

### PAPER III: SUBJECT SPECIALISATION PAPER FOR OPTOMETRY

**Date** : October 11, 2025  
**Total Marks** : 100  
**Writing Time** : 150 minutes (2.5 hours)  
**Reading Time** : 15 minutes (prior to writing time)

### GENERAL INSTRUCTIONS:

1. Write your Registration Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A & SECTION B:
  - **SECTION A** has two parts:      Part I - 30 Multiple Choice Questions  
                                                Part II - 4 Short Answer Questions

All questions under SECTION A are COMPULSORY.
  - **SECTION B** consists of two Case Studies. Choose only **ONE** case study and answer the questions of your choice.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating the Section, Part and Question Number will NOT be evaluated and no marks will be awarded.
6. Begin each Section and Part in a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. **You must hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **9 printed pages**, including this instruction page.

**GOOD LUCK**

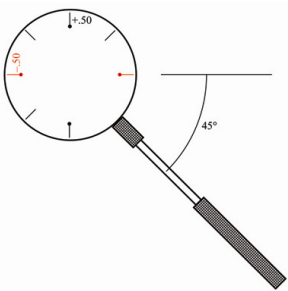
## SECTION A

### PART I: Multiple Choice Questions [30 marks]

**Choose the correct answer and write down the letter of your chosen answer in the Answer Booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. Which anterior segment condition is commonly associated with HLA-B27 positive spondyloarthropathies?
  - a) Episcleritis
  - b) Infectious keratitis
  - c) Anterior uveitis
  - d) Pterygium
2. A 58-year-old patient on long term systemic medication complains of gradual visual blurring. Fundus reveals microaneurysms, hard exudates, and few dot-blot hemorrhages. What is the most likely diagnosis?
  - a) Hypertensive retinopathy
  - b) Non-proliferative diabetic retinopathy
  - c) Central serous chorioretinopathy
  - d) Retinal vein occlusion
3. During low vision assessment, which is the most appropriate magnifier type for a patient with severe hand tremors?
  - a) Hand-held magnifier
  - b) Stand magnifier
  - c) Clip-on telescope
  - d) Dome lens
4. A 26-year-old patient complains of haloes around lights, especially at night, after starting silicone hydrogel lenses. What is the most likely cause?
  - a) Lens decentration causing glare
  - b) Poor compliance with cleaning
  - b) Corneal infection
  - d) Corneal neovascularization
5. A visually impaired child with albinism and nystagmus benefits most from:
  - a) Cylindrical correction
  - b) Filters and high-contrast magnifiers
  - c) Tinted contact lenses
  - d) Pinhole occluder
6. You are leading an eye health program in rural Bhutan. Which refractive service model is most cost-effective and scalable?
  - a) Mobile spectacle van with optometrist only
  - b) Free spectacles through hospital only
  - c) Vision technician-led screening with referral
  - d) Eye hospital-based full refraction for all

7. A patient with myopia and high lag of accommodation may benefit from which management during near work?
- a) Minus add
  - b) Cycloplegics
  - c) Concave prisms
  - d) Low plus addition lenses
8. The Maddox rod test is primarily used to detect
- a) Heterochromia
  - b) Heterophoria
  - c) Steropsis
  - d) Accommodative lag



9. What is the use of the above instrument?
- a) Perform objective refraction
  - b) Measure accommodation amplitude
  - c) Refine astigmatism axis and power
  - d) Confirm binocular vision
10. Which material offers the best combination of high impact resistance and UV protection for pediatric patients?
- a) Polycarbonate
  - b) CR-39
  - c) Trivex
  - d) Glass
11. Which of the following conditions is most acceptable for elective corneal transplantation using stored tissue?
- a) Fungal keratitis unresponsive to antifungals
  - b) Optical keratoplasty in pseudophakic bullous keratopathy
  - c) Traumatic full-thickness corneal laceration with iris prolapse
  - d) Peripheral ulcerative keratitis associated with rheumatoid arthritis
12. Which drug is contraindicated in narrow-angle glaucoma?
- a) Acetazolamide
  - b) Phenylephrine
  - c) Latanoprost
  - d) Timolol

13. Which statement about accommodation-convergence relationship is CORRECT?
- a) Increased accommodation reduces convergence
  - b) AC/A ratio is calculated using heterophoria method
  - c) All near tasks require positive fusional reserve
  - d) NRA testing isolates fusional convergence
14. A patient undergoing vision rehabilitation is unable to manage near tasks due to concentric field loss. Which aid is LEAST helpful?
- a) Illuminated stand magnifier
  - b) Hand-held telescope
  - c) Eccentric viewing training
  - d) Braille
15. Which extraocular muscle originates from the anterior orbit, rather than the common tendinous ring?
- a) Medial rectus
  - b) Inferior oblique
  - c) Superior rectus
  - d) Lateral rectus
16. Which of the following is the primary treatment for corneal ulcer due to bacterial origin?
- a) Lubricating drops
  - b) Topical steroids
  - c) Fortified antibiotics
  - d) Antiviral agents
17. Using the *Prentice's Rule*, calculate the prismatic effect induced at 10 mm below the optical center in a +4.00 D single vision lens?
- a) 0.2 prism diopters base up
  - b) 0.4 prism diopters base down
  - c) 0.2 prism diopters base down
  - d) No prismatic effect
18. A patient complains of image swim and distorted peripheral vision with new progressives glasses. What is the most probable reason?
- a) Incorrect monocular PD and fitting height
  - b) Incorrect lens material
  - c) Axis misalignment
  - d) Wrong base curve
19. Bhutan recently launched the WHO SPECS 2030 initiative. What is the primary aim of the initiative?
- a) Universal cataract coverage
  - b) Eliminate infectious blindness
  - c) Scale up effective refractive error coverage
  - d) Eliminate childhood blindness by 2030
20. Which of the following materials has the highest oxygen permeability among current lens options?
- a) PMMA
  - b) Hydrogel
  - c) Silicone hydrogel
  - d) HEMA

21. Which of the following is considered a true ocular emergency requiring same-day referral?
- a) Non-proliferative diabetic retinopathy
  - b) Acute angle-closure glaucoma
  - c) Macular degeneration
  - d) Congenital cataract
22. A 62-year-old diabetic patient presents with sudden, painless vision loss in one eye and sees “a curtain coming down.” What is the most likely diagnosis?
- a) Central retinal artery occlusion
  - b) Retinal detachment
  - c) Optic neuritis
  - d) Macular edema
23. In a population-based survey, the prevalence of myopia among 12-year-olds was 48%. Which term best describes this value?
- a) Incidence
  - b) Hazard ratio
  - c) Prevalence
  - d) Odds ratio
24. A 10-year-old boy with -3.00 D myopia progresses by -1.00 D per year. Which intervention is currently most evidence-based to slow progression?
- a) Tinted glasses
  - b) Avoid reading
  - c) Orthokeratology lenses
  - d) Low-dose atropine (0.01%–0.05%)
25. A patient using monthly replacement silicone hydrogel lenses reports discomfort and dryness after 8 hours. Slit lamp shows papillae on the upper tarsal conjunctiva. The most likely diagnosis is:
- a) Allergic conjunctivitis
  - b) Giant papillary conjunctivitis (GPC)
  - c) Corneal abrasion
  - d) Pingueculitis
26. A child with intermittent exotropia and normal VA is undergoing vision therapy. What is a sign of successful therapy progression?
- a) Decreased NPC
  - b) Increasing accommodative lag
  - c) Improved fusional convergence amplitudes
  - d) Worsening of stereoacuity
27. Which of the following statements about congenital nasolacrimal duct obstruction (CNLDO) is TRUE?
- a) Most cases require surgical intervention within the first month of life
  - b) Over 90% of cases resolve spontaneously within the first year
  - c) The most common site of obstruction is the punctum
  - d) It typically presents with photophobia and redness

28. While refracting a hyperopic patient, you notice that their visual acuity improves significantly with +1.00 DS. However, the patient complains of headache while reading. What is the likely issue?
- a) Overcorrection
  - b) Latent nystagmus
  - c) Uncorrected accommodative strain
  - d) Incorrect axis of cylinder
29. The optimal duration of full-time occlusion therapy for moderate amblyopia in a 6-year-old is generally:
- a) 2 hours per day
  - b) 2 to 6 hours per day, depending on severity
  - c) Only during reading activities
  - d) 10 to 12 hours continuously for all ages
30. Which metabolic pathway is involved in the formation of sorbitol, contributing to diabetic cataract?
- a) TCA cycle
  - b) Urea cycle
  - c) Polyol pathway
  - d) Pentose phosphate pathway

## **PART II – Short Answer Questions [20 marks]**

**This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks.**

1. Draw and label the structure of the lacrimal drainage system. What is the role of Valve of Hasner?  
**(5 marks)**
2. What is computer vision syndrome? Explain the 20-20-20 rule. **(5 marks)**
3. A 12-year-old student with albinism has reduced distance vision (6/36 OU), nystagmus, photophobia, and difficulty copying from the blackboard. He uses normal print books in class but struggles with contrast and glare. List and briefly explain five low vision interventions or adaptations you would recommend to improve his function in the classroom. **(5 marks)**
4. Define eREC and eCSC. How is the quality gap calculated? **(5 marks)**

**SECTION B: Case Study [50 marks]**

**Choose either CASE I OR CASE II from this section. Each case study carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**CASE I**

An 8-year-old girl presents with complaints of blurred distance vision and difficulty copying from the board. Her mother has -7.00 D and reports that her daughter reads a lot and spends little time outdoors. On clinical examination, uncorrected VA was 6/18 (OU). Dry retinoscopy revealed -2.00 DS (OU) and cycloplegic refraction showed -1.75 DS (OU). The AC/A ratio was normal. Cover test revealed mild exophoria. Axial length was 24.7 mm in both the eyes. Corneal topography was normal and funduscopy showed tessellated fundus patterns. The concern from the parents was “Can we stop her glasses from increasing every year?” Parents say that they heard about “blue-filter lenses” as myopia control lenses.

Based on the above information, answer the following questions:

1. Based on axial length and refraction, classify the myopia. Is this physiologic or pathologic? Justify using both refractive and structural clues. **(3 marks)**
2. Interpret the findings of the axial length. Is it concerning? **(3 marks)**
3. Briefly describe current evidence-based interventions to slow the progression of myopia. **(10 marks)**
4. Draw a ray diagram to show the refractive status and how it can be corrected by a minus lens. **(5 marks)**
5. What is the recommended screen time for children under the age of 12 years? **(3 marks)**
6. Discuss prescribing strategy. Would you provide full correction or under-correction? Justify **(4 marks)**
7. What are ‘blue-filter lenses’? Would you recommend them? Justify **(3 marks)**
8. When should ortho-K be considered? What are its risks? **(4 marks)**
9. What is the AC/A ratio? Briefly explain it. **(3 marks)**
10. Imagine that you are invited for an interview in BBS to talk about myopia. List down a few important points you may not want to miss to convey to the public. **(5 marks)**
11. Discuss the public health implications of the rising prevalence of myopia in Bhutan or South Asia and how optometrists can support national eye health goals. **(5 marks)**
12. Briefly describe the working principle of retinoscopy. **(2 marks)**

## **CASE II**

A 68-year-old retired school principal presents with complaints of sudden onset of central vision loss in the right eye for 3 days. He describes it as “*a black spot right in the center*” with surrounding blur and mild distortion. He finds it difficult to read, recognize faces, and pour tea. He has been diabetic and hypertensive for over 20 years, both moderately controlled. He reports a recent increase in BP medication. He lives alone and is very worried.

On clinical examination the findings were as follows:

| <b>Sl#</b> | <b>Parameters</b>             | <b>OD</b>                                                                                                                                                                   | <b>OS</b>                        |
|------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 1          | Uncorrected distance VA       | 6/60                                                                                                                                                                        | 6/9                              |
| 2          | Refraction (post cycloplegic) | +0.50/-0.25 x 180                                                                                                                                                           | +1.25                            |
| 3          | Best corrected VA/Pinhole VA  | 6/60                                                                                                                                                                        | 6/9                              |
| 4          | Slit lamp                     | Anterior segment normal                                                                                                                                                     | Anterior segment normal          |
| 5          | IOP                           | 15mmHg                                                                                                                                                                      | 20 mmHg                          |
| 5          | OCT                           | Presence of fluid under the retina<br>A small dome-shaped bump under the central retina (PED)<br>Mild disruption of the outer retinal layers (photoreceptors)               | Normal                           |
| 6          | Fundoscopy                    | A fresh, dark-red patch of bleeding just below the central macula (subretinal hemorrhage)<br>A gray-green area under the fovea, suggesting abnormal new blood vessels (CNV) | Normal fundus, mild RPE mottling |

**Based on the above information, answer the following questions:**

1. Based on history and findings, what is your provisional diagnosis? Classify the type of macular degeneration and justify it with clinical evidence. **(3 marks)**
2. Outline a referral protocol for this patient. Which specialist is involved and what additional diagnostics may be required? **(5 marks)**
3. Briefly describe low vision aids suitable for this patient’s functional limitations (e.g., reading, pouring liquids, TV viewing). Include both optical and non-optical devices. **(5 marks)**

4. What is the role of an optometrist in early detection and co-management of AMD in aging populations? Include aspects of education, surveillance, and rehabilitation. **(5 marks)**
5. List down all the layers of the retina. What is the function of photoreceptors? **(7 marks)**
6. List down 3 causes of sudden loss of vision. Briefly describe one of them. **(5 marks)**
7. What is anti-VEGF? Name one commonly used anti-VEGF. **(3 marks)**
8. Draw a ray diagram to show the type of refractive error in the left eye. **(3 marks)**
9. What are the different parts of a slit lamp? Name two accessories that are attached or can be attached to slit lamp. **(4 marks)**
10. What is IOP? What is your observation on the IOP of this patient? **(3 marks)**
11. Imagine the patient asks: "*Will I go blind in the other eye?*" How would you counsel him empathetically about prognosis, monitoring, and lifestyle modification? **(4 marks)**
12. How eye health message would you convey to the public regarding diabetes and hypertension? **(3 marks)**

**TASHI DELEK**