Conquer

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2019 HSC BIOLOGY LECTURE GIFT

1000 QUESTIONS
(FREE RESPONSE & MCQ QUESTIONS)

PART II
(200/1000)

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Question 101: Which of the following most likely causes genetic drift in a population?

(A) Interbreeding of species within population
(B) Species in population with high genetic variation
(C) Large population size
(D) A low mutation rate that is consistent across a long period of time

Question 102: Homeostasis can be viewed as the

(A) Biotic substances produced in body
(B) Tendency for biological systems to resist change
(C) Tendency for biological systems to change with external environment
(D) Disturbance of an internal environment.

Question 103: In RNA, the nitrogenous base, thymine, is replaced by

(A) Guanine
(B) Adenine
(C) Cytosine
(D) Uracil

Question 104: Which of the following refers to the term where both alleles are expressed together.

(A) Dominance
(B) Codominance
(C) Amphidominance
(D) Pseudodominance

Question 105: Which of the following can account for the reason why the next generation offspring of a population may be less adaptive than the current generation

(A) Mutation
(B) Genetic Drift
(C) Natural Selection
(D) Homeostasis

Question 106: Which of the following hormone(s) govern the female human's menstrual cycle?

(A) LH
(B) FSH
(C) FSH, LH, oestrogen
(D) Progesterone

Question 107: For a total of 64 different codon sequences, only 20 of the 64 specify for different proteins. This is due to

(A) Mutation
(B) Degeneracy of genetic information
(C) DNA replication error
(D) Single nucleotide polymorphism

Question 108: Which of the following is true about Meiosis II?

(A) DNA replication and duplication of centomere
(B) Separation of sex chromosomes
(C) Separation of homologous chroimosomes
(D) Separation of chromatids

Question 109: A mutation occurring at a chromosome's locus that alters a characteristic of an individual as a result of a change in

(A) DNA replication
(B) Protein structure
(C) Protein synthesis process
(D) Ribosome recognition of codons

Question 110: For X-linked recessive traits, which of the following is true?

(A) There is a 50% chance that males will exhibit the trait.
(B) Both male and female have equal chance of exhibiting the trait.
(C) All females that inherits the recessive allele will exhibit the trait.
(D) All males that inherits the recessive allele will exhibit the trait.

Question 111: Explain the importance of thermoregulation, that is, the regulation of core body temperature in humans.

Question 112: Explain the importance to maintain the right concentration of glucose in the blood.

Question 113: Explain what is meant by a negative feedback mechanism, providing an example in your response.

Question 114: Hypothermia is when the core body temperature drops below 35 degrees Celsius. It occurs as a result of the heat loss to environment is greater than the heat produced via internal metabolic pathways. Explain whether hypothermia is an example of a negative or positive feedback mechanism.

Question 115: Distinguish between homozygous and heterozygous, providing an example for each in your answer.

Question 116: Explain the reason why some mutation may affect the order of amino acid whilst other mutations do not.

Question 117: Which of the following about mutagenic agents is true?

(A) Ultraviolet Radiation is a chemical mutagen
(B) DNA replication error due to mis-reading is an event caused by mutagenic agent
(C) They accelerate the rate of spontaneous mutation
(D) They are responsible for spontaneous mutation

Question 118: If the DNA fragments from two distinct individuals appear at different distances in gel electrophoresis machine during DNA profiling, which of the following is true?

(A) The DNA fragments' nucleotide sequence can be found and compared.
(B) The DNA fragments have different short tandem repeats.
(C) One of the DNA fragments are positively charged and the other is negatively charged.
(D) None of the above.

Question 119: Describe how DNA profiling can be used to analyse the genetic variation in a population.

Question 120: Describe how DNA profiling can be used to determine genetic relationships such as between a father and his lost child.

Question 121: Explain the reason for the use of DNA amplification in DNA profiling and sequencing.

Question 122: Explain how DNA profiling can be used to identify species that are least genetically related to such that they can be bred together to support the continuity of species.

Question 123: Describe the function of the Bowman's Capsule.

Question 124: Describe the function of the renal artery and renal vein.

Question 125: Describe what is meant by 'Ultrafiltration'.

Question 126: Describe the function of the collecting duct.

Question 127: Describe the function of the descending Loop of Henle.

Question 128: Describe the function of the ascending Loop of Henle.

Question 129: Describe the structure and function of the glomerulus.

Question 130: Describe the function of the proximal tubule.

Question 131: Describe the function of the distal tuble.

Question 132: Describe the substances that are actively and/or passively re-absorbed back into the blood from the nephron.

Question 133: Describe the structure and role of the kidney.

Question 134: Draw the structure of a nephron and label the regions of the nephron that are within the renal cortex, middle medulla and outer medulla.

Question 135: Describe the structure and function of the iris.

Question 136: Describe the structure and function of the cornea.

Question 137: Describe the structure and function of the lens.

Question 138: Describe the structure and function of the pupil.

Question 139: Describe the structure and function of the conjunctiva.

Question 140: Describe the structure and function of the aqueous humour.

Question 141: Describe the structure and function of the vitreous humour.

Question 142: Describe the structure and function of the retina.

Question 143: Describe the structure and function of the sclera.

Question 144: Describe the structure and function of the fovea.

Question 145: Describe the structure and function of the ciliary body.

Question 146: Describe the structure and function of the Pinna.

Question 147: Describe the structure and function of the Ear canal.

Question 148: Describe the structure and function of the Eustachian tube.

Question 149: Describe the structure and function of the Incus, Malleus and Staples.

Question 150: Describe the structure and function of the oval window.

Question 151: Describe the structure and function of the round window.

Question 152: Describe the structure and function of the cochlea.

Question 153: Describe the structure and function of the auditory nerve.

Question 154: Describe the structure and function of the tympanic membrane.

Question 155: Compare the endocrine and nervous system by listing four differences.

Question 156: Explain how mutations in specific genes can cause cancer.

Question 157: Explain how genetic and environmental factors govern the risk of an individual developing cancer.

NOTE: For the following Q158 – 160, you only need to know ONE of the three non-infectious diseases (e.g. Cancer or Nutritional Disease or Environmental Disease) in terms of their treatment/management strategies, future research direction and an example of the disease for External HSC Biology Exams.

Question 158: Explain the treatment or management strategies currently available for a named cancer.

Question 159: Explain the treatment or management strategies currently available for a named nutritional disease.

Question 160: Explain the treatment or management strategies currently available for a named disease caused by environmental exposure.

Question 161: Describe how mutation can lead to the generation of new alleles.

Question 162: Describe the term 'internal coordination system'.

Question 163: Which of the following is true for the study of Mt-DNA and Y chromosomes in human evolution?

(A) Their genetic information can be analysed more easily due to their small size.
(B) They are derived from both parents.
(C) They are derived from one parent only and they are not affected by recombination after crossing over.
(D) Their chemical structure is better understood than other genetic material.

Question 164: Describe the role of rRNA in protein synthesis.

Question 165: Describe how genetic engineering can involve the use of genetically modified organisms to produce proteins in medical applications.

Question 166: Describe how genetic engineering allows the modification of organism characteristics that are used in agricultural biotechnology.

Question 167: Explain the development of antibiotic resistance, provide an example in your response.

Question 168: Explain the development antiviral drug resistance, provide an example in your response.

Question 169: Describe the action of antibiotics.

Question 170: Describe the action of antivirals.

Question 171: Describe the mode of transmission and adaptations of a named prion that allow their entrance into a host.

Question 172: Describe the mode of transmission and adaptations of a named **virus** that allow their entrance into a host.

Question 173: Describe the mode of transmission and adaptations of a named **bacterium** that allow their entrance into a host.

Question 174: Describe the mode of transmission and adaptations of a named **protozoan** that allow their entrance into a host.

Question 175: Describe the mode of transmission and adaptations of a named **fungus** that allow their entrance into a host.

Question 176: Describe the mode of transmission and adaptations of a named **macro-parasite** that allow their entrance into a host.

Question 177: The two main regulatory systems to maintain homeostasis in the human are

(A) Lymphatic and circulatory systems
(B) Nervous and circulatory systems
(C) Nervous and endocrine systems
(D) Circulatory and respiratory systems

Question 178: Define the term 'stimulus'.

Question 179: Which of the following is a non-specific defence mechanism against pathogens?

(A) Antibodies
(B) Phagocytes
(C) Cytotoxic T cells
(D) Plasma cells

Question 180: When a tRNA approaches a ribosome, which of the following is true about tRNA?

(A) tRNA will match its anticodon to the corresponding mRNA codon via complementary base pairing.
(B) tRNA will add an amino acid to the propagating polypeptide chain.
(C) tRNA will remove introns from the mRNA.
(D) tRNA will stop the propagating polypeptide chain.

Question 181: Given that colour blindness is inherited via a X-linked recessive gene, which of the following is **always** true for a female that is colour-blind?

(A) The female's father is not colour blind.
(B) The female's mother is colour blind.
(C) Both of the female's parents must have the allele responsible for colour-blindness.
(D) The female's mother is not colour blind but is a carrier.

Question 182: Dogs often pant to lower their core body temperature by

(A) Sweat glands
(B) Vasoconstriction
(C) Vasodilation
(D) Accelerated heat loss by convection

Question 183: Explain the role of the lymphatic system in human's innate immunity.

Question 184: Explain the role of histamine in human's innate immunity.

Question 185: Explain the role of cytokines in human's adaptive immunity.

Question 186: Distinguish between actively and passively acquired immunity, providing an example of each.

Question 187: Distinguish between innate and adaptive immunity, providing an example of each.

Question 188: Which of the following is true about the inflammation response?

(A) It is an example of adaptive immunity
(B) It is specific to the invading pathogen
(C) It involves the production of B and T cells.
(D) It allows the transportation phagocytes to the site of infection.

Question 189: Define the term extinction.

Question 190: Describe what is meant by 'selective reabsorption' that occurs in the kidney's nephrons.

Question 191: Describe how cochlear implants can be used to assist with hearing loss.

Question 192: Describe how bone conduction implants can be used to assist with hearing loss.

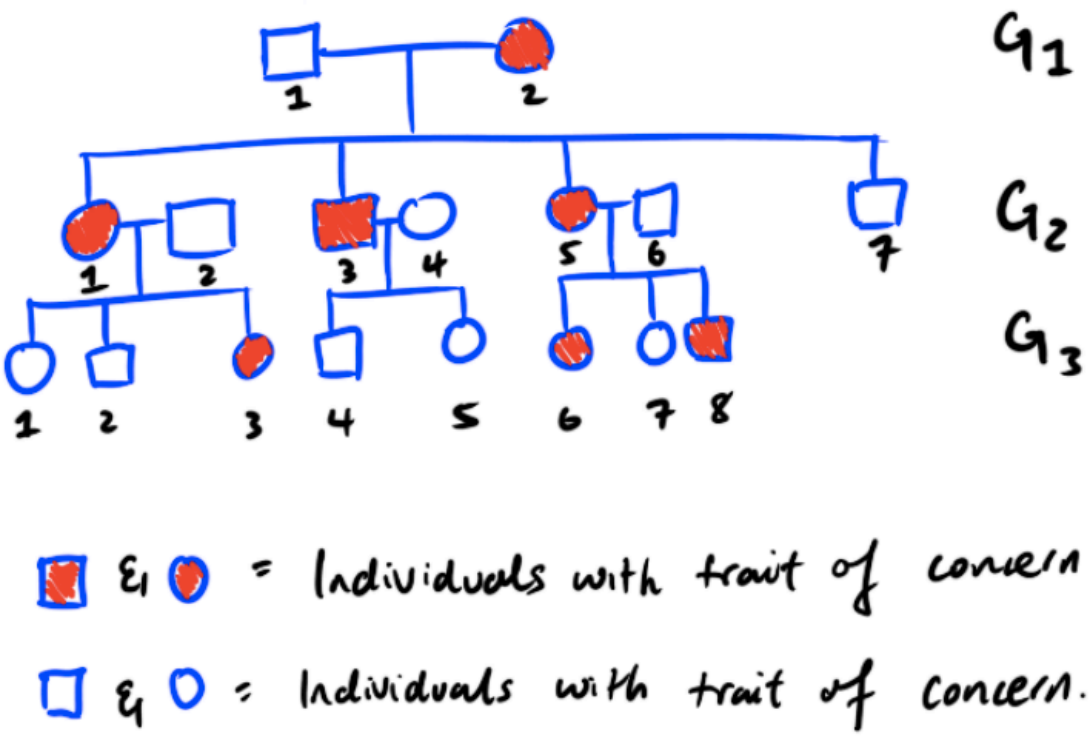
Question 193: Describe how hearing aids can be used to assist with hearing loss.

Question 194: Describe how spectacles can be used to assist with visual disorders.

Question 195: Describe how laser surgery can be used to assist with visual disorders.

Question 196: Describe how renal dialysis can be used to assist with loss of kidney function.

Use the following pedigree to answer Question 197 – 199



Question 197: What is the most likely mode of inheritance for the trait of concern?

(A) Autosomal recessive
(B) X-linked recessive
(C) Y-Linked dominant

(D) Autosomal dominant

Question 198: What is the probability of a hypothetical female offspring that is produced by III-3 of having the trait of concern obtained from III-3?

(A) 25%
(B) 33%
(C) 50%
(D) 100%

Question 199: What is the probability of a hypothetical male offspring from III-3 and III-6 of having the trait of concern?

(A) 75%
(B) 50%
(C) 25%
(D) 0%

Question 200: Explain how genetic drift can lead to speciation.