



*(University of Choice)*  
**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS  
2022/2023 ACADEMIC YEAR**

**MAIN EXAM**

**FOR THE DEGREE  
OF  
BACHELOR OF OPTOMETRY AND VISION SCIENCE**

**COURSE CODE: BOV 323**

**COURSE TITLE: Neuro Eye Diseases and Glaucoma**

**DATE: 11/4/2023      TIME: 3.00-5.00 PM**

---

**INSTRUCTIONS TO CANDIDATES**

**Answer all questions**

**TIME: 2 Hours**

MMUST observes ZERO tolerance to examination cheating

## SECTION A

1. A 30-year-old female complains of continuous quivering of the upper and lower lids around her right eye over the last 2 weeks. On examination, there is a continuous undulation in the right orbicularis oculi that trails off into adjacent facial muscles. There is also an asymmetrically prominent nasolabial fold on the right, and her palpebral fissure is narrower on the right side than on the left. She has no facial weakness. Ophthalmoscopy reveals that the patient has bilateral temporal pallor and nerve fibre thinning in both eyes. Her saccadic eye movements show mild adduction slowing with abductor overshoot. What is the most likely diagnosis?
  - A. Multiple sclerosis
  - B. Mitochondrial myopathy
  - C. Guillain-Barre syndrome
  - D. Brainstem glioma
2. Compared to patients who have optic neuritis, patients with neuroretinitis are at low risk for developing which of the following conditions?
  - A. Optic disc swelling associated with exudates
  - B. Multiple sclerosis
  - C. Lyme disease
  - D. Permanent vision loss
3. A 62-year-old diabetic and hypertensive male wakes the day after cardiac bypass graft and notices that the vision in his left eye is blurry. That evening his right eye becomes similarly affected. On examination, vision is 20/40 OD and 20/60 OS. No afferent defect is detected. However, there are bilateral inferior altitudinal visual field defects, and both optic discs are swollen superiorly with splinter haemorrhages. Which test or mechanism best characterizes this disorder?
  - A. The patient's erythrocyte sedimentation rate (ESR) of 87 on the second postoperative day is probably a result of temporal arteritis.
  - B. The patient probably experienced blood loss and periods of hypotension during the operation.
  - C. The absence of relative afferent pupillary defect means that vision loss is likely due to a vitreous haemorrhage.

D. Visual loss is related to embolic occlusion in the posterior ciliary circulations

4. A 32-year-old man presented with a week's history of right ptosis and ear pain. Examination revealed a 2 mm ptosis of the right upper lid and he continued to describe significant ear pain. He had already received a 1-week course of oral antibiotics. In the light, his right pupil measured 2 mm and his left measured 3 mm, and in a dimly lit room his right pupil measured 2.5 mm and the left measured 4 mm. What is the most likely cause of the anisocoria?
- A. Argyll Robertson pupil
  - B. Damage to oculosympathetic system
  - C. Longstanding Adie pupil
  - D. Physiological anisocoria
5. A 60-year-old man has intermittent binocular horizontal diplopia. Physical examination reveals impaired adduction of the left eye with an abducting nystagmus of the right eye. Where is the location of the single lesion that explains the finding?
- A. Right medial longitudinal fasciculus
  - B. Left third-nerve fascicle
  - C. Left medial longitudinal fasciculus
  - D. Right sixth-nerve fascicle
6. A 64-year-old woman reports the progressive onset of ptosis and diplopia over an 8-month period. On examination, the left eye is normal, but the right eye reveals the following abnormalities: 4 mm of ptosis, limitation of eye movement in all directions, 4 mm pupil that does not react to light or dilate in darkness, and loss of corneal sensation. What is the most likely diagnosis?
- A. Graves' ophthalmopathy
  - B. Myasthenia gravis
  - C. Intracavernous meningioma
  - D. Aneurysm of the posterior communicating artery

7. A 7-year-old boy who is slow in school and is being placed in special education is referred by a paediatrician for evaluation of his visual status. The child has had three seizures, and a raised papular rash in a butterfly distribution has been noted on his cheeks. Some patchy hypopigmented areas are also seen on the trunk. The child is otherwise well. What is the most likely diagnosis?
- A. Juvenile-onset systemic lupus erythematosus with cerebritis
  - B. Tuberous sclerosis (Bourneville's disease)
  - C. Neurofibromatosis type I (Von Recklinghausen's disease)
  - D. Encephalotrigeminal angiomas (Sturge-Weber syndrome)
8. Which of the following findings would be unusual in a patient presenting for an examination before craniotomy for a large pineal tumour?
- A. Convergence-retraction nystagmus only on attempted saccades downward
  - B. Skew deviation
  - C. Light-near dissociation of the pupils
  - D. Lid retraction
9. A 67-year-old Asian man consulted an optometrist 3 months ago with an isolated right sixth-nerve palsy that had been present for 3 months. His CT scan with contrast of the head, edrophonium (Tensilon) test, glucose tolerance test, sedimentation rate and serologies for Lyme disease and syphilis were normal. He now presents with a left sixth-nerve palsy to accompany the persistent right sixth-nerve palsy. The results of the rest of the examination remain normal. There is no proptosis. A spinal tap performed by his neurologist 1 day earlier was normal. What is the location of the pathologic process?
- A. Genu of right facial nerve around abducens nucleus
  - B. Both orbital apices
  - C. Clivus
  - D. Bilateral abducens nucleus

13. Which of the following syndromes best describes ipsilateral sixth and seventh nerve palsies with contralateral hemiparesis?

- A. Eight-and-a-half syndrome
- B. Foville syndrome
- C. Millard–Gubler syndrome
- D. Raymond-Céstan syndrome

14. A patient presents with facial weakness, diplopia, ataxia, and areflexia. Which of the following is the most likely cause?

- A. Miller Fisher syndrome
- B. Ramsay Hunt syndrome
- C. Melkersson-Rosenthal syndrome
- D. a cerebellopontine angle tumor

15. A patient presents with continuous unilateral undulating contraction of the orbicularis oculi and most of the facial muscles. Which of the following is the most likely cause?

- A. vascular compression of the seventh nerve
- B. pontine glioma
- C. excessive caffeine intake
- D. aberrant regeneration from prior Bell palsy

16. A 45-year-old man presents with several episodes per day of severe left sided orbital and temporal pain lasting 5-10 minutes and occasionally associated with left ptosis and miosis. Which of the following is the most likely diagnosis?

- A. cluster headache
- B. paroxysmal hemicrania
- C. hemicrania continua
- D. idiopathic stabbing headache

10. A 59-year-old woman reports inability to see road signs when driving and has had 3 minor collisions in the past 6 months. Spontaneous, rapid conjugate eye movements occur in short bursts both vertically and horizontally. Her systemic diseases (hypertension, hyperlipidemia) are under good control, although she has been unable to stop smoking cigarettes. Where would a mass lesion be most likely present?

- A. frontal lobe of brain
- B. lower pole of right kidney
- C. iliac crest bone marrow
- D. middle lobe of lung

11. A 24-year-old woman has had intermittent blurred vision for the past 3 months. Visual acuity is 20/30 in each eye with full fields and normal fundus appearance. You observe a low-amplitude, moderate-frequency, right-beating horizontal jerk nystagmus. After documenting your findings, you now observe a left-beating jerk nystagmus. What findings would you expect on magnetic resonance imaging of the brain?

- A. periventricular white matter lesions on FLAIR sequences
- B. empty sella and chiasmal Displacement on sagittal T1 sequences
- C. pineal gland enlargement with coronal T1 contrast enhancement
- D. clival tumor with midbrain compression on axial T1 contrast-enhanced images

12. Where is the central lesion located that can cause bilateral light- near dissociation of the pupils?

- A. dorsal midbrain
- B. nucleus of Budge-Waller in the upper spinal cord
- C. hypothalamus
- D. occipital lobe

17. A patient receiving prophylactic migraine treatment experiences blurred vision associated with pain. Which of the following is the most likely migraine drug used by the patient?

- A. gabapentin
- B. naproxen
- C. topiramate
- D. verapamil

18. Which of the following clinical findings is most likely to suggest the need for additional diagnostic testing in a patient with migraine headache?

- A. absence of family history
- B. presence of a visual aura with hemianopic distribution
- C. presence of a visual field defect
- D. pulsating character of headache

19. When the clinician suspects a nonorganic loss of vision in a patient who claims to see nothing, which of the following test results may be helpful in establishing the presence of some vision?

- A. The eyes do not move during a mirror test.
- B. Proprioceptive testing results are normal.
- C. The eyes move with rotation of an optokinetic nystagmus drum.
- D. There is a normal pupillary reaction to bright light.

20. In a patient with a fixed, dilated pupil, which test result best helps identify a pharmacologic blockade as opposed to a third nerve palsy or Adie tonic pupil?

- A. normal pupillary light response in the fellow eye
- B. minimal pupillary constriction after 0.125% pilocarpine
- C. rapid pupillary constriction after 10% phenylephrine
- D. absent pupillary constriction after 1% pilocarpine

## SECTION B

1. A 70-year-old male has been having a problem with sleep for a very long time, he is currently on melatonin and has a complaint of severe headache, on examination the clinician noticed that the patient had a dilated eye that is not reactive to light, what could be the problem, what are other presentations of the condition and why was the eye not reactive to light, illustrated with a well-labeled diagram? (3 marks)
2. A 54-year-old man examined by an ophthalmologist was found to have a bitemporal hemianopia. Radiologic and biochemical examinations showed the pituitary gland to be of normal size and function. Can you name any other anatomic structure that, if enlarged, might press on the optic chiasma? (1 mark)
3. A 65-year-old man with hypertension was admitted to a hospital with a left middle cerebral artery infarction. The patient's eyes were deviated to the left and there was spastic hemiparesis on the right side, especially his right arm. He had a lower right quadrant facial weakness. On his recovering consciousness, the patient was found to have a right-sided homonymous hemianopia. Explain why the patient deviated his eyes to the left. Which part of the visual pathway was probably involved to produce a right-sided homonymous hemianopia? Would the patient have normal pupillary reflexes? (1 mark)
4. A 45-year-old man presented with the classic signs of acromegaly—enlarged, broad, spade-like hands, large feet, and protruding jaws. The patient complained of bitemporal headache that was associated with boring pain behind the eyes. Three days previously, he had noticed an impairment in vision. On attempting to cross the road he was nearly knocked down by a cyclist. A CT scan revealed a large tumour occupying the Sella turcica and extending superiorly toward the third ventricle. Explain the boring pain behind his eyes. What might be responsible for his impairment in vision and the near accident involving the cyclist? (1 mark)
5. Which syndrome includes cranial nerve III palsy, contralateral decreased sensation, and contralateral tremor in the extremities? (1 mark) with a well-labelled diagram show the location of the lesion in the midbrain. (1 mark)
6. Which cranial nerve is traumatized most commonly with a closed head injury? and why? (2 marks)



QUESTIONS 7–10 Select the answer below that corresponds to the finding indicated. (4marks)

- A) Diabetic cranial nerve III palsy
- B) Aneurysm
- C) Both
- D) Neither

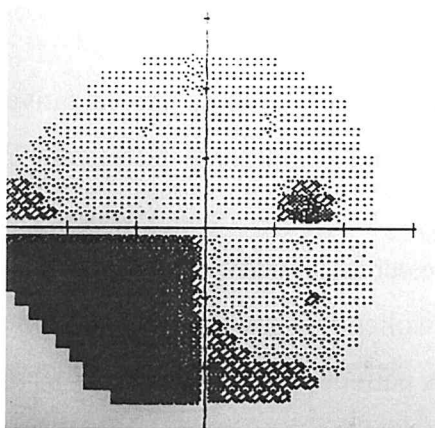
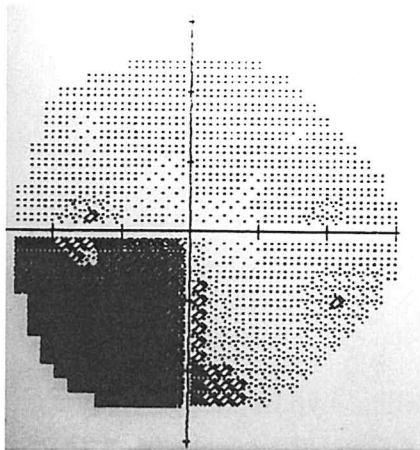
7. Pupil commonly involved

8. Painful cranial nerve III palsy

9. Spontaneous resolution

10. Inability to abduct or adduct eye

11. A 74-year-old man developed difficulty reading and mild left-arm weakness yesterday. Visual acuity is 20/20 OU, and his visual fields are shown below. State any other symptom? (1 marks)



12. A patient presents with irritation and conjunctival injection of the right eye. You find right orbicularis weakness, decreased ability to wrinkle the right forehead, slight right corneal anesthesia, and a small angle esodeviation develops on right gaze. What test would be most helpful? And why? (3marks)

QUESTIONS 13–17 Select the answer below that corresponds to the finding indicated. (4 marks)

- i. First-order Horner's
- ii. Second-order Horner's
- iii. Third-order Horner's
- iv. All of the above

13.No dilation of the pupil after instillation of cocaine 10%

14.No dilation of the pupil after instillation of hydroxyamphetamine 1% (Paredrine)

15.Affected pupil is smaller

16. Carotid dissection

17. Pancoast tumor

QUESTIONS 18 and 19 You see a patient in the ICU after cardiac bypass surgery. His right pupil is dilated and unreactive to light. You swing a light back and forth between his eyes.

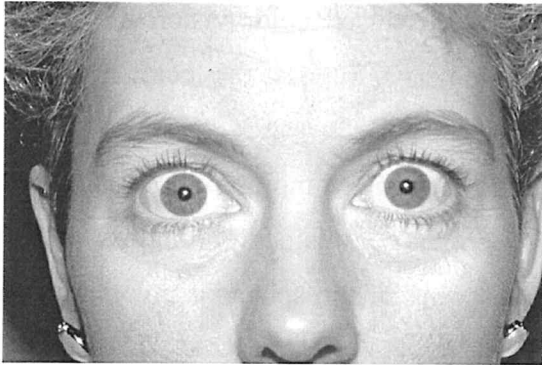
18. What would be observed if he has a right APD? (1 mark)

19. No APD is present. The ocular examination is unremarkable. What is the tentative diagnosis? Which drop placed in both eyes would provide the most additional information? (1marks)

20. A 44-year-old black woman noticed a change in vision yesterday. Today, visual acuity is 20/20 OD and 20/200 OS. There is a left relative APD and a swollen left optic nerve head. The remainder of the examination is normal. Additionally, she notes pain on eye movement. What is the best next step? And why? (2marks)

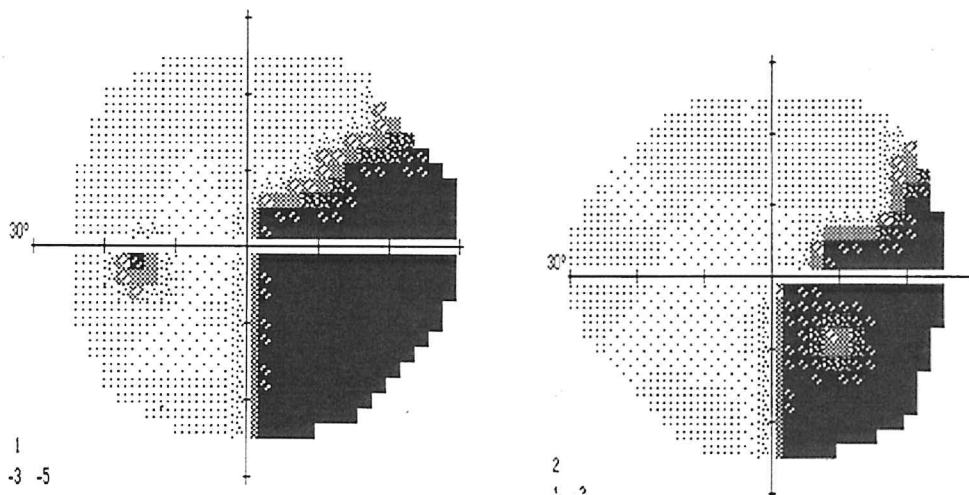
21. A 72-year-old woman experienced three 10- to 15-minute episodes of “blurred vision” in the right eye over the past week. Her eye examination is normal. The presence of which signs should elicit the most prompt attention to prevent permanent visual loss? (1marks)

A 28-year-old woman developed diplopia on upgaze (Figure below). MRI of the brain was normal.



22. She was found to be hyperthyroid and was treated with radioactive iodine. Subsequently, she became hypothyroid and was treated with levothyroxine sodium (Synthroid). Now, 6 months later, she develops bilateral conjunctival injection and a right relative APD. What is the most appropriate next step in management? (1 marks)

23. A 29-year-old woman has had “migraine” headaches for several years. She recently developed episodes of “flashing lights off to the right” that affect her peripheral vision. Her automated perimetry is shown in Figures Below. The next step would be (1marks)



24. A 68-year-old man developed a sudden onset of vomiting, imbalance, and double vision. On examination, he had a concomitant 10 PD left hypertropia and ataxia. What test should be ordered? and why (2 marks)

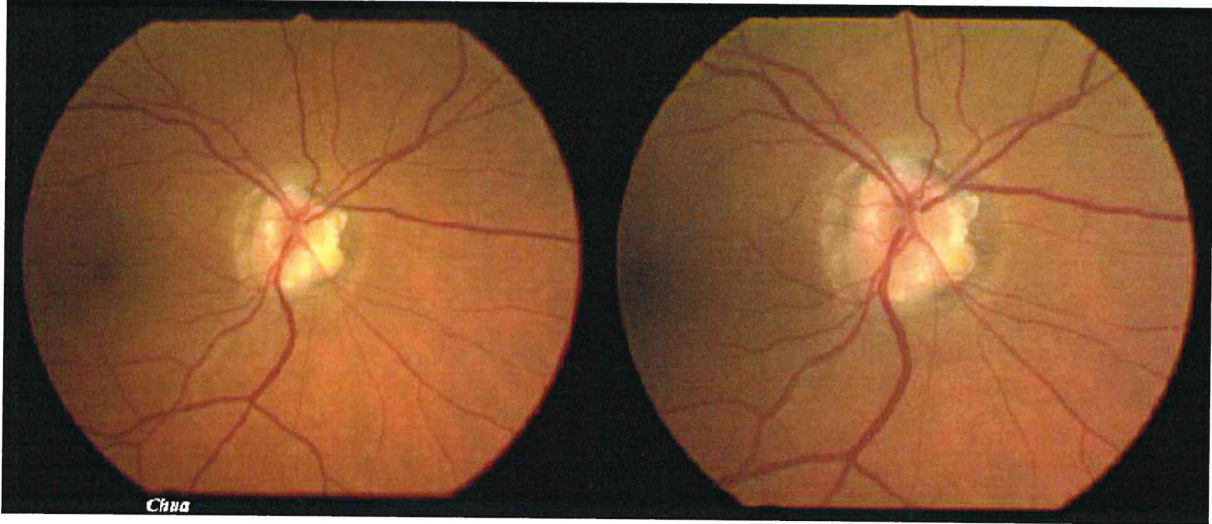
25. An 8-year-old girl with von Recklinghausen's disease was noted to have subnormal vision in her right eye during a routine screening examination by her school nurse. An ophthalmic examination revealed severe loss of vision in the right eye, reduced color vision, moderate proptosis of the right eye, and papilledema of the right optic nerve. Suggest the location of this child's lesion (2 marks)

26. A 28-year-old man suffered severe head and neck injuries during a motor vehicle accident. When he regained consciousness in the emergency department, he complained of blindness in his right eye. A CT scan demonstrated a fracture of the lesser wing of the sphenoid involving the optic canal. Explain the blindness that followed this injury? (2 marks)

27. A 58-year-old man who had suffered from chronic sinusitis for many years was seen by an otolaryngologist. After an extensive workup it was decided to operate on his sphenoidal air sinuses to improve the drainage. After the operation, the patient complained that he could not see with his right eye. Using your knowledge of anatomy, explain how this serious complication could occur. (2 marks)

28. Following a bicycle accident, an 18-year-old girl was diagnosed as having a blow out fracture of her right maxilla, resulting in diplopia and right-sided enophthalmos. During the surgical procedure to restore the bony fragments of the floor of the right orbit, the facial and ophthalmic surgeons discussed the boundaries of the maxillary sinus. Using your knowledge of anatomy, describe the bones that form the walls of the maxillary sinus. (2 marks)

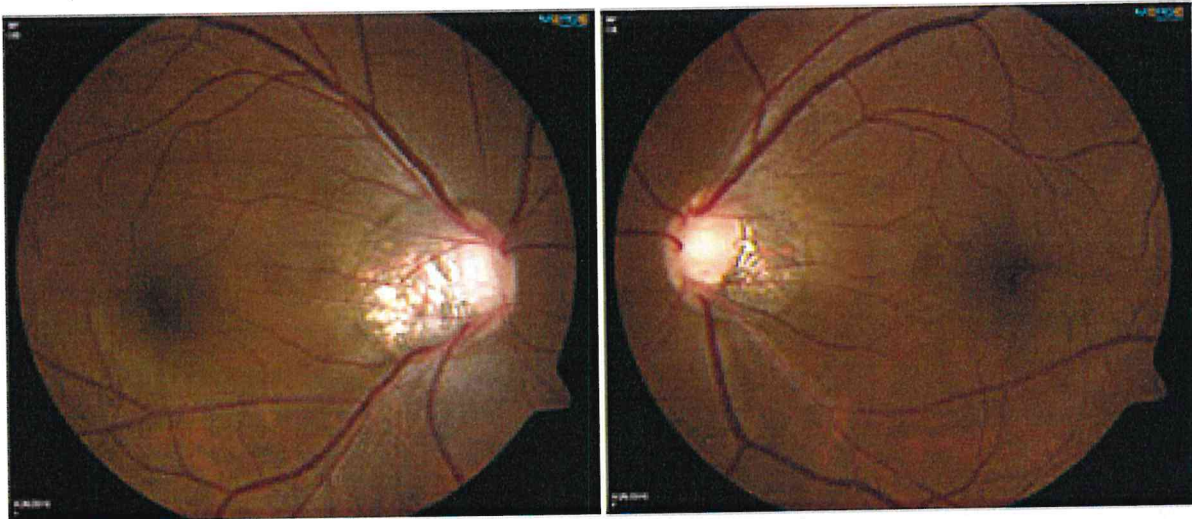
A 15-year-old come to the clinic for eye examination upon examination the disc looks like below



29. What is the diagnosis above? And why? (2 marks)

30. Assuming the father and the mother were diagnosed with glaucoma, what could be the management of the above patient? (3marks)

A 20-year-old black man visited the optometry clinic for a change in glasses, the patient previous prescription was -4.50Ds both eyes, on checking the disc the disc appears like below?



31. What would be the next logical step to take? (1 mark)

32. Does the presentation of the disc warrant glaucoma workup or not and why? (3marks)

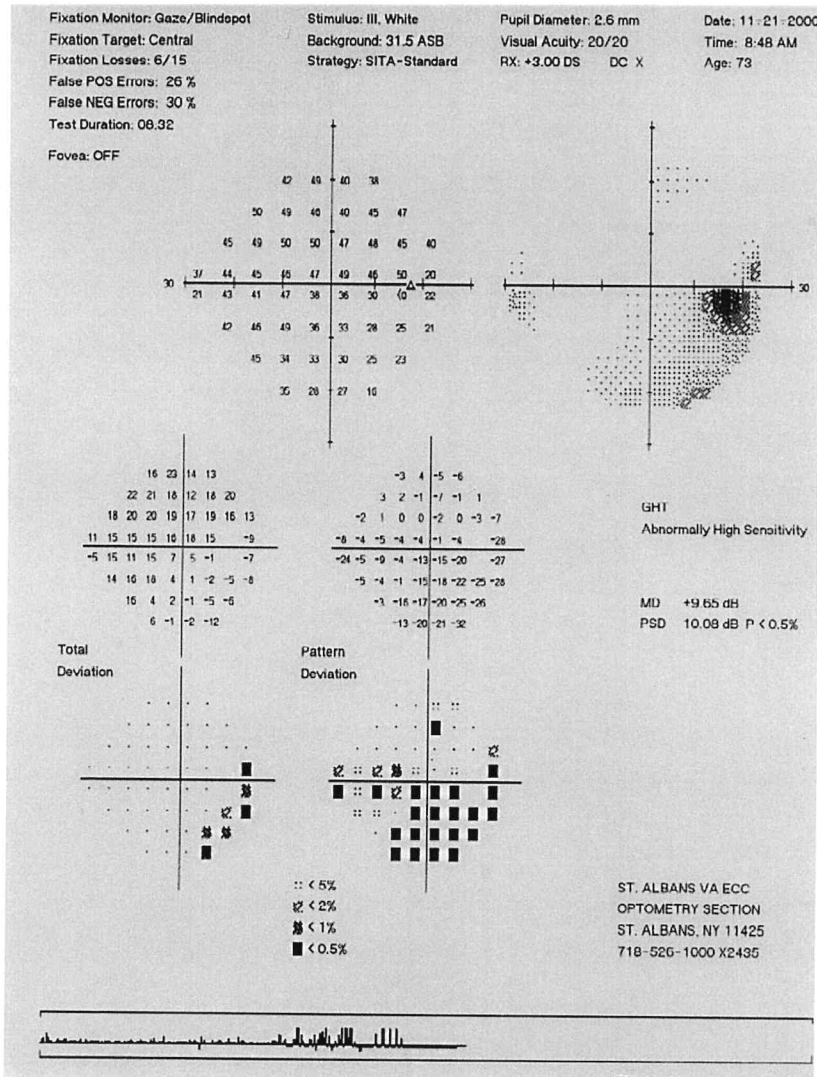
### SECTION C

A 42-year-old Caucasian man was referred to the eye clinic after being told by an optometrist that his eye pressures were too high and that he might have glaucoma. Past medical history and family history were unremarkable. He was not taking any medications. Ocular examination revealed visual acuity of 20/20 OU without correction. Pupils and motility were normal. Anterior segment biomicroscopic examination was unremarkable with a clear cornea and lens. Intraocular pressure (IOP) was 27 mm Hg OD and 28 mm Hg OS. Gonioscopy revealed wide-open angles 360 degrees with moderate pigmentation of the trabecular meshwork. Dilated funduscopy examination revealed symmetric optic nerves with mild cupping. The cup-to-disc ratio was 0.2 and the neuroretinal rim was intact OU. The macula, vessels, periphery, and vitreous were normal in appearance. Humphrey's automated perimetry was noted to be normal in both eyes.

1. What are the differential diagnoses? And why? (2 marks)

2. What is the diagnosis? (1mark)

3. Assuming after 1 year the visual field of the patient was as shown, analyze in detail the visual field breaking down each component of it (5marks)



4. What is the appropriate management and why? (2marks)

*RAGS*