

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (OPHTHALMOLOGY) OPHTHALMIC BASIC SCIENCES
EXAMINATION – APRIL 2023

Date:- 4th April 2023

Time:- 1.00 p.m. – 2.30 p.m.

STRUCTURED ESSAY PAPER I

Answer all three (03) questions.

Answer each question in a separate book (Question 1, 2, 3.1 and 3.2)

1.

1.1. Describe the anatomy of the superior oblique muscle including the trochlea. (80%)

1.2. What are the extra ocular muscle actions that will be affected in superior oblique palsy and the basis of compensatory head posture. (20%)

2.

2.1. Describe the structure of optic chiasma. (20%)

2.2. State the anatomical relations and blood supply of optic chiasma. (30%)

2.3. Briefly describe the neural organization of optic chiasma. (20%)

2.4. Explain the anatomical basis of visual field defects seen in chiasmal compression. (30%)

Contd..../2-

3.

3.1. A 40-year-old man presents to the ophthalmology clinic with features of bitemporal hemianopia. Clinically a lesion at optic chiasma is suspected and a contrast MRI of the brain was performed.

3.1.1. Briefly explain the advantages of the above radiological investigation. (15%)

3.1.2. Outline the contraindications for performing the MRI brain. (20%)

3.1.3. Explain the patient preparation for the MRI brain. (15%)

3.2. A 5-year-old boy is investigated for the genetic basis for his presentation with retinitis pigmentosa, obesity, cardiomyopathy and renal dysfunction. A karyotype was reported as 46,XY. His mother is currently aged 45-years and his father is 55-years. Both parents and his two older sisters are in good health and there is no other family history of note. He has genetic testing using whole exome sequencing. The genetic test reports the presence of a previously described (known) homozygous pathogenic variant in a gene called *ALMS1*.

3.2.1. State two (02) features in a family history that indicates autosomal recessive disease in a pedigree. (10%)

3.2.2. State the type of genetic disorders associated with increased maternal and paternal ages. (10%)

3.2.3. State the difference between the two (02) genetic tests performed on him. (10%)

3.2.4. State the significance of the term homozygous pathogenic sequence variant. (10%)

3.2.5. State two (02) disadvantages of using whole exome sequencing. (10%)

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Date:- 4th April 2023

Time:- 3.00 p.m. – 4.30 p.m.

STRUCTURED ESSAY PAPER II

Answer all three (03) questions.

Answer each question in a separate book (Question 1, 2, 3.1 and 3.2)

1.

- 1.1. What are the layers of the tear film and the composition of each layer? (35%)
- 1.2. List the functions of each layer of the tear film? (35%)
- 1.3. What are the factors required for maintaining the tear film? (15%)
- 1.4. Enumerate the factors that regulate the composition of the components of the tear film. (15%)

2.

- 2.1. Briefly describe the normal visual field and its extent. (20%)
- 2.2. Discuss the physiological basis of perimetry. (40%)
- 2.3. What are the types of perimetric testing? (10%)
- 2.4. Briefly discuss the advantages and disadvantages of each of the above. (30%)

Contd..../2-

3.
 - 3.1. A population-based descriptive cross-sectional study was conducted to quantify the choroidal vascularity index (CVI) and its determinants among adults aged ≥ 35 years residing in a district. The results revealed that the mean CVI was 69.7 (95% Confidence Interval 69.2 to 70.3). After adjusting for other factors, older age was significantly associated with a lower CVI. The CVI decreased by -0.13 (-0.19 to -0.06) with each 1-year increase in age.
 - 3.1.1. Briefly explain a suitable sampling method for the study. (10%)
 - 3.1.2. Interpret the mean CVI and 95% confidence interval. (20%)
 - 3.1.3. Briefly describe the statistical method used to adjust for other factors. (20%)
 - 3.2. A 50-year-old man presented to eye clinic with history of unilateral proptosis of 6 months duration.
 - 3.2.1. List the possible pathological lesions. (15%)
 - 3.2.2. List the sequence of laboratory investigations that you would carry out to come to a diagnosis. (25%)
 - 3.2.3. Outline the use of immunohistochemistry and histochemical stains that are helpful for the diagnosis. (10%)