



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

MAIN EXAMS

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

COURSE CODE: **BOV 322**

COURSE TITLE: **BINOCULAR VISION ANOMALIES 1**

DATE: 11/4/2023

TIME: 8.00-10.00 AM

INSTRUCTIONS TO CANDIDATES

Answer all questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating



SECTION A

1. Which of the following tests does not assess negative fusional vergence?
 - A. PRA
 - B. Binocular accommodative facility with +2.00 lenses
 - C. Binocular accommodative facility with -2.00 lenses
 - D. Vergence facility with base-in prism

2. Case TWO

A 15-year-old 10th grader presented with a history of asthenopia associated with short periods of reading.

VA(Distance, uncorrected): OD: 20/20, OS: 20/20

Near Point of Convergence: Penlight: 5 cm / 7.5 cm

Cover Test (Distance): Ortho

Cover test (Near): 4 exophoria

Subjective: OD: plano, OS: plano

-1.00 Gradient: Ortho

Base In Vergence (Near): 6/12/6

Base Out Vergence(Near) 5/9/7

NRA: +1.50 PRA: -1.50

Accommodative amplitude(push up): OD: 13D,OS: 13D

Monocular Accommodative facility OD: 12 cpm, OS: 12 cpm

Binocular Accommodative Facility: 0 cpm, difficulty with both +/-2.00

MEM Retinoscopy: +0.25 OU

For CASE Two what is the most appropriate treatment sequence?

- A. Rx home-based vision therapy to expand fusional vergence
- B. Rx home-based vision therapy to improve accommodative function
- C. Rx OD: plano with 2 base-in and OS: plano with 2 base-in and have patient return in 4 weeks for a follow-up visit
- D. Rx plano with a +1.00 add and have patient return in 4 weeks for a follow-up visit
- E. Rx +1.00 for reading and have patient return in 4 weeks for a follow-up visit

3. A patient is viewing a target at 33 cm while you perform the cover test. The distance phoria is 1 esophoria and the patient's IPD (interpupillary distance) is 66 mm. The AC/A ratio is 4/1. Predict the phoria at near.
- A. 10 exophoria
 - B. 7 exophoria
 - C. 12 exophoria
 - D. 5 exophoria
 - E. 15 exophoria
4. Which of the following examination findings (all performed at 40 cm) would be characteristic of a patient with a receded NPC, ortho at distance and 10 exophoria at near
- A. BI: 4/6/2, BO: 4/6/2
Vergence Facility: 0 cpm, fails BO and BI
NRA: +0.75, PRA: -0.75
MEM: +0.25
BAF: 0 cpm – fails +2.00 and -2.00, MAF: 11 cpm
 - B. BI: 4/6/2, BO: 12/24/12
Vergence Facility: 0 CPM, fails BI
NRA: +2.50, PRA: -0.50
MEM: +1.50
BAF: 0 cpm – fails -2.00, MAF: 11 CPM
 - C. BI: 12/24/12, BO: 4/6/2
Vergence Facility: 0 CPM, fails BO
NRA: +0.75, PRA: -2.50
MEM: Plano
BAF: 0 cpm – fails +2.00, MAF: 11 CPM
 - D. BI: 12/24/12, BO: 12/24/12
Vergence Facility: 12 CPM
NRA: +2.50, PRA: -2.50
MEM: +0.50
BAF: 9 CPM, MAF: 11 CPM

5. The best method for testing visual acuity in an infant (baby) is
- A. The Snellen Acuity Chart
 - B. The fixation preference test
 - C. The Lea Symbol Chart
 - D. The Tumbling "E" chart
6. Which of the following suggest that the patient has amblyopia?
- A. The non-preferred eye holds fixation for less than 3 seconds, but not through a blink or smooth pursuit.
 - B. The patient freely alternates without intervention on the part of the examiner
 - C. The non-preferred eye can hold fixation for at least 5 seconds, through a smooth pursuit, or through a blink
7. You perform MEM retinoscopy on a patient and find -0.50 OD and OS. Which of the following diagnoses would you suspect?
- A. accommodative insufficiency, convergence insufficiency
 - B. accommodative excess, convergence insufficiency
 - C. accommodative insufficiency, convergence excess
 - D. accommodative excess, convergence excess
8. A 5-year-old patient presents with 10 prism dioptres of esophoria at distance and 20 prism dioptres of intermittent esotropia at near. The refractive error is +1.00 OD and OS and the child has 20/20 visual acuity in both eyes with the glasses. With the glasses, the cover test is ortho at distance and 10 esophoria at near. The best diagnosis for this patient is:
- A. Accommodative esotropia secondary to hyperopia
 - B. Accommodative esotropia secondary to high AC/A ratio
 - C. Accommodative esotropia secondary to hyperopia and high AC/A ratio
 - D. Accommodative exotropia secondary to hyperopia and high AC/A ratio
9. Which of the following would be considered a significant Rx?
- A. OD: +0.75, OS: +0.75
 - B. OD: +pl - 1.00x15, OS: +0.25-1.00x165
 - C. none of the above would be considered a significant Rx
 - D. OD: -0.25, OS: -0.50
 - E. OD: +0.25-0.75x180 OS: +0.25-0.75x180

10. Case TWO

A 15-year-old 10th grader presented with a history of asthenopia associated with short periods of reading.

VA(Distance, uncorrected): OD: 20/20, OS: 20/20

Near Point of Convergence: Penlight: 5 cm / 7.5 cm

Cover Test (Distance): Ortho

Cover test (Near): 4 exophoria

Subjective: OD: plano, OS: plano

-1.00 Gradient: Ortho

Base In Vergence (Near): 6/12/6

Base Out Vergence(Near) 5/9/7

NRA: +1.50

PRA: -1.50

Accommodative amplitude(push up): OD: 13D,OS: 13D

Monocular Accommodative facility OD: 12 cpm, OS: 12 cpm

Binocular Accommodative Facility: 0 cpm, difficulty with both +/-2.00

MEM Retinoscopy: +0.25 OU

For CASE Two the diagnosis is:

- A. fusional vergence dysfunction
- B. accommodative infacility
- C. convergence insufficiency
- D. convergence excess

11. You find the following test results.

Distance cover test Ortho Near cover test 6 exophoria

AC/A ratio 3/1 Base in @ near 12/20/11 Base out @ near 8/12/8

Amplitude 12 D

What will the negative fusional vergence @ near finding be through +1.00 lenses?

- A. 15/23/14
- B. 11/15/11
- C. 5/9/5
- D. 9/17/8

12. Which of the following statements is true about the use of prism to treat binocular vision disorders?
- A. Prism is more useful with horizontal than with vertical deviations
 - B. The goal of prism correction is to increase the compensatory fusional reserve
 - C. When prism is prescribed to treat an esodeviation, we do not expect the eye to change alignment through the prism
 - D. Base out prism is used to treat exodeviations
13. A patient is struggling to perform the base-in procedure with HTS. Which of the following would be helpful to make the task easier for the patient?
- A. Have the patient view the target through -1.00 OU
 - B. Have the patient try and get the feeling of crossing his eyes
 - C. Have the patient cover one eye during the procedure
 - D. Have the patient view the target through 4 base out
14. With a 2-year-old child we would usually prescribe eyeglasses if the degree of myopia is greater than
- A. -1.25
 - B. -0.75
 - C. -1.00
 - D. -0.50
15. A 16-year-old patient presents a complaint of intermittent diplopia when looking at distance objects. The cover test examination at distance is 10 esophoria and at near ortho. The history clearly indicates that the patient has had this problem for many years. The best diagnosis is:
- A. Convergence excess
 - B. Convergence insufficiency
 - C. Divergence excess
 - D. Divergence insufficiency

16. In a pre-presbyope, what is the minimum aligning prism with the near Mallett Unit that would indicate a significant likelihood of a symptomatic horizontal heterophoria?

- A. 0.5 Δ
- B. 1 Δ
- C. 2 Δ
- D. 4 Δ

17. Which of the following is the most typical example of Sheard's criterion?

- A. A patient with 8 Δ exophoria should have a convergent fusional reserve of at least 8 Δ
- B. A patient with 8 Δ exophoria should have a convergent fusional reserve of at least 16 Δ
- C. A patient with 8 Δ exophoria should have a divergent fusional reserve of at least 8 Δ
- D. A patient with 8 Δ exophoria should have a divergent fusional reserve of at least 16 Δ

18. Which of the following statements is most strongly supported in the paper?

- A. In any child with esophoria, always give maximum cycloplegic plus
- B. In any child with esophoria, cycloplegic refraction is not usually indicated
- C. In any child with esophoria, always suspect hypermetropia
- D. In any child with esophoria, prescribe base-out prism

19. Which of the following statements about prescribing with the Mallett Fixation Disparity Test is most accurate?

- A. The test is more useful for near vision problems than for distance vision anomalies
- B. If an aligning prism is found, then this should always be prescribed
- C. If a fixation disparity is found, then this should always be prescribed
- D. The test eliminates the need for other binocular vision tests

20. Which of the following statements is true?

- A. Convergent fusional reserves are always measured before divergent reserves
- B. Convergent fusional reserves are measured with base-out prisms
- C. The blur point is measured after the recovery point
- D. The blur point can always be measured

SECTION B

1. A 25-year-old patient presents with esophoria at near of 10 prisms diopters and orthophoria at distance. The fusional reserves are BI 5/8/3 and BO 6/10/5 for near and BI X/6/4 and BO 4/6/3 for distance. The near working distance is 40 cm and the IPD is 70 mm.
 - a) Calculate the AC/A ratio. (3 marks)
 - b) What is the tentative diagnosis, and why? (3 marks)
 - c) What are the signs and symptoms the patient present with? (3 marks)
 - d) What is/are the differential diagnoses? (3 marks)
 - e) Use Sheard's criteria to calculate the amount of prism you could give the patient. (3 marks)

2. Using the *push-up* method to measure the amplitude of accommodation of a 20-year-old, you find 3D ou
 - a) Using the Hofstetter's formula, calculate the expected minimum and average amplitude of accommodation for this patient? (3 marks)
 - b) What can be the diagnosis for the patient and why? (3 marks)
 - c) Give three examples of ways you can manage this patient? (3 marks)
 - d) Differentiate between NRA (Negative relative of accommodation) and PRA (Positive relative of accommodation) and give their relevance to clinical optometry practice. (3 marks)
 - e) Name all the tests that indirectly assess PFV and NFV. (3 marks)
 - f) Explain why the NRA is an indirect method of assessing PFV. (3 marks)

3. A 10-year-old girl in the fifth grade, presented with complaints of blurred vision and eyestrain after reading for about 5 to 10 minutes. She was unsure when these problems began, but she thought it bothered her in the fourth grade as well. She had never had an eye examination, and her health status was normal.

Examination Results

VA (distance, uncorrected): OD: 20/20 OS: 20/20

VA (near, uncorrected): OD: 20/20 OS: 20/20

Near point of convergence: 20 cm

Cover test (distance): Orthophoria

Cover test (near): 8 exophoria

Distance lateral phoria: 1 base-in

Base-in vergence (distance): X/7/4

Base-out vergence (distance): X/20/10

Near lateral phoria: 7 base-in

-1.00 gradient: 5 base-in

Base-in vergence (near): 6/18/10

Base-out vergence (near): 4/12/8

NRA: +1.25

PRA: -3.00

Accommodative amplitude (push-up): OD: 14D OS: 14D

Monocular accommodative facility: OD: 7 cpm. OS: 7 cpm.

Binocular accommodative facility: 0 cpm. Fails +2.00

MEM retinoscopy: +0,25 OU

Pupils were normal, all external and internal health tests were negative, the deviation was comitant, and color vision testing revealed normal function.

- a) What is the AC/A ratio? (2 marks)
- b) What is the diagnosis of this patient? (1 marks)
- c) Explain how you have arrived at the diagnosis? (2 marks)
- d) How would you manage the patient? (2 marks)

Section C

1. A 12-year-old boy was brought in for an eye examination because of concern about his left eye drifting outward. His mother had noticed this problem since he was 3 years old, but she felt it was getting worse. In the past, the eye only turned out when he was tired or at the end of the day. She felt that his left eye was now turning out much of the day. The boy had no complaints at all. He felt his vision was clear and never experienced double vision. The boy was in good health and was not taking any medication.

Examination Results

VA (distance, uncorrected): OD: 20/20 OS: 20/20

VA (near, uncorrected): OD: 20/20 OS: 20/20

IPD: 58 mm

Near point of convergence: 7 cm

Cover test (distance): 20 PD, intermittent left exotropia

Cover test (near): 5 exophoria

Distance lateral phoria: suppression

Base-in vergence (distance): suppression

Base-out vergence (distance): suppression

Near lateral phoria: 6 exophoria

Base-in vergence (near): 8/15/9

Base-out vergence (near): x/15/10

NRA: +2.00 PRA: -2.00

Accommodative amplitude (push-up): OD: 13D OS: 13D

Monocular accommodative facility: OD: 7 cpm. OS: 7 cpm.

Binocular accommodative facility: 5 cpm.

MEM retinoscopy: +0,50 OU

Pupils were normal, all external and internal health tests were negative, the deviation was comitant, and color vision testing revealed normal function.

- a) What is the AC/A ratio? (2 marks)
- b) What is the diagnosis of this patient? (1 marks)
- c) Explain how you have arrived at the diagnosis? (2marks)
- d) How would you manage the patient? (2 marks)

2

- a) What are some feedback mechanisms we can use in Vision Therapy? (1 marks)
- b) Why is vision therapy not used as the first choice for patients with vertical phoria? (1 marks)
- c) When is surgery for vertical phoria considered? (1 MARKS)

RAGS

