



Examination for February Semester
MD Degree
Physiology of The Eye

Time allowed: 3 hours
Total marks: 45 marks
All questions to be attempted

A) What is the Physiological basis of the following:

(3 questions, 5 marks for each questions)

1. Light falling on the retina is absorbed by the visual pigments of the rods and cones and initiate photochemical changes: Discuss photochemistry of vision.
2. Corneal transparency is the result of physical, anatomical and physiological factors: Discuss factors affecting corneal transparency.
3. Accommodation is a process by which the eye can change its refractive power to see objects clearly at different distances: Discuss theories, ocular changes and age-related changes of accommodation.

B) MCQ: Choose only one answer:


(15 questions, 2 marks for each question)

- 1) The following is present in higher concentration in the tear than in the serum:
 - a) Sodium
 - b) Potassium
 - c) IgG
 - d) Glucose

- 2) **The following fact is true about human tears:**
- a) The pH of tears is 6.0
 - b) The pH of tears is 7.4
 - c) Tears do not contain ammonia
 - d) Tears do not contain albumin
- 3) **Glucose metabolism in the lens principally occurs by:**
- a) Anaerobic glycolysis
 - b) Aerobic metabolism
 - c) Hexose monophosphate shunt
 - d) Sorbitol pathway
- 4) **When produced, aqueous humor passes out through the membranes of:**
- a) Trabecular meshwork
 - b) Corneal endothelial cells
 - c) Non-pigmented cells of the ciliary body
 - d) Pigmented cells of the ciliary body
- 5) **The principle of IOP measurement is defined by:**
- a) Schwalbe's equation
 - b) Poiseuille's law
 - c) Imbert-Fick principle
 - d) Holladay's equation
- 6) **In near reflex, the shortest duration occurs with:**
- a) Far to near accommodation
 - b) Near to far accommodation
 - c) Reflex miosis
 - d) Convergence response
- 7) **Which statement is TRUE regarding (tonic pupil)**
- a) It is a postganglionic sympathetic denervation of intraocular muscles
 - b) Constitutes poor reaction to light, strong reaction to near (light-near dissociation)
 - c) Less sensitivity to diluted pilocarpine (0.125%)
 - d) The tonic pupil appears smaller than the pupil of unaffected eye.
- 8) **In Consensual light reflex, light stimulation of one retina produces pupillary contraction in opposite eye due to**
- a) Partial decussation of optic nerve fibers at the chiasm
 - b) Partial decussation of optic nerve fibers in the midbrain
 - c) Double decussation of pupillary fibers at chiasm and midbrain
 - d) Supranuclear control of Edinger-Westphal nucleus

- 9) **Saccadic-type eye movements are initiated by:**
- a) The oculomotor cerebellar center
 - b) Abducent nerve nucleus
 - c) Trochlear nerve nucleus
 - d) The temporal cortex
- 10) **A number of corresponding points on the retina that projects to a definite single point in space is known as:**
- a) The Auberg phenomenon
 - b) A horopter
 - c) Panum's area
 - d) The Pulfrich phenomenon
- 11) **Which is the minimum threshold of Vernier hyperacuity?**
- a) 1 second of arc
 - b) 10 seconds of arc
 - c) 20 seconds of arc
 - d) 1 minute of arc
- 12) **All of the following are true about amino acids content of the lens except:**
- a) Lens contains all types of amino acids
 - b) Concentration of amino acids are higher than vitreous
 - c) Not affected by aging, fasting or feeding protein-free diet
 - d) Actively transported inside the lens by lens epithelium
- 13) **Which of the following statements about color discrimination is TRUE?**
- a) It is poorest at long wavelengths
 - b) It is affected by the distribution of rods
 - c) It is best for short wavelength
 - d) It is maximal at the fovea
- 14) **Which of the following methods can be used to isolate a cone response from the electroretinogram?**
- a) Dim background lightening conditions.
 - b) 50-Hz flicker
 - c) 10- Hz flicker
 - d) Single flash ERG
- 15) **Regarding VEP, which of the following statements is NOT accurate?**
- a) VEPs are a measure of the response of the occipital cortex to visual stimulation
 - b) VEPs can be used to assess crossover of visual pathway fibers at optic chiasma
 - c) An amblyopic eye will usually have an abnormal pattern and flash VEP
 - d) VEPs can be used to approximate the visual acuity

-- Good Luck --

<p>Tanta University Faculty of Medicine Anesthesia Department. Date: 23-2-2022.</p>	<p>Exam: 1st part of MD (Physiology) No. of Questions: 4 Time allowed: 3 hours Total marks: 45</p>	
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Question 1. The primary functions of the cardio-pulmonary systems are delivery of O₂ and nutrients to tissue and elimination of CO₂ and waste of metabolites from it. (15marks)

A. Define functional residual capacity (FRC) and closing volume (CV). Discuss their changes in an elderly patient undergoing upper abdominal surgery? (3marks)

B. Draw flow-volume loops in normal/obstructive / and restrictive lung disease? (2marks)

C. Mention the formula of pulmonary vascular resistance? Draw the relation between pulmonary vascular resistance and lung volumes? What are the factors affecting pulmonary vascular resistance? (3marks)

D. What are the factors that determine oxygen delivery? Describe the critical oxygen delivery in normal and patients with heart failure, anemia, and multi-organ dysfunction? (3marks)

E. Describe Frank-Starling curve in normal, use of inotrope, and patients with heart failure? Describe overlapping Frank-Starling curve and extravascular lung water curve in normal and patients with sepsis? (4marks)

Question 2. Homeostasis is the ability of the body to maintain its environment within the physiological functions including but not limited to prevention of intravascular thrombosis. (10 marks)

A. Outline the physiological basis of the coagulation. (3marks)

B. Describe the process of fibrinolysis. (3marks)

C. Explain with examples the increased risk of perioperative venous thromboembolism. (2 marks)