ANTH 215 - Physical Anthropology

STUDY GUIDE FOR EXAM-1


Format: ~70-75 Multiple-choice.

PLEASE BRING A CALCULATOR TO THE EXAM.

Ch. 1 What is anthropology, physical anthropology, subfields, etc.

Ch. 2 Review the history of evolutionary thought, Darwinian evolution and natural selection.

Ch. 3 Review the basic biology of a cell (its structures and functions), the basic nature and characteristics of chromosomes, how cells divide (be able to differentiate mitosis from meiosis), the structure and function of DNA and the concept of the gene.

Ch. 4 Understand the basic principles of inheritance; Mendel's two laws: the law of segregation and the law of independent assortment. Review the four modes of inheritance in humans and be able to give examples of traits that are governed by each. The causes of evolution (natural selection, mutation, migration, drift, etc.). Be able to cite examples of each in human populations. For example, why has the sickle-cell allele been maintained in such high frequencies in certain areas? Understand the importance of genetic variation in populations and how natural selection and other factors act upon variation.

Ch. 14 What are the conditions necessary for Hardy-Weinberg equilibrium? How do gene frequencies change in modern populations? Review the mathematical and theoretical bases of population genetics and how to calculate gene and genotype frequencies using Hardy-Weinberg equilibrium. Be able to work genetic problems. What are genetic polymorphisms and why are they important in studies of human evolution? ABO, Rh, and MN red blood cell antigens. Review the concept of race and the modern and historic approaches to the study of races. What is racism? What is the relationship between race, behavior and environment. What is intelligence?

Ch. 15 Review how humans adapt to particular environmental situations, especially those that require physiological adjustments, including solar radiation, cold, heat, humidity and altitude. Population variation with regard to traits such as skin color, body size and shape, and examples of bio-cultural evolution with reference to lactose intolerance, patterns of disease, etc. should be reviewed.

Ch. 16 Growth and Development. Review stages of growth, adolescent growth spurt, morphological growth curves, and factors that affect growth including hormonal, disease, and nutritional inadequacies.
I. **Terms and Concepts to Know**

The handouts distributed at each lecture contain a number of terms and concepts that you should know for the exam. In addition to these, the following have been extracted from the text. Some of these overlap those distributed in class. Together, they provide a good review.

### Chapter 1
- anthropometry
- bipedalism
- adaptation
- anthropology
- applied anthropology
- artifacts
- bioarchaeology
- biocultural evolution
- culture
- data
- DNA (deoxyribonucleic acid)
- ethnographies
- evolution
- forensic anthropology
- hominins
- hypotheses
- osteology
- paleoanthropology
- paleopathology
- primates
- primatology
- quadrupedal
- savanna/savannah
- scientific method
- theory

### Chapter 2
- acquired characteristics
- Linnaeus
- Carolus Linnaeus
- George Cuvier
- Alfred Wallace
- Buffon
- Charles Lyell
- Erasmus Darwin
- Thomas Malthus
- Charles Darwin
- Lamarck
- Watson & Crick
- variation
- evolution
- population
- catastrophe

### Chapter 3
- allele
- amino acids
- autosomes
- chromosomes
- centromere
- codons
- cytoplasm
- diploid
- DNA (deoxyribonucleic acid)
- enzymes
- gametes
- gene
- genome
- haplotype
- hemoglobin
- homeobox genes
- homologous
- hormone
- Human Genome Project
- karyotype
- locus
- meiosis
- messenger RNA (mRNA)
- mitochondria
- mitochondrial DNA
- (mtDNA)
- mitosis
- molecules
- mutation
- nuclotides
- nucleus
- point mutation
- polymerase chain reaction
- (PCR)
- protein synthesis
- proteins
- random assortment

### Chapter 4
- allelic frequency
- antigens
- autosome
- autosomal
- dominant/recessive traits
- codominance
- continuous trait
- discrete (discontinuous) trait
- dominant
- endogamy
- founder effect
- gamete
- gene flow (migration)
- gene pool
- genetic drift
- genotype
- hemizygous
- heterozygous
- homogygous
- hybrids
- linked
- macroevolution
- Gregor Mendel
- Mendelian trait
- microevolution
- mutation
- natural selection
- P1 generation
- F1 generation
- F2 generation
- pedigree chart
- phenotypes
pigment  
pleiotropy  
point mutation  
population  
polygenic  
principle of independent assortment  
principle of segregation  
recessive  
selective breeding  
sex chromosomes  
sex-linked traits  
sickle-cell trait  
tandem repeat  
variation(genetic)  
zygote

Chapter 14
ABO blood type  
assortative (non-random) mating  
balanced polymorphism  
biological determinism  
breeding isolates  
cline  
endogamy  
eugenics  
exogamy  
gene pool  
Hardy-Weinberg theory of genetic equilibrium  
HLA  
inbreeding  
incest avoidance  
lactase persistence  
mother-fetus incompatibility

Chapter 15
acclimatization  
AIDS  
Allen's Rule  
Bergmann's Rule  
biological determinism  
brachycephalic  
dolicocephalic  
endemic  
eugenics  
evaporative cooling  
homeostasis  
hypoxia  
immune response  
immunity  
infectious disease  
monogenism  
nervous system  
neural tube  
pathogens  
polygenism  
pleiotropic genes  
selectivity  
stress  
typology  
vasoconstriction  
vasodilation  
vectors  
zygotic

Chapter 16
adolescence  
adolescent growth spurt  
Cretinism  
diaphysis  
dizygotic  
epigenetics  
epigenome  
epiphysial  
essential amino acids  
evolutionary medicine  
malnutrition  
menarche  
menopause  
monozygotic  
pleiotropic genes  
senescent  
undernutrition  
hypothalamus  
TSH  
growth hormone  
estrogen  
testosterone  
thyroxin  
sexual dimorphism  
cross-section study  
longitudinal study
Velocity curve  
distance curve  
Scammon's curve  
spina bifida  
menopause  
menarche  
homeostasis
II. **Multiple Choice** Some examples of multiple choice questions are provided (answers are attached).

1. The term *biocultural evolution* refers to:
   a. biological changes in a species over time.
   b. changes in human culture from generation to generation.
   c. the interaction between biology and culture in human evolution.
   d. biological evolution in all species except humans.
   e. none of these

2. The study of human evolution as evidenced by the fossil record is:
   a. paleoanthropology
   b. osteology
   c. primatology
   d. anthropometry
   e. paleopathology

3. Two arms composed mainly of DNA and held together by centromere is a:
   a. gene
   b. cell
   c. protein
   d. chromosome

4. Cell division resulting in the development of two daughters cells identical to the mother cell defines:
   a. mitosis
   b. crossing over
   c. Meiosis
   d. protein synthesis

5. A nucleotide consists of:
   a. the nucleic acids, RNA and DNA
   b. messenger RNA and transfer RNA
   c. the four chemicals: adenine, thymine, guanine, cytosine
   d. one sugar, one-phosphate, and one of the four chemicals given in c.

6. A change in one base of an amino acid sequence may produce a change called:
   a. a tetrad
   b. a zygote
   c. a point mutation
   d. independent assortment

7. When Mendel crossed peas with Rr and Rr alleles, the changes of getting rr offspring was:
   a. 100%
   b. 75%
   c. 50%
   d. 25%

8. Genes exist in pairs in individuals; during the production of gametes, the pairs are separated so that a gamete has only one of each kind. This is known as the:
   a. law of gametic production
   b. principle of segregation
   c. average phenotypic ratio
   d. reduction division hypothesis

9. Endogamy means:
   a. having very similar genotypes
   b. having very similar phenotypes
   c. picking a mate from within the population
   d. picking a mate from outside the population
   e. choosing a mate from another species
10. Which of the following does Hardy-Weinberg equilibrium not assume?
   a. the population is infinitely large
   b. mating in non-random
   c. no mutation
   d. no natural selection
   e. no migration

11. The formula, \( p^2 + 2pq + q^2 \), expresses:
   a. the allele frequencies
   b. the genotypic proportions
   c. the total number of phenotypes
   d. the mutation rate
   e. all of these

12. An individual with sickle-cell anemia:
   a. usually dies early in life from malaria
   b. carries the sickle-cell allele in double dose
   c. is a carrier of the \textit{Plasmodium} genotype
   d. a and b only

13. An Rh incompatibility between mother and fetus:
   a. can only occur if the mother is Rh-
   b. can only occur if the father is Rh+
   c. can only occur if the fetus is Rh+
   d. usually occurs in the second or later pregnancies
   e. all of these

14. Most biological and social scientists are in agreement that race and intelligence:
   a. are not genetically related
   b. are genetically related
   c. are genetically but not culturally related
   d. were not related in the past but are today

15. Dark skin is advantageous in the tropics because it
   a. protects from frostbite.
   b. helps prevent rickets.
   c. allows maximum exposure to ultraviolet radiation.
   d. promotes vitamin D synthesis.
   e. protects from overexposure to ultraviolet radiation.

16. Physiological responses to cold include:
   a. shivering.
   b. reduction of skin temperature.
   c. increased metabolic rate.
   d. all of these.
   e. A and C only.

17. The most efficient means of dissipating body heat is:
   a. sweating.
   b. increasing blood flow to the skin's surface.
   c. decreasing blood flow to the skin's surface.
   d. exercising.
   e. increasing production of hemoglobin.

18. Which of the following body types appears to be best suited to hot, dry climates?
   a. linear
   b. short and stocky
   c. tall and heavy
   d. stocky
   e. heavily muscled
19. A short-term adjustment humans make to altitude is:
   a. decreased red blood cell production.
   b. decreased heart rate.
   c. increased red blood cell production.
   d. decreased respiration rate.
   e. increased fertility.

20. Identifying each species by two Latin terms is called the:
   a. Malthusian doctrine.
   b. binomial system.
   c. Lamarckism.
   d. uniformitarianism

21. Kwashiorkor is:
   a. an inadequate intake of calories.
   b. seen in people with high protein diets.
   c. a vitamin deficiency.
   d. always fatal.
   e. a deficiency of protein in the diet.

**ANSWERS TO MULTIPLE CHOICE**

1. C
2. A
3. D
4. A
5. D
6. C
7. D
8. B
9. C
10. B
11. B
12. B
13. E
14. A
15. E
16. D
17. A
18. A
19. C
20. B
21. E