B. Natural seeps
 - C. Land & river runoff
 - D. Oil tanker spills
 - E. Oil rig accidents
38. Most of the primary production in the open ocean is conducted by:
- A. Picoeukaryotes
 - B. Cyanobacteria
 - C. Sargassum
 - D. Diatoms
 - E. Dinoflagellates
39. Peduncle feeding enables:
- A. Mixotrophs to augment their nutrient uptake through heterotrophy.
 - B. Heterotrophic protists to consume organisms larger than themselves.
 - C. Cephalopods to reach prey hidden in cavities.
 - D. Corals to survive bleaching events.
 - E. Parasitic fish to suck blood and tissue from their hosts.
40. Which of these organisms is not a mollusk?
- A. pteropod
 - B. nudibranch
 - C. sea cucumber
 - D. octopus
 - E. clam

Short Answer (3-5 pts each):

- 1) (5 pts) The graph below depicts a simple model of the bioeconomics of fisheries. The plot shows how fisheries yield and cost change as a function of fishing effort. Draw and label on the figure (A) the maximum sustainable yield, and (B) the maximum profit obtainable from this fishery (2 pts). Then in the space below, describe why there is a tendency to overfish (or

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

overharvest) unregulated fisheries, following the ideas of this simple model (3 pts).



- 2) (4 pts) Give 1 example each of direct and indirect effects of climate change on marine organisms (2 pts), AND explain the difference between direct and indirect effects (2 pts).

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

3) (4 pts) List and define the 4 key concepts that underlie evolution by natural selection (1 pt each).

4) (3 pts) In a food chain, the biomass decreases at each successively higher trophic level. What is the term for this distribution (1 pts), and why does it happen (2 pts)?

OCN 201 SPRING 2013 FINAL EXAM – GOETZE

- 5) (4 pts) On the graph below are three lines showing how three different variables vary with depth in the ocean. Write the letter of the line that represents the expected shape for NUTRIENTS (2 pts): _____ . Briefly explain why it has that shape (2 pts).

