Exam #1 Key, Spring 2013, all sections

1. Define:

Growth through assimilation – Growth when applied to microorganisms refers to an increase in cell number rather than to an increase in cell size. Growth through assimilation is a characteristic of life and means that organisms take in materials from their environment, and then through catabolism and anabolism, reorganize these materials so as to form new cell parts. Eventually cells elongate and undergo fission, forming new cells.

Facilitated diffusion – Facilitated diffusion is a passive transport process involving the net movement of particles down concentration or electrical gradients with the assistance of integral proteins within cellular membranes. Ions and small organic compounds are typically moved by this means.

Taxonomy – Taxonomy is the science or study of the classification of living organisms, and involves dividing organisms into categories based on specific established criteria. Biological classification is expected to show natural relationships between organisms as well as phylogeny (evolutionary history) of organisms. As criteria have changed, so have taxa.

2. Microbiology/ Anton van Leeuwenhoek

3. Matching letter sequence is – D, A, E, B, F and C.

4. Joseph Lister

5. Robert Koch/ Koch was seeking to demonstrate the causal relationship between a specific type of microorganism (*Bacillus anthracis*) and a specific disease (anthrax), but his postulates were also applicable to other types of bacteria and the diseases they caused. He provided proof that disease was not the result of sinful behavior nor was it linked to any type of supernatural power.

6. Mutations/ response to environmental stimuli

7. Water/ hydrolysis

8. Matching letter sequence is – J, D, B, I, C, E, H, G, A and F.

9. Phospholipids/ integral and peripheral proteins/ amphipathic or amphiphilic

10. Simple diffusion

11. Active transport/ antiport or antiporter

12. Osmosis/ contractile vacuoles

13. Cytostome/ phagocytosis

14. Positive chemotaxis/ quorum sensing

15. Kinesin and dynein

16. Mitochondria/ ATP/ 70S ribosomes, ccc-DNA, sensitivity to antimicrobial drugs, and the ability to reproduce by means of fission. Any **two** of these were accepted.

17. DNA and proteins (histones and enzymes)

18. Peritrichous flagellar

19. Pili and fimbriae

20. Matching letter sequence is – D, C, G, B, J, F, K, A, L, E, H and I.

21. Structures associated with eukaryotic cells were A, E, F, G, H, K and L, while those associated with prokaryotic cells were A, B, C, D, E, F, I and J.

22. Gram-positive

23. Genus and species

24. Chemoheterotrophs/ saprotrophs

25. Mesophiles (Always read beyond the blank!)

26. Matching letter sequence is – B, D, F, E, A and C.

27. Organisms able to grow and reproduce with or without oxygen available to them are called facultative anaerobes or facultative aerobes/ metabolism

28. Matching letter sequence is – C, G, E, H, F, A, D and B.

29. Luciferase/ leghemoglobin

30. Archaea

31. Define:

Methanogenic – Organisms capable of making methane and releasing it as a metabolic waste product are methanogenic. Certain types of Archaea make methane using carbon dioxide and hydrogen. The methane formed by such organisms

represents a potential energy source for humans, but is also a potentially harmful greenhouse gas.

Lichens – Lichens are symbionts, or organisms formed by two different types of organisms (fungi and algae or fungi and Cyanobacteria) living together in a close and mutually beneficial relationship. The fungi form a layer outside the phototrophic cells, providing protection and metabolic water. The algae provide sugar and oxygen the fungi can use; if Cyanobacteria are involved, they can provide sugar, oxygen and nitrogen in a form the fungi can use for metabolic activities.

Definitive host – A definitive host is an organism supporting the adult form of a multicellular parasite, or the organism supporting those forms of parasites engaged in sexual reproduction. Sheep and humans can serve as definitive hosts for liver flukes such as *Fasciola hepatica*, but mosquitoes are definitive hosts for protozoa such as *Plasmodium*.

32. Matching letter sequence is – C, J, E, F, D, H, I, G, B and A.

33. Haustoria/ mycorrhizae

34. Mycology/ aerial mycelium

35. Karyogamy/ sporophyte

36. Fungi are the original source of β-lactam antibiotics, they form many types of organic acids and solvents, enzymes and other types of proteins (sometimes those initially formed by other types of cells, because fungi can be genetically engineered).

37. Hallucinogenic (they are the source of LSD).

38. Matching letter sequence is – D, G, E, H, J, A, B, F, C and I.

39. Eutrophication/ Algae can form oxygen during daylight hours, but at night they use oxygen, and if abundant in water, can use up so much oxygen they cause fish to suffocate and die. Some algae also attack and kill fish, but this is less common.

40. Carotinoids

41. Endophytic

42. Pseudopodia

43. Trophozoite/ trichocysts

44. Monoecious/ Advantages include; less damage to any single host organism, less competition between adult and immature parasites for available resources, so

improved survival of individuals, and this spreads the population among multiple different hosts, so improves survival potential of the population overall.

45. Matching letter sequence is – G, H, J, F, I, B, D, C, A and E.

46. Ectoparasites are often vectors involved in the transmission of microorganisms and viruses known to be etiological agents. They do not cause or transmit disease, but they do transmit agents potentially capable of causing disease.