AP Exam Group Review
Day 1

1 - red berry
2 - red
3 - orange
4 - Dark yellow
5 - Green
6 - Dark Cyan
7 - Cornflower blue
8 - blue
9 - purple
10 - pink
11 - Black

Highlighted answers need revision

Vocabulary

Directions:

- Claim your word.
- Define it.
- Identify the units associated with it.
- Use it (correctly) in a sentence

Glyco- & Gluco-: "Of relating to sugar"

- Glycolipid 1
- Glycolysis 2
- Glycocalyx 3
- Glycoprotein 4
- Glucagon 5
- Glycogen 6
- Glycerol 7
- Glucose 8

Trans-: "across"/ "beyond" / "through"

- Transport Protein 9

- Transfer RNA 10
- Transmission (re: neurons) 11
- Transposon 1
- Transduction 2
- Transverse Tubule (aka "T-tubule") 3
- Transport Vessicle 4
- Transgenic Organism 5
- Translocation (re: ribosome) 6
- Transcription Factor 7

Theme 1: Structure & Function

Directions:

- Claim your prompt.
- Respond fully.

1. **Discuss how the structure of a protein affects a muscle's contraction.** 8
2. **Discuss how the structure of a protein affects enzyme activity** 9
3. **Describe how the physical properties of water contribute to thermoregulation in endotherms.** 10
4. **Describe how the physical properties of water contribute to transpiration.** 11
5. **Describe how the physical properties of water contribute to plasma membrane structure** 1
6. **Describe a function that requires the conformational change of a protein** 2
7. **Discuss the difference between cellulose & starch & how that affects digestion in animals.** 3

8. **Discuss the levels of protein structure & the role of specific types of bonds at each level.** 4

9. **Describe a countercurrent exchange system & explain its adaptive advantage.** 5

10. **Describe an adaptation that increases surface area in an animal system. Explain how this improves the function of that system.** 6

11. **Describe an example of a structure-function relationship at the molecular level in animals.** 7

12. **Describe an example of a structure-function relationship at the molecular level in plants.** 8

13. **Describe an example of a structure-function relationship at the cellular level in animals.** 9

14. **Describe an example of a structure-function relationship at the cellular level in plants.** 10

15. **Describe an example of a structure-function relationship at the tissue level in animals.** 11

16. **Describe an example of a structure-function relationship at the tissue level in plants.** 1

17. **Describe an example of a structure-function relationship at the organ level in animals.** 2

18. **Describe an example of a structure-function relationship at the organism level in animals.** 3

19. **Describe an example of a structure-function relationship at the organism level in plants.** 4

AP Exam Group Review Day 2

Vocabulary

Directions:

- Claim your word.
- Define it.
- Identify the units associated with it.
- Use it (correctly) in a sentence

-sis: "condition", "state"

- Glycolysis 5
- Symbiosis 6
- Phagocytosis 7
- Photosynthesis 8
- Lysis 9
- Exocytosis 10
- Electrophoresis 11
- Plasmolysis 1
- Chemiosmosis 2
- Apoptosis 3
- Pinocytosis 4

- Endocytosis 5
- Photolysis 6
- Receptor-Mediated Endocytosis 7
- Osmosis 8
- Mitosis 9
- Meiosis 10
- Hydrolysis 11

Theme 2: Evolution

Directions:

- Claim your prompt.
- Respond fully.

1. **Explain the difference between gradualism & punctuated equilibrium.** 1
2. **Explain heterozygote advantage. Give an example and explain how your example works.** 2
3. **Explain how antibiotic resistance can evolve in bacteria and how pesticide resistance can evolve in an insect population.** 3
4. **Describe homologous structures, analogous structures, and vestigial organs. Explain their evolutionary significance & give an example of each.** 4
5. **Explain the biological species concept as first proposed by Ernst Mayr. Compare it to the ecological and morphological species concepts.** 5
6. **In a cat population, the black allele is dominant to white. There are 16% white cats. How many black cat homozygotes & heterozygotes in the population? Assume HW equilibrium. State the criteria that are required for the population to be in HW Equilibrium.** 6
7. **Define a population bottleneck and the founders effect. Explain their evolutionary significance & give an example of each.** 7

8. Explain directional selection, disruptive selection, and stabilizing selection. Give an example of each. 8

9. Explain sexual selection & give two examples. 9

10. Explain genetic drift & give two examples. 10

11. Explain how evolution can explain both the diversity and unity of life on earth. 11

12. Explain how the anatomical record, the molecular record, and the fossil record all support evolution. Give an example. 1

13. Explain how natural selection works. 2

14. Explain the difference between Darwinian and LaMarckian Evolution. 3

15. Explain how artificial selection supports evolution. Give three examples. 4

16. List and describe the pre-zygotic barriers that contribute to speciation. 5

17. List and describe the post-zygotic barriers that contribute to speciation. 6

18. Define allopatric and sympatric speciation and explain how both occur. 7

AP Exam Group Review Day 3

Vocabulary

Directions:

- Claim your word.
- Define it.
- Identify the units associated with it.
- Use it (correctly) in a sentence

-tion/-sion: a common suffix to make nouns from latinate verbs

- Substrate-level phosphorylation 8
- Fermentation 9
- Translocation (re: chromosome) 10
- Translocation (re: plant) 11
- Insertion (re: DNA) 1
- Photo-phosphorylation 2
- Deletion (re: DNA) 3
- Oxidative phosphorylation 4
- Transpiration 5
- Transcription 6
- Fertilization 7

- Transformation 8
- Gastrulation 9
- Respiration 10
- Neurulation 11
- Translation 1
- Inversion 2
- Duplication (re: DNA) 3

Trans-: "across"/ "beyond" / "through"

- Transport Protein 4
- Transfer RNA 5
- Transmission (re: neurons) 6
- Transposon 7
- Transduction 8
- Transverse Tubule (aka "T-tubule") 9
- Transport Vessicle 10
- Transgenic Organism 11
- Translocation (re: ribosome) 1
- Transcription Factor 2

Theme 3: Regulation

Directions:

- Claim your prompt.
- Respond fully.

1. **Describe the regulation of population size by natural controls.** 3
2. **Describe the regulation of genes in bacteria through a repressible operon.** 4
3. **Describe the control of the movement of solute molecules & water across the cell membrane.** 5
4. **Describe the regulation of gene expression in eukaryotes.** 6
5. **Describe the regulation of the cell cycle by cdk and cyclin.** 7
6. **Describe the regulation of ecological succession by fire.** 8
7. **Describe the allosteric regulation of an enzyme. Give an example.** 9
8. **Describe the regulation of genes in bacteria through an inducible operon** 10
9. **Describe & diagram the regulation of osmolarity of the blood (insert a drawing of your own creation NOT something you find online).** 11
10. **Describe & diagram the regulation of pulse rate in mammals (insert a drawing of your own creation NOT something you find online).** 1
11. **Describe & diagram the regulation of blood sugar (insert a drawing of your own creation NOT something you find online).** 2
12. **Describe & diagram the regulation of calcium ion concentration in blood (insert a drawing of your own creation NOT something you find online).** 3
13. **Describe & diagram the regulation of body temperature in mammals (insert a drawing of your own creation NOT something you find online).** 4
14. **Describe & diagram the regulation of metabolism by thyroxine (insert a drawing of your own creation NOT something you find online).** 5
15. **Describe & diagram the regulation of the human female reproductive cycle (insert a drawing of your own creation NOT something you find online).** 6
16. **Explain how the innate immunity and innate immunity (B Cells and T cells) protect vertebrates from invasion by specific pathogens.** 7

17. **Describe and diagram how a hydrophobic hormone like a sex hormone triggers the response of a target cell (insert a drawing of your own creation NOT something you find online).** 8

18. **Describe and diagram how a hydrophilic hormone like insulin triggers the response of a target cell (insert a drawing of your own creation NOT something you find online).** 9

19. **Describe and diagram the regulation of plant growth by a plant hormone (insert a drawing of your own creation NOT something you find online).**

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AP Exam Group Review
Day 4

Vocabulary

Directions:

- Claim your word.
- Define it.
- Identify the units associated with it.
- Use it (correctly) in a sentence

Co-: "together"

- Coenzyme 11
- Community 1
- Cotransport 2
- Cooperativity 3
- Cohesion 4
- Commensalism 5
- Competition 6
- Codominance 7

Hyper-: "above", "beyond", "over" | Hypo-: "below", "under", "less" | Iso-: "equal" "same"

- Hypertonic 9

- Hypotonic 9
- Isotonic 10

Homo-: "same" "alike" | Hetero-: "different" "othere"

- Homozygote 11
- Homologous 1
- Heterozygote 2
- Heterochromatin 3

eu-: "true", "well

- eukaryote 4
- euchromatin 5
- eudicot 6
- eubacteria 7

Theme 4: Continuity & Change

Directions:

- Claim a prompt.
- Respond fully.

1. **Diagram mitosis in an organism where 2n = 4. Include a drawing of your own creation NOT one you find online.** 8
2. **Diagram meiosis in an organisms where 2n = 4. Include a drawing of your own creation NOT one you find online.** 9
3. **Compare and contrast mitosis and meiosis.** 10
4. **Explain the functions that mitosis serves in unicellular organisms, and in multicellular organisms. Also Explain how mitosis allows for genetic continuity, and how meiosis makes sexual reproduction possible.** 11

5. Describe the three major checkpoints of the cell cycle, and what occurs at each checkpoint. 1

6. Explain the effects of proto-oncogenes and tumor suppressor genes in controlling the cell cycle, and the consequences of the loss of this regulation. 2

7. Describe Mendel's laws of Dominance, Segregation, and Independent Assortment. Connect segregation and independent assortment to events in meiosis. 3

8. Explain the difference between dominant and recessive alleles. Provide an example of a simple dominant-recessive inheritance pattern. 4

9. Explain the difference between codominance and independent assortment. Provide examples of each. 5

10. Explain the phenomena of gene-linkage and sex-linked traits and give examples of each. 6

11. Explain the difference between epistatic and pleiotropic inheritance patterns and give an example of each. 7

12. Explain polygenic inheritance patterns, how polygenic traits can be identified, and give an example of a polygenic trait in the human population. 8

13. Explain the difference between missense, nonsense, neutral, and silent mutations. 9

14. Explain what a gene duplication mutation is, and describe its potential effects. 10

15. Explain what substitution and insertion/deletion mutations are, and describe their effects on a gene product. 11

16. Provide an example of an autosomal dominant and an autosomal recessive genetic disease in humans. 1

17. Explain how sex determination is accomplished in mammals, and describe two sex chromosomal abnormalities and how they affect the organism. 2

18. Describe the process of DNA replication. Identify the functions of all major enzymes. 3