

INDIVIDUAL ASSIGNMENT:

HUMAN ANATOMY & PHYSIOLOGY

INSTRUCTIONS:

- a. **Choose ONE (1) topic for each student**; any topics suggest by students are also accepted; students are also recommended to provide their OWN TOPIC based on the selected topic of interest (within syllabus).
- b. Prepare an assignment of 500 (min.) - 1000 words (max.) + diagrams, labels etc.
- c. FRONT COVER: UniSZA logo, Title (+ code of Assignment; eg: A52), Full name, Matric No., Programme & Date of Submission
- d. Font size = 12; 'JUSTIFY' all paragraphs; spacing = 1.5 ; please insert page number.
- e. Margin: Top & bottom = 2.5cm; Left = 3.5cm; Right = 2.0cm
- f. Dateline: **Thursday (Week 14) before 4.00pm; in PDF file & Hardcopy**
- g. Email your PDF assignment to: anatphysiounisza@gmail.com

Prepared by:

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18/11/2018

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LIST OF TOPICS:

- A1.** Explain the impact (advantages & disadvantages) of anatomical & physiological variation among persons.
- A2.** Define positive & negative feedback, give an example (each) and explain its importance to homeostasis.
- A3.** Discuss the way that developments in microscopy have changed our view of cell structure.
- A4.** Describe a second-messenger system and discuss its importance in human physiology.
- A5.** Describe the various mechanisms for transporting material through the plasma membrane.
- A6.** Describe the properties that distinguish epithelium from other tissue classes.
- A7.** Discuss and classify 10 types of connective tissues, describe their cellular components and matrix, and explain what distinguishes them from each other.
- A8.** Discuss the 3 kinds muscular tissue and describe the differences between them.
- A9.** Distinguish the 3 types of hair and describe the histology of a hair and its follicle.
- A10.** Discuss the effects of the integumentary system on other organ systems.
- A11.** Discuss about the 5 zones of metaphysis.
- A12.** Discuss several hormones that regulate bone physiology, describe their effects and further discuss the role of bones in regulating blood calcium and phosphate levels.
- A13.** Discuss the effects of the skeletal system on other organ systems.
- A14.** Discuss the classification of muscles according to fascicle orientation.
- A15.** Discuss the 4 functional groups of muscles (prime mover, synergist, antagonist and fixator).
- A16.** Name the major proteins of a muscle fiber (state the function for each), and relate the striations of muscle fiber to the overlapping arrangement of its filaments.
- A17.** Discuss what a motor unit is and how it relates to muscle contraction/relaxation.
- A18.** Distinguish between isometric-isotonic contraction as well as between concentric-eccentric contraction.
- A19.** Distinguish between 2 physiological types of muscle fibers and explain their functional roles.
- A20.** Describe the structural and physiological differences between skeletal, cardiac and smooth muscles.

- A21.** Discuss the effects of the muscular system on other organ systems.
- A22.** Name the 6 types of cells that aid neurons and state their respective functions (oligodendrocytes, ependymal cells, microglia, astrocytes, Schwann cells & satellite cells).
- A23.** Discuss about myelination process and regeneration of nerve fibers.
- A24.** Discuss about the saltatory conduction in a myelinated neuron.
- A25.** Discuss the effects of the nervous system on other organ systems.
- A26.** Discuss the role of hair cells during hearing and body balance.
- A27.** Describe the 4 types of lingual papillae and explain how taste (gustation) is stimulated.
- A28.** Discuss the mechanism of generating visual signals through rods and cones.
- A29.** Discuss the detail mechanism of olfaction.
- A30.** Describe the differences between sympathetic and parasympathetic system.
- A31.** Write a summary of all bones of the skull.
- A32.** Calcium homeostasis & its physiological impact in human body system.
- A33.** Role of sweat gland in thermoregulation & body behaviour.
- A34.** Discuss the differences between WAT and BAT.
- A35.** Write a summary of bones, muscles, nerves and vascular of the upper limb.
- A36.** The principles of osteogenesis.
- A37.** Write a summary of bones, muscles, nerves and vascular of the lower limb.
- A38.** Types of muscle fibres (SO & FG).
- A39.** Discuss the principles of skeletal, cardiac and smooth muscle contraction & relaxation.
- A40.** Write a summary of origin, insertion and function of muscles of the lower limb.
- A41.** Explain the physiology of myelination in CNS & PNS.
- A42.** Discuss about the anatomy & role of spinal cord in nerve transmission to the brain.
- A43.** Summarize the transmembrane potentials of sympathetic and parasympathetic.
- A44.** Discuss the gross anatomy of the ear and its relationship in physiology of hearing and body balance.
- A45.** Discuss the gross anatomy of the eye and its relationship in physiology of sight.
- A46.** Discuss the life cycle of an erythrocyte and the role of endocrine in hematopoiesis.

- A47.** Explain about the cardiac conducting system and its role in pacemaker activity of the heart.
- A48.** Discuss the important of ECG in maintaining the cardiac rhythm.
- A49.** Explain the structure & function of important lymphatic organs.
- A50.** Write a summary of activation and clonal selection of B & T cells.
- A51.** Discuss the principles of phagocytosis, inflammation and complement system.
- A52.** Discuss about the partial gas pressure and the impact of Bohr & Haldane effect in breathing.
- A53.** Explain the 6 general function of digestive system and the mechanism that regulate the entire GIT.
- A54.** Discuss the physiology of mastication and deglutition.
- A55.** Summarize the 5 components of gastric juice and discuss about the mechanical and chemical digestion within the gaster.
- A56.** Discuss the origin of bile and the physiology of fat emulsification & absorption within the small intestine.
- A57.** Discuss the mechanical & chemical digestion of the small intestine.
- A58.** Explain the gross anatomy and the physiology of pancreatic enzymes in digestion.
- A59.** Write a short note about the hepar.
- A60.** Discuss the mechanical & chemical digestion of the large intestine and explain the mechanism of defecation reflex.
- A61.** Discuss about the role of kidney in regulating [NaCl] within the body.
- A62.** Discuss the role of RAAS and highlight the physiology of micturition.
- A63.** Discuss the origin, chemical structure and mechanism of action of all hormones of the hypothalamus.
- A64.** Discuss the origin, chemical structure and mechanism of action of all hormones of the pituitary gland.
- A65.** Discuss about the role of melatonin in REM.
- A66.** Highlight the structure of thyroid & parathyroid and compare the origin and the mechanism of action of thyroid hormones.
- A67.** Discuss the origin, chemical structure and mechanism of action of all hormones of the liver.
- A68.** Discuss the origin, chemical structure and mechanism of action of all hormones of the digestive system.

- A69.** Discuss the origin, chemical structure and mechanism of action of estrogen.
- A70.** Discuss the origin, chemical structure and mechanism of action of all hormones of the pancreas, renal and adrenal glands.
- A71.** Highlight the gross anatomy of male reproductive organs and the principles of descent of testis into the scrotum.
- A72.** Discuss the principles of spermatogenesis, spermiogenesis, spermiation and capacitation.
- A73.** Discuss about the physiology of semen, penis erection and ejaculation.
- A74.** Highlight the gross anatomy of female reproductive organs and the principles of ovarian and menstrual cycle.
- A75.** Discuss the physiology/principles of sperm recognition and migration towards normal fertilization.
- A76.** Discuss about the development of placenta and its role during pregnancy until birth.
- A77.** Discuss about the mechanism of breathing and the components that control ventilation.
- A78.** Discuss the effects of the endocrine system on other organ systems.
- A79.** Discuss the effects of the circulatory system on other organ systems.
- A80.** Discuss the effects of the immune & lymphatic system on other organ systems.
- A81.** Discuss the effects of the respiratory system on other organ systems.
- A82.** Discuss the effects of the urinary system on other organ systems.
- A83.** Discuss the effects of the digestive system on other organ systems.
- A84.** Discuss the effects of the reproductive system on other organ systems.
- A85.** Write an overview of the secretion process for protein synthesized by the ER & detoxification process by the peroxisomes.
- A86.** Mitochondria play a major role in generating ATP.
- A87.** Membrane permeability & transportation across the cell membrane.
- A88.** Write a summary about the anatomy & physiology of the human brain.
- A89.** Explain the early development embryology and throughout the entire process of pregnancy.
- A90.** Discuss the muscles & joints that support the spine & the relationship with the slipped disc.

- A91.** Discuss the importance of water and electrolytes in the human body and the impact of blood-brain barrier (BBB).
- A92.** Discuss the importance of the skin and the wound healing caused by skin burn.
- A93.** Physiology of eye accommodation & the importance of eye refractive power.
- A94.** Discuss the role of melatonin, types of brain wave & circadian rhythm.
- A95.** Structure of neuron, types of Glial cells & regeneration of nerve fibers.
- A96.** Role of neurotransmitter in adrenergic & cholinergic pathways.
- A97.** The importance of memorization.
- A98.** The spinal cord & spinal tracts.
- A99.** The nature of reflexes.
- A100.** The cranial nerve pathways.
- A101.** Neurogenesis: How to produce more brain cells.
- A102.** The role of neurotransmitters of the CNS.
- A103.** The relationship between IQ, EQ, SQ, AQ and CQ of the brain's function.
- A104.** The neuroglia and its association with the nervous system.
- A105.** Origin & Composition of Cochlear Fluids

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