ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2020
EXAMINATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALISATION PAPER FOR OPTOMETRY

Date : February 27, 2021
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 the 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 on 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. With regard to colour vision testing, which of the following statement is TRUE?
   a) Ishihara test is performed from a distance of 40 cm.
   b) Ishihara test plates cannot be used by pre-verbal children.
   c) The Fransworth-Munsell hue 100 test contains 100 colour discs.
   d) Ishihara test plates are designed mainly for congenital red-green colour defects.

2. In keratoconous, dark fine iron deposit at the base of the cone is termed as
   a) Fleischer's ring
   b) Munson's sign
   c) Rizzuti's sign
   d) Vogt's striae

3. A 64-year-old man complains of horizontal diplopia which is worse on right gaze. Which of the following is NOT TRUE if he had a sixth nerve palsy?
   a) A right esotropia which is worse for distance than near.
   b) Improved right eye movement when the left eye is closed.
   c) A face turns to the left.
   d) V pattern on upgaze.

4. The generic name of the drug 'Avastin' is
   a) Atizolizumab
   b) Bevacizumab
   c) Cetuximab
   d) Ranibizumab

5. Preservatives found in topical ophthalmic agents include all of the following EXCEPT
   a) Benzalkonium chloride
   b) Chlorhexidine
   c) Chlorbutol
   d) Nystatin

6. The onset of presbyopia does not depend on
   a) The size of the pupil
   b) Gender of the patients
   c) Amplitude of accommodation
   d) The refractive state of the patients

7. A recently discovered treatment for retinoblastoma significantly extends the lifespan of the patient, but does not prevent the disease or lead to its cure. Given this scenario, which of the following statements about retinoblastoma is TRUE?
   a) It's incidence will increase
   b) It's prevalence will increase
   c) It's incidence will decrease
   d) It's prevalence will decrease

8. You are measuring the deviation in a child with strabismus. The corneal light reflex is 2mm temporal to the pupil in the right eye. How much deviation would you estimate?
   a) 20 diopters esotropia
   b) 20 diopters exotropia
   c) 30 diopters esotropia
   d) 30 diopters exotropia

9. A patient complains of flare at night when driving with her RGPs. Her -5.00 lenses are positioned 2.5mm superior temporal in both eyes. Which of the following combinations will best alleviate her symptoms?
   a) steepen BC and increase OZD
   b) flatten BC and decrease OZD
   c) steepen BC and decrease TD
   d) flatten BC and increase TD

10. Which of the following combination of ocular disease and clinical appearance of retina is NOT correct?
    a) Hypertensive retinopathy: 'Copper wiring'
    b) Stargardt's Disease: Beaten-bronze' appearance
    c) Central Retinal Artery Occlusion: 'Cherry red spot'
    d) Age-related macular degeneration: 'salt and pepper' appearance

11. In regard to the clinical refraction, which of the following statement is NOT true?
    a) Visual acuity should be measured uniocularly for distance and near.
    b) Recent wearing of RGP contact lens may give false refractive status.
    c) Accommodation during refraction results in a more myopic prescription.
    d) Occlusion is recommended for patient with nystagmus to reduce the ocular movement.

12. What telescopic magnification is required for a patient whose best corrected visual acuity is 10/120 for reading a sign board, where the estimated visual acuity required is 20/40?
    a) 3x
    b) 4x
    c) 6x
    d) 8x

13. Compared with glasses, the contact lenses
    a) increases the amount of convergence needed in myopes.
    b) increases the amount of accommodation needed in myopes.
    c) increases the amount of convergence needed in hypermetropes.
    d) decrease the amount of accommodation needed in hypermetropes.

14. LASIK is superior to photorefractive keratectomy for all of the following reason EXCEPT
    a) LASIK has less complication
    b) LASIK is a less painful procedure
    c) LASIK can treat a higher myopia
    d) LASIK gives a faster visual rehabilitation

15. Which of the following statement about prism is TRUE?
    a) Light is deviated towards the apex.
    b) Orientation of prism is defined by its apex.
    c) Light with shorter wavelength is deviated more than the longer wavelength
    d) Ophthalmic prisms are calibrated according to the Prentice's position

16. For a distance correction of -2.50/-1.00 x 180 and near correction of +0.50/-1.00 x180, what is the near addition power?
    a) +2.00
    b) +2.50
    c) +3.00
    d) +3.50

17. Which of the following is NOT a function of the superior rectus muscle?
    a) Elevation of the globe
    b) Abduction of the globe
    c) Intortion of the globe
    d) Retraction of the globe

18. Which of the following is TRUE about a contact lens with the following numbers 8.5/14.0/4.00?
    a) The contact lens has a base curve of 8.5 mm.
    b) The contact lens has a base curve of 14 mm.
    c) The contact lens has a diameter of 8.5 mm.
    d) The contact lens has a power of 8.5 D.

19. In regard to galucoma medication, which of the following combination is NOT CORRECT?
    a) Timolol: Beta blockers
    b) Mannitol: Hyperosmotic agent
    c) Latanoprost: Prostaglandin analogs
    d) Brimonidine: Carbonic anhydrase inhibitors

20. After cataract surgery with posterior chamber intraocular lens (PCIOL) implantation, the residual refractive error of a patient was -3.00 DS. What could be the possible cause?
    a) Flattening of the cornea
    b) Overcorrection of IOL power
    c) Undercorrection of IOL power
    d) Dislocation of IOL into the vitreous

21. With regard to eye donation, which of the following statement is TRUE?
    a) Individuals with HIV can donate eyes.
    b) Donated eyes are preserved in M-K media.
    c) Eye should be removed within four hours of death.
    d) The eyeball including crystalline lens can be transplanted.

22. The frame material which is extremely light weight, can be made thin and will not rust is
    a) Monel
    b) Titanium
    c) Stainless steel
    d) German silver

23. Which of the following set of investigation is LEAST recommended for patient undergoing cataract surgery?
    a) Blood pressure and viral markers
    b) PAM and intraocular pressure
    c) Fundus photo and lipid profile
    d) B-Scan, endothelial cell count

24. Chalazion is
    a) neoplasm of the Meibomian glands.
    b) retention cyst of the Meibomian glands.
    c) acute suppurative inflammation of Meibomian glands.
    d) chronic granulomatous inflammation of Meibomian glands.

25. A one-month-old baby is brought with complaints of photophobia and watering. Clinical examination shows an englarged eyeball with corneal haze. The most likely diagnosis is
    a) Keratoconus
    b) Buphthalmos
    c) Interstitial keratitis
    d) Congenital dacryocystitis

26. All of the following occurs with silicone oil in the eye EXCEPT
    a) Reduces the hypermetropic power of an aphakic eye.
    b) Causes a myopic shift in a phakic eye.
    c) Increases the speed of ultrasound passing through it.
    d) Causes band keratopathy.

27. The average distance of the fovea from the temporal margin of the optic disc is
    a) 1 disc diameter
    b) 2 disc diameter
    c) 3 disc diameter
    d) 4 disc diameter

28. Which of the following is TRUE about photoreceptors?
    a) There are 2 rods for every cone in the human eye.
    b) The highest density of rod is found outside the macula.
    c) The cones are 100 to 1000 times more sensitive to light than rods.
    d) A typical photoreceptor takes 10 days to renew its outer segments.

29. Which of the following abbreviation used in ophthalmology is NOT CORRECT?
    a) PXF:Pseudoexfoliation
    b) OCT: Optical Coherence Topography
    c) CLARE: Contact lens-induced acute red eye
    d) ETDRS: Early Treatment Diabetic Retinopathy Study

30. According to the RAAB survey 2018, the prevalence of bilateral blindness in Bhutan is
    a) 0.5%
    b) 1.0%
    c) 1.5%
    d) 2.0%

PART II – Short Answer Questions [20 marks]

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

1. What is diabetic retinopathy? List down its risk factor and briefly explain its pathogenesis.

2. Write a short note on accommodative esotropia?

3. What is ocular prosthesis? Write down the indication of ocular prosthesis.

4. What is reflection? Explain the laws of reflection with the help of a diagram.

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

A 20-year-old girl presents to you for a routine follow up. On examination, the following was noted:

Examination	OD	OS
PVA	6/12	6/18
Previous glass prescription	-5.00/-2.00 x 180	-9.00/-3.00 x 180
Subjective refraction	-6.00/-2.00 x 180	-9.50/-3.00 x 180
BCVA	6/6	6/18

Based on the above information, answer the following questions:

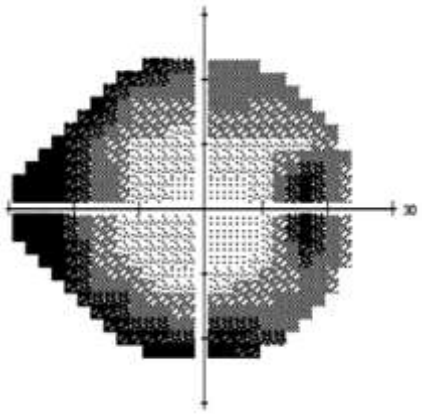
1. What are the probable causes of decreased vision in the left eye even after refractive correction? (3 marks)
2. What other ophthalmic investigations would you perform for the patient and why? Describe in detail. (10 marks)
3. If the axial length was 26.0 mm and 28.5 mm in the OD and OS, respectively;
   a) List down five possible findings in the retina. (2.5 marks)
   b) Will the spectacle cause diolopia? Why? (2.5 marks)
4. If the patient wants to wear contact lens in her new prescription;
   a) Calculate the contact lens power you would prescribe (vertex distance 12mm). (5 marks)
   b) What type of contact lens would you prescribe? (2 marks)
5. If the patient wants to undergo refractive surgery;
   a) What additional ophthalmic test will you perform before you advise refractive surgery? (5 marks)
   b) If indicated, what type of refractive surgery would you advise? (2 marks)
6. Using the Hofstetter's formula, calculate the minimum, average and maximum amplitude of accommodation of the patient. (3 marks)
7. How is previous glass prescription checked? Briefly describe any one of the procedures. (5 marks)
8. Write down a short note on myopia control. (5 marks)
9. Expand the abbreviation of OD, OS, PVA and BCVA used in ophthalmology? (2 marks)
10. List down the uses of prism in ophthalmology. (3 marks)

CASE II

A 18-year-old boy studying in class XI presents to the Department of Ophthalmology, JDW National Referral Hospital with gradual painless loss of vision and difficulty to see in relatively low light. Ophthalmic examination revealed the following:

Examination	**Right Eye**	**Left eye**
UDVA (on LogMAR)	1.0 (6/60)	0.9 (6/48)
Subjective refraction	- 2.50 DS	-1.00 DS/-1.00 DC x 180
BCVA (on LogMAR)	0.9 (6/48)	0.9 (6/48)
Near Vision at 40cm	N24	N18
Anterior segment	Normal	Normal
Posterior segment	waxy disc pallor, arteriolar attenuation, retinal pigmentary changes	waxy disc pallor, arteriolar attenuation, retinal pigmentary changes

The visual field analysis showed the following:



Based on the above information, answer the following questions:

1. What is the most probable diagnosis for the condition? (2 marks)
2. How would you manage the condition? Describe in detail. (10 marks)
3. Does the patient require referral to low vision clinic? Define low vision. (3 marks)
4. If the target distance visual acuity for the student in the right eye is 6/12, calculate the telescopic magnification power required. (3 marks)
5. In regard to the visual field;
   a) What type of visual field test was performed? (3 marks)
   b) Is it the visual field analysis of the right eye or left eye? Justify your answer. (3 marks)
   c) What indicators would you check to see if the test results are reliable or not? (4 marks)

6. Tabulate the difference between LogMAR and Snellen visual acuity chart. (5 marks)

7. List down four cause of gradual painless decrease of vision. Explain any one of them briefly. (2+3=5 marks)

8. What is the type of refractive error present in the left eye? With a help of a ray diagram, explain how the image is formed on the retina in the left eye. (1+3=4 marks)

9. How would you assess the distance visual acuity in a pre-verbal child? (5 marks)

10. Write a short note on the causes of dull reflex during objective retinoscopy. (3 marks)

TASHI DELEK