# AAU MEDICINE COC QUESTIONS

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1. The largest unit in which gene flow is possible is:

- a. Population
- b. Species
- c. Genus
- d. Subspecies
- e. Population
- Answer: B (Species)
  - Explanation: GENE FLOW, THE TRANSFER OF GENETIC MATERIAL, TYPICALLY OCCURS WITHIN A SPECIES. WHILE INDIVIDUALS WITHIN A POPULATION CAN EXCHANGE GENES, THE TERM "SPECIES" REPRESENTS THE LARGEST UNIT WHERE GENE FLOW IS SIGNIFICANT.

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2. Which of the following structures is incorrectly paired with a tissue?

- a. Haversian system–bone
- b. Platelets–blood
- c. Fibroblasts–skeletal muscle
- d. Basement membrane–epithelium
- e. Cerebral cortex–Neurons
- Answer: C (Fibroblasts–skeletal muscle)
  - Explanation: FIBROBLASTS ARE CONNECTIVE TISSUE CELLS, AND THEY ARE NOT TYPICALLY ASSOCIATED WITH SKELETAL MUSCLE TISSUE. FIBROBLASTS ARE MORE COMMONLY FOUND IN TISSUES LIKE THE DERMIS OF THE SKIN.

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3. The diagram below shows an error in a biological process. What is the process?

- a. Crossing over
- b. Meiosis

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- c. Mitosis

- d. Pleiotropy

- e. Misogyny

- Answer: B (Meiosis)

- Explanation: MEIOSIS INVOLVES THE FORMATION OF GAMETES (SPERM AND EGG CELLS) AND INCLUDES PROCESSES LIKE CROSSING OVER. ERRORS IN MEIOSIS CAN LEAD TO GENETIC ABNORMALITIES.

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4. This biome exhibits the greatest diversity in plant species.

- a. Grassland

- b. Tropical rainforest

- c. Taiga

- d. Tundra

- e. Deciduous forest

- Answer: B (Tropical rainforest)

- Explanation: TROPICAL RAINFORESTS ARE KNOWN FOR THEIR UNPARALLELED BIODIVERSITY, HOSTING A WIDE VARIETY OF PLANT AND ANIMAL SPECIES.

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5. How does DNA differ from RNA?

- a. Two of their nitrogenous bases are different

- b. They contain different sugars

- c. RNA consists of two strands in a double helix, while DNA is single-stranded

- d. All of the nitrogenous bases are different

- e. There is no difference, they are just two abbreviations for the same biochemical

- Answer: B (They contain different sugars)

- Explanation: DNA CONTAINS DEOXYRIBOSE SUGAR, WHILE RNA CONTAINS RIBOSE SUGAR.

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6. Human sex hormones are classified as:

- a. Proteins
- b. Lipids
- c. Triacylglycerols
- d. Amino acids
- e. Oligosaccharides
- Answer: B (Lipids)
- Explanation: HUMAN SEX HORMONES, SUCH AS ESTROGEN AND TESTOSTERONE, BELONG TO THE LIPID (STEROID) CLASS OF MOLECULES.

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7. The Ethiopian scientist who discovered analchol for medical treatment is:

- A. Patrick Habtamu Watson
- B. Getachew Boledian
- C. Pr Yalem Tsehay Mekonen
- D. Dr. Gabbisa Ejeta
- Answer: B (Getachew Boledian)
- Explanation: GETACHEW BOLEDIAN IS CREDITED WITH DISCOVERING ANALCHOL FOR MEDICAL TREATMENT.

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8. _____ was an endocrinologist at the University of Michigan (USA) working with reproductive endocrinology and infertility.

- A. Sebsbe Demsew
- B. Zeresenay Alemseged
- C. Kitaw Ejigu

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- D. Senait Fisseha

- Answer: D (Senait Fisseha)

- Explanation: SENAIT FISSEHA IS KNOWN FOR HER WORK IN REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY AT THE UNIVERSITY OF MICHIGAN.

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9. Which is the first Ethiopian Government Hospital?

- A. Menilik II hospital

- B. Mekdela Amba hospital

- C. Genzebe Dibaba hospital

- D. Tewodros II

- Answer: A (Menilik II hospital)

- Explanation: MENILIK II HOSPITAL IS RECOGNIZED AS THE FIRST ETHIOPIAN GOVERNMENT HOSPITAL.

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10. Who was the first Ethiopian educated as a medical doctor?

- A. Aklilu Lemma

- B. Yalemtsehay Wedajo

- C. Workneh Eshete

- D. Dinberu Thoms

- Answer: C (Workneh Eshete)

- Explanation: WORKNEH ESHETE WAS THE FIRST ETHIOPIAN TO BE EDUCATED AS A MEDICAL DOCTOR.

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11. If humans and panda bears belong to the same class, then they must also belong to the same:

- a. Order

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- b. Phylum

- c. Family

- d. Species

- e. Genus

- Answer: B (Phylum)

- Explanation: IN BIOLOGICAL CLASSIFICATION, ORGANISMS THAT BELONG TO THE SAME CLASS ALSO BELONG TO THE SAME PHYLUM.

12. The direct energy source that drives ATP synthesis during oxidative phosphorylation is:

- a. The oxidation of glucose as well as other organic compounds

- b. The endergonic flow of electrons down the electron transport chain

- c. A difference of H+ concentrations on opposite sides of the inner mitochondrial membrane

- d. The transfer of phosphate to ADP

- e. The formation of cyclic AMP

- Answer: C

- Explanation: DURING OXIDATIVE PHOSPHORYLATION, THE ENERGY FROM THE DIFFERENCE IN H+ CONCENTRATIONS ACROSS THE INNER MITOCHONDRIAL MEMBRANE DRIVES ATP SYNTHESIS.

13. Which of the following is NOT thought to be ancestral to humans?

- a. Primates

- b. Bony fish

- c. Amphibians

- d. Birds

- e. All of the above

- Answer: C (Amphibians)

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- Explanation: HUMANS ARE NOT THOUGHT TO BE DIRECTLY ANCESTRAL TO AMPHIBIANS. THE COMMON ANCESTOR OF HUMANS AND OTHER PRIMATES IS BELIEVED TO BE MORE ANCIENT.

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14. Which of the following is NOT a true statement describing the difference between monocots and dicots?

- a. Vascular bundles scattered in monocot stem, central vascular stele in dicot stem
- b. One cotyledon in monocots, two cotyledons in dicot seeds
- c. Usually only primary growth in monocots, secondary growth in many dicots
- d. Parallel veins in monocots, branching netlike venation in dicot leaves
- e. All of the above
- Answer: A
- Explanation: MONOCOTS TYPICALLY HAVE VASCULAR BUNDLES SCATTERED THROUGHOUT THE STEM, WHILE DICOTS HAVE A CENTRAL ARRANGEMENT.

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15. Which of the following structures is incorrectly paired with a tissue?

- a. Haversian system–bone
- b. Platelets–blood
- c. Fibroblasts–skeletal muscle
- d. Basement membrane–epithelium
- e. Cerebral cortex–Neurons
- Answer: C (Fibroblasts–skeletal muscle)
- Explanation: FIBROBLASTS ARE CONNECTIVE TISSUE CELLS AND ARE NOT TYPICALLY FOUND IN SKELETAL MUSCLE TISSUE

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16. Compared to a smaller cell, a larger cell of the same shape has:

- a. Less surface area per unit of volume

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- b. Less surface area

- c. The same surface-to-volume ratio

- d. A smaller cytoplasm to nucleus ratio

- e. A smaller volume

- Answer: A

- Explanation: AS A CELL GROWS LARGER, ITS SURFACE AREA-TO-VOLUME RATIO DECREASES, MAKING IT LESS EFFICIENT IN NUTRIENT AND WASTE EXCHANGE.

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17. Which of the following enzymes has the lowest pH optimum?

- a. Salivary amylase

- b. Pepsin

- c. Pancreatic amylase

- d. Pancreatic lipase

- e. DNA ligase

- Answer: B (Pepsin)

- Explanation: PEPSIN, AN ENZYME IN THE STOMACH, FUNCTIONS OPTIMALLY AT A LOW PH.

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18. A pea plant had green pods, which is a dominant phenotype. It was determined after a test cross that half the F1 population had green pods, and the other half had yellow pods, which is a recessive phenotype. We can say that the original pea plant was:

- a. Homozygous dominant

- b. Heterozygous

- c. Homozygous recessive

- d. A genetic mutant

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- e. Exhibiting genetic drift

- Answer: B

- Explanation: THE PRESENCE OF BOTH GREEN AND YELLOW PODS IN THE F1 GENERATION SUGGESTS THAT THE ORIGINAL PEA PLANT WAS HETEROZYGOUS.

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19. After the surgical removal of a diseased gallbladder, a patient must be careful to limit their intake of:

- a. Simple carbohydrates

- b. Lipids

- c. Complex carbohydrates

- d. Proteins

- e. Minerals

- Answer: B

- Explanation: THE GALLBLADDER IS INVOLVED IN THE STORAGE AND RELEASE OF BILE, WHICH AIDS IN THE DIGESTION OF LIPIDS.

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20. During the histology laboratory class of the first year of medical school, a student observes the epithelium of human skin, and notices the cells are layered, flat, and scaly. The sample is:

- a. Stratified squamous

- b. Simple squamous

- c. Pseudostratified cuboidal

- d. Stratified columnar

- e. Stratified cuboidal

- Answer: A

- Explanation: THE DESCRIPTION FITS THE CHARACTERISTICS OF STRATIFIED SQUAMOUS EPITHELIUM, WHICH IS FOUND IN THE OUTER LAYER OF THE SKIN.

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21. Of the following physical responses, which is the best example of positive feedback?

- a. Increased blood glucose levels cause the secretion of insulin from the pancreas, which in turn lowers blood glucose levels

- b. A reduced concentration of oxygen in the lungs triggers the production of more red blood cells in order to carry more oxygen.

- c. When a certain nerve cell is stimulated, it causes sodium ions to leak into the cell. The influx of sodium causes even more sodium to then enter the cell as well.

- d. An increased $CO_2$ concentration in the blood induces deeper, more rapid breathing which expels the $CO_2$ from the lungs and, consequently, the blood.

- e. As the core body temperature rises, sweat is released to cool the body via evaporation.

- Answer: C

- Explanation: POSITIVE FEEDBACK AMPLIFIES THE STIMULUS, AND IN THIS CASE, THE STIMULATION OF SODIUM INFLUX LEADS TO AN EVEN GREATER SODIUM ENTRY.

22. Molecular biologists designed a bacteriophage with the protein coat of phage T2 and the DNA of phage T4. If this composite phage is then allowed to infect bacteria, the phages produced in the host cells would be:

- a. The protein of T2 and the DNA of T4

- b. The protein and DNA of T4

- c. The protein of T4 and the DNA of T2

- d. The protein and DNA of T2

- e. The phage will not be able to effectively infect bacteria.

- Answer: B

- Explanation: THE RESULTING PHAGES WOULD CARRY THE GENETIC MATERIAL OF T4 (DNA) AND THE PROTEIN COAT OF T2.

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23. A woman has a colorblind father. However, she is not colorblind. Her husband is also colorblind. The gene for being colorblind is X-linked recessive. What is the probability of their male offspring being colorblind?

- a. 100%
- b. 75%
- c. 50%
- d. 25%
- e. 0%
- Answer: C
- Explanation: THE WOMAN MUST BE A CARRIER (X^CX^C), AND THE PROBABILITY OF PASSING THE COLORBLIND ALLELE TO A MALE OFFSPRING IS 50%.

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24. If humans and panda bears belong to the same class, then they must also belong to the same:

- a. Order
- b. Phylum
- c. Family
- d. Species
- e. Genus
- Answer: B
- Explanation: IN BIOLOGICAL CLASSIFICATION, ORGANISMS THAT BELONG TO THE SAME CLASS ALSO BELONG TO THE SAME PHYLUM.

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25: The systemic circulation of 'oxygenated' and 'deoxygenated' blood is known as

- A) Circulatory system

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- B) Ligament system

- C) Filament system

- D) Cartilage system

- Answer: A

- Explanation: THE SYSTEMIC CIRCULATION INVOLVES THE CIRCULATION OF BLOOD BETWEEN THE HEART AND THE REST OF THE BODY, DELIVERING OXYGENATED BLOOD AND RETURNING DEOXYGENATED BLOOD.

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26: Lymphatic system of the human body is classified as

- A) Filament system

- B) Ligament system

- C) Closed system

- D) Open system

- Answer: D

- Explanation: THE LYMPHATIC SYSTEM IS AN OPEN SYSTEM THAT HELPS MAINTAIN FLUID BALANCE AND TRANSPORTS LYMPH THROUGHOUT THE BODY.

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27: The depletion of blood from the heart in the 'Cardiovascular System' is classified as

- A) Circulatory system of arteries

- B) Circulatory system of lungs

- C) Circulatory system of blood

- D) Circulatory system of lymph

- Answer: B

- Explanation: THE CARDIOVASCULAR SYSTEM INVOLVES THE CIRCULATION OF BLOOD THROUGH THE HEART AND BLOOD VESSELS, INCLUDING THE PULMONARY CIRCULATION IN THE LUNGS.

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28) Glands of Moll are modified

- A) Oil glands
- B) Tear glands
- C) Sweet glands
- D) Scent glands
- Answer: C
- Explanation: GLANDS OF MOLL ARE MODIFIED SWEAT GLANDS FOUND IN THE EYELIDS THAT PRODUCE A SECRETION TO KEEP THE EYES MOIST.

29) The secretion of lacrimal gland is

- A) Watery
- B) Acidic
- C) Oily
- D) Alkaline
- Answer: A
- Explanation: THE LACRIMAL GLAND SECRETES WATERY TEARS THAT HELP KEEP THE EYES LUBRICATED.

30) Colour to the eye is imparted by

- A) Lens
- B) Pupil
- C) Iris
- D) Vitreous humor
- Answer: C

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- Explanation: THE IRIS OF THE EYE CONTROLS THE SIZE OF THE PUPIL, REGULATING THE AMOUNT OF LIGHT ENTERING THE EYE AND CONTRIBUTING TO THE PERCEPTION OF COLOR.

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31. The fertilised egg is known as a before it begins to divide.

- A) Blastocyst
- B) Morula
- C) Trophoblast
- D) Embryo
- E) Zygote
- Answer: E
- Explanation: THE ZYGOTE IS THE FERTILIZED EGG FORMED BY THE FUSION OF SPERM AND EGG BEFORE IT UNDERGOES CELL DIVISION.

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32. What is the tube through which both urine and semen leave a man's body called?

- A) Epididymis
- B) Spermatic cord
- C) Seminiferous tubule
- D) Urethra
- E) Ureter
- Answer: D
- Explanation: THE URETHRA IS THE TUBE THROUGH WHICH BOTH URINE AND SEMEN PASS FROM THE MALE BODY.

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33. If an ovum (egg) is fertilized by a sperm, it usually takes place in the:

- A) Ovary
- B) Fallopian tube (oviduct)
- C) Endometrium
- D) Myometrium
- E) Cervix
- Answer: B
- Explanation: FERTILIZATION TYPICALLY OCCURS IN THE FALLOPIAN TUBES.

34. Which of the following is NOT a physiological function of the placenta during pregnancy?

- A) Exchanging nutrients and waste
- B) Delivery of oxygen
- C) Removal of carbon dioxide
- D) Producing antibodies
- E) Producing hormones
- Answer: D
- Explanation: THE PLACENTA IS NOT PRIMARILY RESPONSIBLE FOR PRODUCING ANTIBODIES; IT FOCUSES ON NUTRIENT EXCHANGE AND HORMONE PRODUCTION.

35. Production of estrogen by the ovaries falls during the perimenopausal period in women because:

- A) The ovaries become increasingly less sensitive to gonadotrophins
- B) Bone remodeling increases
- C) The ovaries become less sensitive to gonadotrophins
- D) The corpus luteum becomes a corpus albicans

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- E) There is a surge of LH from the pituitary gland

- Answer: C

- Explanation: DURING PERIMENOPAUSE, THE OVARIES BECOME LESS SENSITIVE TO GONADOTROPHINS, LEADING TO CHANGES IN HORMONE PRODUCTION.

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36. The size of the pupil decreases due to the contraction of:

- A) Radial muscles

- B) Circular muscles

- C) Both circular and radial muscles

- D) Nictitating membrane

- Answer: B

- Explanation: THE CONTRACTION OF CIRCULAR MUSCLES AROUND THE PUPIL REDUCES ITS SIZE.

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37. Taste buds are located on:

- A) Plate

- B) Tongue only

- C) Pharynx

- D) All the above

- Answer: D

- Explanation: TASTE BUDS ARE FOUND NOT ONLY ON THE TONGUE BUT ALSO ON THE PALATE AND PHARYNX.

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38. Eustachian tube is meant for:

- A) Amplifying sound waves

- B) To listen to activities in the buccopharyngeal cavity

- C) Equalizing pressure on the two sides of the tympanum

- D) To keep the middle ear moist

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- Answer: C

- Explanation: THE EUSTACHIAN TUBE HELPS EQUALIZE PRESSURE ON BOTH SIDES OF THE EARDRUM.

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39. Ventilation (breathing) is a regular, rhythmic process which:

- A) Moves air into and out of the lungs

- B) Releases energy from glucose within living cells

- C) Reduces the surface tension of the lining of the lung

- D) Protects the airways by clearing them of mucus or irritants

- E) Moves gases from an area of high concentration to an area of lower concentration

- Answer: A

- Explanation: VENTILATION INVOLVES THE REGULAR MOVEMENT OF AIR INTO AND OUT OF THE LUNGS TO FACILITATE GAS EXCHANGE.

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40. Which of the following structures is NOT part of the upper respiratory tract?

- A) Larynx

- B) Trachea

- C) Lung

- D) Epiglottis

- E) Pharynx

- Answer: C

- Explanation: THE LUNGS ARE PART OF THE LOWER RESPIRATORY TRACT.

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41. What is the anatomically correct name for the windpipe?

- A) Pharynx
- B) Bronchiole
- C) Larynx
- D) Alveolar duct
- E) Trachea
- Answer: E
- Explanation: THE TRACHEA IS COMMONLY REFERRED TO AS THE WINDPIPE.

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42. Which of the following is the function of the diaphragm in expiration?

- A) Production of energy
- B) Relaxation
- C) Contraction
- D) Gaseous exchange
- E) Helping the lungs to stay inflated
- Answer: B
- Explanation: THE DIAPHRAGM RELAXES DURING EXPIRATION, ALLOWING THE LUNGS TO EXPEL AIR.

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43. Pulmonary surfactant:

- A) Protects the surface of the lungs
- B) Eliminates small particles and dust
- C) Is made by bronchioles
- D) Prevents the alveoli from collapsing
- E) Can change color to green or yellow when infected

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- Answer: D

- Explanation: PULMONARY SURFACTANT REDUCES SURFACE TENSION AND PREVENTS ALVEOLAR COLLAPSE DURING EXPIRATION.

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**THANK YOU!!**

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