



Tanta University, Faculty of Medicine,  
Department of Ophthalmology  
Diploma Degree (MSc) Examination  
Ocular Physiology  
August, 2019

**All questions to be answered**  
**Exam Duration ( 3 ) hours**

1. Discuss pathophysiology of tear film dysfunction and tests for tear film adequacy 5 degrees
2. Give an account on theories of accommodation and their clinical applications 5 degrees
3. Discuss the role of entoptic phenomenon in diagnosis of retinal diseases 5 degrees

**Multiple choice questions: Choose only one answer**  
**(15 degrees, one degree for each question)**

1. Which one of the following is NOT associated with a decrease in hyaluronate concentration in the vitreous :
  - a. Vitreous hemorrhage
  - b. Diabetes
  - c. Hyperopia
  - d. Aphakia
2. Which statement concerning visual acuity is TRUE?
  - a. It is a measure of the sensitivity of the retina to light
  - b. It is greater in a person with 0.5 vision than in one with 0.75
  - c. It is greater using central than using peripheral vision
  - d. It is greater in normal than in color-blind people
3. All of the following mechanisms help to increase the amount of drug absorption of an eye drop EXCEPT:
  - a. Increasing hydrophilicity of the drug
  - b. Decreasing nasolacrimal pumping
  - c. Decreasing the washout by another drop
  - d. Increasing lipid solubility to facilitate corneal penetration



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4. The Uhthoff's phenomenon describes:
  - a. Inability to distinguish faces
  - b. Decrease in vision when the body is overheated
  - c. Skew eye movements
  - d. A decrease of vision with neck flexion
  
5. Which statement concerning the cornea is FALSE:
  - a. Oxygen for nourishment of epithelial cells is provided by the tear film
  - b. Bowman's membrane is true basement membrane secreted by the basal epithelial cells
  - c. Endothelial cells actively pump water into the aqueous for corneal deturgescence
  - d. Descemet's membrane consists of two layers: a fetal banded layer and adult unbanded layer
  
6. Which statement is TRUE? When light is shone into one eye, the pupil
  - a. constricts even though its optic nerve has been totally damaged
  - b. responds due to sympathetic nerve activity
  - c. does not respond if autonomic cholinergic nerves are blocked by local application of atropine
  - d. in that eye constricts and in the opposite eye dilates
  
7. On entering a darkened room, which statement is TRUE:
  - a. Threshold light intensity for the eye starts to rise
  - b. Adaptation of vision is complete after 2-3 minutes
  - c. Time course for pupillary dilatation is similar to that for dark adaptation
  - d. First phase of retinal adaptation is mainly in the cones
  
8. Regarding the blood aqueous barrier, all of the following is true EXCEPT:
  - a. Formed mainly by zonula occludens (tight junctions) at apical portions of pigmented epithelial cells
  - b. It helps maintain the osmotic and electrical gradient across the ciliary epithelium
  - c. Phospholipids are present in lower concentration in aqueous than in plasma because they do not pass the blood-aqueous barrier
  - d. The albumen/globulin ratio is higher in aqueous than in plasma because it blocks passage of high-molecular proteins



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9. All of the following concerning carbonic anhydrase inhibitors (CAIs) are true EXCEPT:
- CAIs inhibit isoenzyme CA-IV which is predominant in the ciliary epithelium
  - Formation of aqueous is directly linked to secretion of bicarbonate into the interepithelial space.
  - IOP-lowering effect may be related to  $H^+$  released after catalysis of  $CO_2$  &  $H_2O$
  - Topical CAIs has high corneal penetration through a biphasic lipid/water solubility
10. In cortical cataract, there is:
- Decreased protein content, with decrease in water insoluble fraction
  - Decreased protein content, with increase in water insoluble fraction
  - Increased protein content, with increase in water insoluble fraction
  - Increased protein content, with decrease in water insoluble fraction
11. Cocaine is a sympathomimetic drug which dilates the pupil through:
- Direct stimulation of alpha receptors on effector cells
  - Direct stimulation of beta receptors on effector cells
  - Prevention of reuptake of norepinephrine back to the nerve endings
  - Release of norepinephrine from nerve endings
12. One of the most important functions of the RPE is phagocytosis of the outer segments of the photoreceptors. How long does it take for a photoreceptor to regenerate its outer segment?
- One hour
  - One day
  - Ten days
  - One hundred days
13. During caloric testing, cold water is irrigated in the right ear. Which direction will be the fast phase of nystagmus?
- Up
  - Down
  - Right
  - Left
14. Which of the following statements regarding ERG is NOT accurate?
- Pattern ERG represents activity of retinal ganglion cells



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- b. The PSD component is always affected in macular diseases
- c. The N95 component corresponds to ganglion cell activity
- d. Pattern ERG is always affected in optic nerve diseases

15. A junctional scotoma in the visual field due to lesion at junction of optic nerve and chiasm comprises

- a. A centrocecal scotoma in both eyes
- b. A centrocecal scotoma in ipsilateral eye and upper temporal field defect in contralateral eye
- c. A centrocecal scotoma in ipsilateral eye and a hemianopic field defect in the contralateral eye
- d. A centrocecal scotoma in ipsilateral eye and upper nasal field defect in the contralateral eye