

Optics Examination
Master / Diploma Degree in Ophthalmology
August 2016
Date: 16/8/2016
Time allowed: 3 hours
Total marks: 30 marks



ANSWER ALL QUESTIONS

ILLUSTRATE WITH DIAGRAMS WHENEVER APPLICABLE

Discuss the following: (5 Marks EACH)

1. Diffraction of light and its clinical applications.
 2. Spherical lens decentration.
 3. Measurement of angle alpha and its significance.
 4. Optical principle of applanation tonometry.
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Multiple Choice Questions (0.5 Mark EACH)

1. The following technique is used for intraocular lens power calculation:
 - a) Retinoscopy.
 - b) Indirect ophthalmoscopy.
 - c) B-Scan ultrasonography.
 - d) A-Scan ultrasonography.

2. Landolt's broken rings are used for testing:
 - a) Visual Acuity.
 - b) Angle of squint.
 - c) Visual field.
 - d) Corneal radius of curvature.

3. In indirect Ophthalmoscopy, the image is:
 - a) Real and erect.
 - b) Real and inverted.
 - c) Virtual and inverted.
 - d) Virtual and erect.

4. The image formed by a convex mirror is:
 - a) Real.
 - b) The same size of the object.
 - c) ~~Erect.~~
 - d) Located between F and C.

5. In thin lenses:
 - a) The first principal focus is the point to which parallel light rays converge following refraction by a spherical lens.
 - b) The nodal point is the point at which the principal plane and the principal axis intersect.
 - c) Lens power calculation incorporates an adjustment for lens thickness.
 - d) Vergence power is proportional to focal length.

6. The following is true about prisms:
 - a) The "centrad" measures the image displacement along an arc 1 cm from a prism.
 - b) The "centrad" and "prism diopter" produce the same angle of deviation.
 - c) Prisms may be used in assessment of simulated blindness.
 - d) The Maddox rod is comprised of high powered prisms.

7. The following is true about chromatic aberration:
- Chromatic aberration accounts for 3 diopters of aberration in the human eye.
 - Longer wavelengths are deviated more at an optical interface.
 - The higher the refractive index of a material the higher its dispersive power.
 - Duochrome test is sensitive to a difference of 0.25 diopters.
8. A glasses prescription of + 1.5 DS / - 4.0 DC X 80 is equivalent to:
- 2.5 DS / + 4.0 DC X 80.
 - 2.5 DS / +4.0 DC X 170.
 - + 5.5 DS / - 4.0 DC X 80.
 - 2.5 DS / - 4.0 DC X 170.
9. In Gullstrand's schematic eye, the following is true:
- There are two principal points in the anterior chamber.
 - There are two nodal points in the posterior chamber.
 - Nodal points coincide with the principal points.
 - The first principal point is 3 mm behind the anterior corneal surface.
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10. Near visual acuity is tested using:
- Cambridge chart.
 - Jaeger's test type.
 - Frisby test.
 - Worth's four-dot test.
11. Correction of unilateral aphakia:
- With spectacles causes anisokonia.
 - With spectacles gives a relative spectacle magnification of 1.1.
 - With contact lenses gives a relative spectacle magnification of 1.3.
 - With an intraocular lens gives a relative spectacle magnification of 1.1.
12. The following is true about contact lenses:
- A high plus contact lens has a central thin portion.
 - Hard lenses abolish lenticular astigmatism.
 - The haptic of a scleral lens is the corneal portion.
 - The base curve of a contact lens is the curvature of the central portion of the back surface of the lens.

13. The following is true in subjective refraction:
- Before starting subjective refraction, 1.5 DS should be added to the retinoscopy results.
 - Deducting the working distance helps to reduce the cylinder to about one fourth of its previous value.
 - The fellow eye should be occluded.
 - The power of the cylinder should be corrected first.
14. While calculating the near addition:
- Convex lenses are added to the distance correction to provoke accommodation.
 - The approximate value of the near addition for a subject aged 45 years is 3.0 DS.
 - In general, it is advisable to give the maximum plus lens.
 - The patient should be tested at his / her normal reading distance.
15. The following is true in myopia:
- Myopia can be reduced by flattening the central cornea.
 - Myopia is typically termed "axial" in the case of a patient with an axial length of 23 mm
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- Index myopia is caused when the nucleus of the lens undergoes a reduction in refractive index.
 - The far point of an uncorrected - 2.0 DS myope is at a theoretical distance of 20 cm.
16. A 70 years old patient is prescribed pilocarpine drops in both eyes for the treatment of glaucoma. The following can be expected:
- Reading without glasses is possible due to miosis.
 - Distance vision is blurred due to excessive accommodation.
 - Distance vision is blurred due to miosis.
 - Faster dark adaptation than before.
17. In measuring the corneal curvature:
- There are two types of keratometers: Javal-Schiotz and Placido disc.
 - The central 4 mm of the cornea is assumed to be spherical.
 - Von Helmholtz keratometer uses a fixed image size.
 - The Javal-Schiotz keratometer uses two rotating glass plates to double the image.

18. The Placido disc:
- a) Is a convex disc with concentric black and white rings.
 - b) Has a central aperture in which a concave lens is mounted.
 - c) Is a quantitative measure of corneal curvature.
 - d) Can be used to detect keratoconus.
19. The following is true about keratometers:
- a) The images of the mires are magnified and real.
 - b) The dioptric power of the cornea is inversely related to its radius.
 - c) The central 10 mm of the corneal diameter is measured.
 - d) The image is doubled using a Risely prism.
20. The following term refers to the amount of light arriving at a certain point:
- a) Brightness.
 - b) Shininess.
 - c) Illuminance.
 - d) Radiance.
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