

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2022
EXAMINATION CATEGORY: TECHNICAL**

PAPER III: SUBJECT SPECIALISATION PAPER FOR OPTOMETRY

Date	: October 9, 2022
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 **8 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. An individual wearing aphakic glasses will mostly experience:
 - a) Barrel distortion
 - b) Pin-cushion distortion
 - c) Spherical aberration
 - d) Chromatic aberration

2. All of the following are risk factor for retinopathy of prematurity in newborn **EXCEPT**
 - a) Low birth weight
 - b) Low gestational age
 - c) High APGAR score
 - d) O₂ supplementation

3. Which of the following statements is **NOT TRUE** regarding prescription for ametropia?
 - a) Small amount of astigmatism may not be prescribed if the sphere power is high.
 - b) Hyperopia should be under-corrected in individuals with exophoria.
 - c) Myopia should be under-corrected as a myopia control strategy.
 - d) Pseudo myopia can be ruled out by cycloplegic refraction.

4. Spectacle temples vary significantly in their construction. Which of the following is **NOT** a category of a temple?
 - a) Skull
 - b) Saddle
 - c) Library
 - d) Riding bow

5. Which of the following statements is **CORRECT** regarding biometry?
 - a) Standard SRK formula can be used for all eyes irrespective of axial length.
 - b) Curvature of the cornea will not interfere with the final IOL power.
 - c) 'A constant' of an IOL does not influence the final IOL power.
 - d) Longer the axial length, the lower will be the IOL power.

6. Recurrent bilateral conjunctivitis occurring with the onset of hot weather in young boys with symptoms of burning, itching, and lacrimation with cobblestone papillae in the palpebral conjunctiva is:
 - a) Trachoma
 - b) Phlyctenular conjunctivitis
 - c) Vernal keratoconjunctivitis
 - d) Mucopurulent conjunctivitis

7. Effective treatment option for dendritic corneal ulcers is:
 - a) Chloramphenicol ointment
 - b) Moxifloxacin eye drop
 - c) Acyclovir ointment
 - d) Ketorolac eye drop

8. With regard to visual optics, which one of the following statements is **FALSE**?
 - a) Reddish appearance of the sun at sunrise is explained by Rayleigh's law of scattering.
 - b) Rearview mirror of a vehicle should produce a diminished and virtual image.
 - c) Colours in a rainbow are formed by the phenomenon of dispersion.
 - d) Mirage is an example of total internal reflection of light.

9. What is the velocity of light in a diamond if the refractive index of the diamond with respect to vacuum is 2.5?
 - a) 1.2×10^8 m/s
 - b) 2.5×10^8 m/s
 - c) 3.0×10^8 m/s
 - d) 5.0×10^8 m/s

10. Which of the following statement is **INCORRECT** regarding contact lenses?
 - a) Soft contact lenses are made of polymethyl methacrylate.
 - b) RGP lenses can correct astigmatism without cylindrical power.
 - c) Three-point-touch is the ideal fit for rigid gas permeable lenses.
 - d) Ortho K lenses are overnight worn contact lenses to correct myopia.

11. In regard to community ophthalmology, which of the following statement is **FALSE**?
 - a) According to the RAAB 2018 survey, the prevalence of blindness in Bhutan is 1%.
 - b) Bhutan school sight program revealed that the refractive error in children was 24%.
 - c) 74th WHA endorsed targets to increase effective coverage of refractive errors by 40%.
 - d) RARE and RESC are standard protocols for refractive error surveys.

12. Distometer is an ophthalmic instrument to measure:
 - a) Interpupillary distance
 - b) Vertex distance
 - c) Pantoscopic tilt
 - d) Facial wrap

13. A 22-year-old girl with a spectacle correction of -6.00/-4.00 x180 in both eyes wants to wear contact lenses. The best contact lens option for her would be
 - a) Rigid gas permeable lens.
 - b) Soft toric contact lens.
 - c) Scleral contact lens.
 - d) Rose K contact lens.

14. A 55-year-old bilateral pseudophakic man with a distance correction of +0.75 wants to wear only near correction. What would his glass prescription be for near work at 40 cm?
- +2.50 DS
 - +3.00 DS
 - +3.25 DS
 - +3.75 DS
15. A patient presents with severe eye pain four days following cataract surgery. On examination with a torch, the eye is red and inflamed with ciliary injection and a layer of pus in the anterior chamber. The most likely diagnosis is
- Normal postoperative inflammation
 - HLA B27 associated uveitis
 - Endophthalmitis
 - Corneal ulcer
16. During Humphrey Visual Field (HVF) testing, if an individual presses the button without seeing the light, there could be high:
- False positive
 - False negative
 - Fixation losses
 - Pattern losses
17. The most dangerous differential diagnosis to consider for leukocoria is:
- Congenital cataract
 - Retinoblastoma
 - Corneal ulcer
 - Sarcoidosis
18. The most correct statement regarding ocular chemical injuries is:
- Acid splashes are more destructive than alkaline splashes.
 - Copious and urgent irrigation is the best emergency treatment.
 - Detailed history should be taken prior to starting the management.
 - It is useful to neutralise acid injuries with an alkaline solution and vice versa.
19. FDA has classified soft contact lens material as Group I to Group IV. Which of the following classification sequence is **CORRECT**?
- Non-ionic low WC, Non-ionic high WC, Ionic low WC, Ionic high WC
 - Non-ionic high WC, Non-ionic low WC, Ionic high WC, Ionic low WC
 - Ionic low WC, Ionic high WC, Non-Ionic low WC, Non-Ionic high WC
 - Ionic high WC, Ionic low WC, Non-Ionic high WC, Non-Ionic low WC
20. Which of the following drugs is not used topically for the treatment of open-angle glaucoma?
- Latanoprost
 - Brimonidine
 - Acetazolamide
 - Dorzolamide

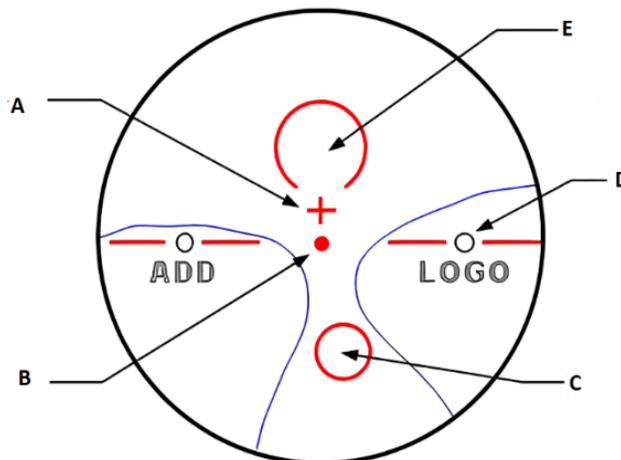
21. Pachymetry is a measurement of _____ and is used as a test to determine _____.
- Corneal thickness; keratoconus
 - Corneal thickness; astigmatism
 - Corneal curvature; RGP fit
 - Corneal curvature; glaucoma
22. All of the following tests can be performed using an optical coherence tomography **EXCEPT**
- OCT-Radial
 - OCT-Angiography
 - OCT-Ultrasonography
 - OCT-Nerve fibre layer
23. Which of the combination of disease and low vision aid is **INCORRECT**?
- Oculocutaneous albinism: NoIR Filters
 - Advanced glaucoma: Field expander
 - Nystagmus: Monocular telescope
 - Stargardt's disease: Fresnel prism
24. The ICD 10 code for 'disorders of refraction and accommodation is:
- H10
 - H25
 - H52
 - H57
25. Which of the following abbreviation is **INCORRECT** in ophthalmology?
- PKP: Penetrating keratoplasty
 - VKC: Viral keratoconjunctivitis
 - FTMH: Full thickness macular hole
 - RAF Rule: Royal Air Force Rule
26. Which international organization donated 400,000 spectacles to the Ministry of Health, Bhutan?
- International Agency for Prevention of Blindness
 - Himalayan Cataract Project
 - Essilor International
 - Mission for Vision
27. The first stage a person passes through on hearing about his untreatable visual impairment is:
- Denial
 - Shock
 - Anger
 - Depression
28. Atypical of a dull retinoscopy reflex is:
- High hypermetropia
 - Retinal detachment
 - Vitreous opacities
 - Nuclear sclerosis

29. A child with oculocutaneous albinism usually complains of
- Photophobia
 - Night blindness
 - Colour blindness
 - Near vision difficulty
30. In dispensing optics, which of the following statement is **FALSE**?
- A +3.00 spectacle designed for near should not be given for +3.00 distance correction.
 - If the distance IPD of an individual is 60mm, the near IPD would be 56mm.
 - Polycarbonate lenses are impact and scratch-resistant.
 - Aspheric lenses are prescribed in cases of high powers.

PART II – Short Answer Questions [20 marks]

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

- Draw a diagram to show fundus findings in pathological myopia.
- Tabulate the causes of central and peripheral vision loss.
- Write a short note on monocular telescope.
- Label the major reference points (A-E) of a progressive addition lens in the distance shown below.



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

Part A

A four-year-old boy was screened during the school eye health program and was referred to you for a squint evaluation. On examination, the UDVA was 6/18, near visual acuity was N12 at 40 cm in both the eyes and the dry retinoscopy was +6.00 in both the eyes. Squint evaluation revealed 30 degrees ET on the Hirschberg test at 40 cm and the AC/A ratio was high.

Based on the above information, answer the following questions:

1. What is the most probable diagnosis for the case and what additional test would you perform to confirm the diagnosis? **(5 Marks)**
2. Would you prescribe a bifocal glass for the child? Why? **(3 Marks)**
3. Expand the abbreviation ET, AC/A, and UDVA. **(3 Marks)**
4. Draw a diagram to illustrate the ametropia revealed on dry refraction. **(4 Marks)**
5. Explain how you would perform Hirschberg corneal reflex test and interpret the findings? **(5 Marks)**
6. "School eye health program is an important component of community ophthalmology". Elaborate it. **(5 Marks)**

Part B

A 65-year-old presented with a complaint of gradual painless blurred central vision and difficulty in low illumination in the right eye for past one year. In the left eye, he complained of loss of vision due to blunt ocular trauma with a bamboo stick at the age of 35 years. He is a social drinker and had a history of smoking for the past 25 years. His best corrected visual acuity in the right eye was 6/36 and was on a prosthetic shell in the left eye. On slit lamp examination there was a posterior subcapsular cataract and funduscopy revealed RPE atrophy and drusen in the right eye.

Based on the above information, answer the following questions:

1. Write down the most probable diagnosis in the right and left eye? **(2 Marks)**
2. Differentiate between readymade and customized prosthetic shell. **(5 Marks)**
3. If the patient was referred to your low vision clinic, what management would you advise? **(5 Marks)**
4. Calculate the magnification of monocular telescope you would advise to obtain 6/6 vision. **(3 Marks)**
5. Write down the classification of ocular trauma? **(5 Marks)**
6. Draw a labelled diagram to show the anatomy of a crystalline lens with subcapsular cataract. **(5 Marks)**

CASE II

Part I

A 3-month-old child was brought to you with a complaint of constant watering from the eye with occasional discharge. On external examination the conjunctiva, cornea, and crystalline lens were clear. However, FDDT tested positive.

Based on the above information, answer the following questions:

1. What is the most probable diagnosis? Briefly describe the treatment and management plan for the case. **(5 Marks)**
2. What would be the refractive status of a normal child at 3 months of age? Why? **(3 Marks)**
3. If you were asked to assess the visual acuity of the child, how would you assess it? **(5 Marks)**
4. If the cornea was hazy and the diameter was 12 mm, what would be the probable diagnosis? **(2 Marks)**
5. Expand FDDT. Describe the procedure and interpretation of FDDT. **(5 Marks)**
6. Justify the statement; 'A child's eye is not a small adult eye' **(5 Marks)**

Part B

A 35-year-old man was diagnosed with bilateral advanced keratoconus with large central corneal opacity in the left eye. Uncorrected visual acuity in the right eye was 6/60 improving to 6/24 with -6.00/-9.00x180 on a trial frame. In the left eye, the unaided visual acuity was HM but the retinal reflex was very dull on retinoscopy. However, visual acuity on the left eye improved to 3/60 with a pinhole. The patient works in a hydropower project and seeks options for treatment.

Based on the above information, answer the following questions:

1. What are the clinical features of keratoconus? **(6 Marks)**
2. What are the treatment options for keratoconus? **(5 Marks)**
3. If the patient denies any surgical interventions, would you first refer the patient to a low vision clinic or a contact lens clinic? Why? **(4 Marks)**
4. Calculate the monocular telescope magnification if you target visual acuity to improve to 6/12 in the patient's right eye. **(2 Marks)**
5. Tabulate three causes of dull retinoscopic reflex and ways to troubleshoot it. **(3 Marks)**
6. Explain the working principle of retinoscopy with a help of a diagram. **(5 Marks)**

TASHI DELEK