4/35

0119E563

Candidate's Seat No : _____

First Year B. Optometry Examination

Physical Optics

Date : 21-01-2019, Monday] **[Max. Marks : 80**

[Time : 3 Hours

Instructions : (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

Section A

Q- 1. Answer the following questions by selecting right option/s. **(10)**

(1) If in a transmission grating, total numbers of lines are 15,000 per two inch then grating element would be
(a) 1.6×10^{-4} cm.
(b) 0.8×10^{-4} cm.
(c) 3.3×10^{-4} cm.
(d) 2.3×10^{-4} cm.

(2) If the Phase difference between extraordinary and ordinary Ray is $3\pi/4$ then the light is polarized
(a) Linearly
(b) Elliptically
(c) Circularly
(d) Triangularly

(3) To explain theory of light Huygens assumed the hypothetical medium known as
(a) Space
(b) Wave
(c) Ether
(d) Ethen

(4) When sunlight traverses the earth's atmosphere, scattering observed between sun radiation and submicroscopic particles is
(a) Raman effect
(b) Gullstrand effect
(c) Tyndall effect
(d) Stiles – Crawford effect

(5) The exciting line an experiment is 5460 A^0 and the stoke line is at 5520A^0. The wave length of the anti-stokes line
(a) 5460 A^0
(b) 5520 A^0
(c) 5500 A^0
(d) 5402 A^0

(6) What is the form of wave front associate with a linear light source
(a) Linear
(b) Spherical
(c) Plane
(d) Cylindrical

(7) Zone plate may acts as.....
(a) Bi-Convex lens
(b) Bi-Concave lens
(c) Glass-Sphere
(d) Glass-Slab

(8) In which medium optical path length will be equal to geometrical path length?
(a) Free Space
(b) Denser Medium
(c) Rare Medium
(d) Any Medium

(9) Which laser is / are pulse wave laser/s?
(a) Ruby LASER
(b) CO2 LASER
(c) Semi-Conductor LASER
(d) He-Ne LASER

(10) Ordinary and extra ordinary rays can be separated through..
(a) Tourmaline plate
(b) Herschel'sPrism
(c) Calcite Prism
(d) All the above

Q – 2. Answer the following questions in detail: (ANY FIVE) (30)

(1) Write a note on Lloyd's mirror.

(2) Write a note on young's double slit experiment.

(3) Discuss interference due to reflected light in case of thin films.

(4) Explain zone plate with necessary derivation.

(5) Write a note on nicol prism

(6) Discuss combination of two simple harmonic vibrations which are perpendicular to each other.

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Section B

Q.3. **Answer the following questions by selecting right option/s.** **(10)**

(1) Intensity of transmitted light through analyzer is zero according to Malus's Law when
(a) When two planes are parallel to each other.
(b) When two planes are at 56.9° to each other
(c) When two planes are perpendicular to each other
(d) The phenomena is independent of these

(2) Optical fiber does not consists of
(a) Core
(b) Rack
(c) Cladding
(d) jacket

(3) The final image formed by a astronomical telescope is
(a) Erect.
(b) Inverted.
(c) Sometimes erect sometime inverted
(d) None of these.

(4) In simple harmonic motion kinetic energy of the oscillator is maximum when its amplitude is
(a) Zero
(b) Maximum
(c) Intermediate
(d) Minimum

(5) Which phenomenon is responsible of blue colour of sky?
(a) Diffraction
(b) Reflection
(c) Interference
(d) None of these

(6) Define amplitude of a wave.

(7) What is coherent light?

(8) Define: fluorescence.

(9) What is monochromatic source? Give example.

(10) Define absorption coefficient.

Q. 4. Answer the following questions in detail: (ANY FIVE) (30)

(1) Write a note on mercury vapour lamp.

(2) Explain Raman scattering in detail.

(3) Explain image formation in telescope.

(4) Write note on CO_2 LASER.

(5) Write conditions to obtain total internal reflection in optical fibre and explain structure of optical fibre.

(6) Write basic characteristics of LASER and discuss stimulated-spontaneous emission.

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0119E578

Candidate's Seat No : _____

First Year B. Optometry Examination

Geometrical Optics

Date : 23-01-2019, Wednesday] **[Max. Marks : 80**

[Time : 3 Hours

Instructions : (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

Section A

Q – 1. Answer the following questions by selecting option. **(10)**

1. The most distant point at which an object can be seen clearly is called _____of the eye.

(a) Near point (b) Blind point (c) Far point (d) None of these

2. Modulation transfer function depends on

(a) Amplitude (b) Time (c) Refractive index (d) All of the above

3. Rayleigh's criterion for resolution is based on

(a) Interference (b) Polarization (c) Reflection (d) Diffraction

4. Paraxial schematic eyes are only accurate within the

(a) All regions (c) Tangential region

(b) Paraxial region. (d) Sagittal region

5. _____ is defined as the curvature of a wavefront at a specific distance from the origin, or focus.

(a) Dispersive power (c) Vergence

(b) Aberration (d) None of these

6. Which distribution is used to explain stile Crawford effect?

(a) Gaussian (b) Lagrangian (c) newtonian (d) none of these

7. Select right sentence from given below.

(a) Dispersive power and resolving power are same quantity.

(b) Abbe's number is inverse of dispersive power

(c) Abbe's number is inverse of resolving power

(d) Abbe's number is an inverse of prism diopter.

8. Select wrong sentence from given below.

(a) Lens has two focal points

(b) Radius of curvature of lens depends on refractive index of material.

(c) Lens has only one focal point

(d) COMA and chromatic dispersion are different from each other.

9. Which of the following term is not related with prism
   (a) Cardinal points (c) Abbe's number
   (b) Angle of deviation (d) All of the above
10. Which of the following term is not related with aberration
   (a) Aplanatic lens (c) Achromatic lens
   (b) Anastigmate lens (d) Birefringence

Q – 2. Answer the followings in detail: (any Five out of Six) **(30)**

1. Define and explain cardinal points of an optical system
2. Describe Gullstrand's schematic eyes with detail.
3. Explain accommodation of human eye with necessary terms.
4. Explain reflection and refraction matrix
5. State and prove Knapp's law.
6. Write a note on refractive errors.

Section B

Q3. Answer the following questions by selecting option. **(10)**

1. Which of the following is British unit of intensity of illumination?
   (a) Candela (b) Lambert (c) Foot candle (d) All of the above
2. How many prisms are used in lummer brodhun photometer?
   (a) Four (b) Six (c) Two (d) Three
3. _____ are primarily responsible for night vision (in low intensity).
   (a) Rods (c) Both rods and cones
   (b) Cones (d) None of these
4. A source emits 45 joules of energy in 15 s. What is the radiant flux of the source?
   (a) 3 watt (b) 675 watt (c) 45 watt (d) 0.33 watt
5. From below given matrices select a matrix representing reflection matrix for plane surface

(a) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 0 \\ \frac{2}{r} & -1 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ -\frac{2}{r} & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 0 \\ -\frac{2}{r} & 1 \end{bmatrix}$

6. Which of the following cardinal point for glass sphere are lying at the centre of the glass sphere?
   (a) Principle points and nodal points
   (b) Focal points and pole
   (c) Nodal points and focal points
   (d) None of these.
7. Refractive index of a medium increases with decrease in
   (a) Type of material
   (b) Temperature only
   (c) Wavelength of light only
   (d) Wavelength and temperature both
8. In which of the following aberration image is out of shape only
   (a) Distortion
   (b) Spherical aberration
   (c) COMA
   (d) None of these
9. Lens having radius of curvature $R_1 > 0$ and $R_2 < 0$ are called _____lenses.
   (a) Plano convex
   (b) Plano concave
   (c) Concavo convex
   (d) Biconvex
10. The rays of white fail to converge at a point after going through a converging lens. This defect is called
    (a) Spherical aberration
    (b) Distortion
    (c) Coma
    (d) Chromatic aberration.

Q4 Answer the followings in detail: (any Five out of Six) **(30)**

1. Write a note on lummer brodhun photometer.
2. Write few lines on following terms:
   i. Photometry
   ii. Luminous flux
   iii. Luminous intensity
   iv. Luminance
   v. Photopic, Scotopic and mesopic vision
3. Derive an expression for refractive index of a dispersive prism in position of minimum deviation.
4. Explain COMA with types, formation and elimination.
5. With proper figure explain chromatic aberration derive formula for axial chromatic aberration.
6. Write a note on aplanatic lenses.

0119E591

Candidate's Seat No : _____

First Year B. Optometry Examination

Biochemistry (Basic & Ocu.)

Date : 25-01-2019, Friday] **[Max. Marks : 80**

[Time : 3 Hours

Instructions : (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

Section A : BASIC BIOCHEMISTRY

Q-1 Select the most correct answer by encircling it. **(1 x 10 = 10)**

1. Following is not a reducing sugar
   a. Maltose c. Lactose
   b. Sucrose d. Cellobiose
2. Following is soluble in organic solvent
   a. Glucose c. Wax
   b. Insulin d. Guanine
3. Following is an Omega-3 fatty acid
   a. Linoleic acid c. Arachidonic acid
   b. Acitic Acid d. All of the above
4. Which of the following amino acid is optically inactive:
   a. Threonine c. Tryptophan
   b. Serine d. Glycine
5. Collegen fibers are rich in all of the following except:
   a. Glycine c. Proline
   b. Cysteine d. Lycine
6. Following coenzyme is not a vitamin:
   a. S-adenosyl methionine c. Lipoic acid
   b. Coenzyme-Q d. All of the above
7. An inhibitor that increases Km of an enzyme is:
   a. Competitive c. Uncompetitive
   b. Noncompetitive d. Suicidal
8. Pellagra occurs due to deficiency of:
   a. Biotin c. Riboflavin
   b. Pantothenic acid d. Niacin
9. Vitamin B5 is required for the synthesis of:
   a. Coenzyme A c. Acetyl CoA
   b. Succinyl CoA d. All of the above
10. The nitrogen in urea originates from:
    a. Glutamate and aspartate c. Ammonia and alanine
    b. Ammonia and glutamine d. Alanine and aspartate

Q-2 Answer the following questions in details. (Any Five) **(6 x 5 = 30)**

1. Enzyme inhibition and medical application
2. Plasma proteins
3. Lipoproteins
4. Derived sugars
5. Metabolic disorders
6. Diabetes mellitus

P.T.O.]

0119E591(2)

Section B : OCULAR BIOCHEMISTRY

Q.3. **Select the most correct answer by encircling it.** **(1 x 10 = 10)**

1. Following collagen is predominant in cornea:
   a. Type I c. Type III
   b. Type II d. Type IV
2. GAGs are absent in:
   a. Cornea c. Lens
   b. Sclera d. Conjunctiva
3. Concentration of proteins in aqueous humour is:
   a. 1-10 mg/dl c. 10-20 mg/dl
   b. 5-15 mg/dl d. 15-25 mg/dl
4. Blood ocular barrier are required to prevent entry of:
   a. Proteins c. cAMP
   b. Sugar d. Vitamins
5. Following is true related to lens:
   a. Cortex contains more insoluble proteins than nucleus
   b. Cortex contains more soluble proteins than nucleus
   c. Nucleus contains more soluble proteins than matrix
   d. None of the above
6. True diabetic cataract is also known as_____cataract:
   a. Snow-man c. Snow-wind
   b. Snow-women d. Snow-storm
7. Following mucopollysaccharide is present in vitrous humour:
   a. Hyaluronic acid c. Heparin
   b. Keratan sulfate d. Heparan sulfate
8. Retina gets oxygen from:
   a. Air c. Both of the above
   b. Blood stream d. None of the above
9. Rhodopsin is also known as:
   a. Visual red c. Visual blue
   b. Visual green d. Visual purple
10. Tear film is made up of:
    a. Lipid layer c. Mucus layer
    b. Aqueous layer d. All of the above

Q.4. Answer the following questions in details. (Any Five) **(6 x 5 = 30)**

1. Biochemical pathways occur in lens
2. Vitamin A and its role in vision
3. Tear and tear film
4. Biochemistry of cornea
5. Biochemistry of retina
6. Aqueous and vitreous fluids of the eye

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0119E602

Candidate's Seat No : _____

First Year B. Optometry Examination

Anatomy (Hum. & Ocu.)

[Max. Marks : 80

Date : 28-01-2019, Monday]

[Time : 3 Hours

Instructions : (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

SECTION I

Q-1 Short Questions: *1X10= 10 Marks*

1 Enumerates the types of suture.
2 Give two examples of pneumatic bones and explain the name of sinus.
3 Writes name of Neuroglial cells.
4 Explain the type of Neuron
5 Enumerates the layers of epidermis.
6 Write the types of Epithelium- Alveolus of lung
Small Intestine
7 Explain the hormone secreted by Anterior Pitutary gland?
8 Enumerate name of last 4 cranial nerve
9 Write down any two name of modification of Deep Fascia
10 Define anatomical position of body

Q-2 Short Notes (Five out of six) *5X6= 30 Marks*

1, Mention the type of bone and give example of each type of bone
2, Synovial Joint
3, Anastomosis
4, Skeletal Muscle
5, Deep Fascia
6, Spleen

P.T.O.]

0119 E602 - II

Section II

Q.3. **Choose the correct answer from the options given** (10)

1. Following extraocular muscle is responsible for upward movement of the eye ball :

A. Levator palpebrae superiors muscle
B. Inferior Rectus muscle
C. Superior Rectus muscle
D.Lateral rectus muscle

2. Following structure is responsible for night vision:

A. Lateral geniculate body
B. cones
C. rods
D. Retinal pigment epithelium

3. Cornea is innervated by following cranial nerve:

A. 2nd
B. 5th
C. 7th
D. 3rd

4. Aqueus layer of tear film is secreted by :

A. Goblet cells of conjunctiva
B. Lacrimal gland
C. Meibomian glands
D. Epithelial layer of cornea

5. Following structure of the eye is avascular:

A. Conjunctiva
B. Sclera
C. Cornea
D. Retina

6. Crystalline lens is originated from :

A. Surface ectoderm
B. Mesoderm
C. Endoderm
D. All

7. Aqueus humour of eye is secreted by

A. cornea
B. ciliary body
C. Vitreous humour
D. Choroid

8. During accommodation which structure changes its shape :

A. Cornea
B. Conjunctiva
C. Retina
D. Crystalline lens.

9. Which among the following consist of Binocular Single Vision :

A. simultaneous perception
B. fusion
C. depth perception
D. All

10. Thickest layer of cornea is :

A. Epithelium
B. Stroma
C. Endothelium
D. Desmets membrane

Q.4. **Answer following questions with appropriate diagramme (five out of six)** (30)

1. Anatomy of tear film
2. Binocular single vision
3. Extraocular muscles .
4. Anatomy of cornea
5. Pupillary reflexes
6. Anatomy of Nasolacrimal system

A/35

0119E614

Candidate's Seat No : _____

First Year B. Optometry Examination

Physiology (Hum. & Ocu.)

Date : 30-01-2019, Wednesday] **[Max. Marks : 80**

[Time : 3 Hours

Instructions : (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

SECTION I

Q1. MCQ (write the correct option & answer) **(1x10=10)**

1. Transport across cell membrane that takes place with the help of ATP

   a) Active transport
   b) Diffusion
   c) Endocytosis
   d) Exocytosis

2. Clotting of blood is function of
   a) T lymphocyte
   b) B lymphocyte
   c) RBC
   d) Platelets

3. Neuro glial cells responsible for myelination in central nervous system
   a) Microglia
   b) Oligodendrocytes
   c) Schwann cells
   d) Satellite cells

4. Sensory area for word formation (sensory speech area)
   a) Broca's area
   b) Wernicke's area
   c) Prefrontal lobe
   d) primary motor area

5. Normal pulse rate in adult human beings?
   a) 70-80/min
   b) 60-70/min
   c) 80-90/min
   d) 60-100/min

6. P wave in ECG represents
   a) Atrial depolarisation
   b) Atrial Repolarisation
   c) Ventricular depolarisation
   d) Ventricular Repolarisation

7. If no antigen present in RBC membrane then plasma will have
   a) anti A antibody
   b) No antibody
   c) Anti B antibody
   d) both anti A & anti B antibodies

P.T.O.]

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8. Neurotransmitter in neuromuscular junction is
   a) Dopamine
   b) Adrenaline
   c) Noradrenaline
   d) Acetylcholine

9. Depolarisation in action potential of skeletal muscle develops mainly due to
   a) K leak channels
   b) Na leak channels
   c) Voltage gated K channels
   d) Voltage gated Na channels

10. Primary visual area is present in
   a) Frontal lobe
   b) Occipital lobe
   c) Parietal lobe
   d) temporal lobe

Q 2 Write in brief (any 5 out of 6) **(5x6=30)**

1. Immunity
2. Functions of cerebellum
3. Synapse
4. Visual pathway
5. Cardiac cycle
6. Draw labelled diagram of cell membrane. Write in brief types of transport across cell membrane.

0119E614 – III

Section – II
Ocular Physiology

Q-3 Multiple choice question / Fill in the blanks / True/ False (10)

1. Colour of Cornea is
   a. Black
   b. Transperant
   c. Brown
   d. Green

2. Aqueous humer is secreted by
   a. ciliary body
   b. Pupil
   c. Schlems canel
   d. cornea

3. Normal range of intraocular pressure
   a. 5 to 10 mm of Hg
   b. 10.5 to 20.5 mm of Hg
   c. 20 to 30 mm of Hg
   d. 1 to 5 mm of Hg

4. Schermers test is for
   a. to measure IOP
   b. to see corneal epithelial defect
   c. for dry eye
   d. to see corneal sensations

5. Primary action of superier rectus muscle is
   a. elevation
   b. Adduction
   c. intorsion
   d. Abduction

6. Colour vision is due to
   a. Rods
   b. Cones
   c. Ganglion cell
   d. All of above

7. Fovea is not the most sensitive part of retina. (True/False)

8. Normal Blinking rate of lids per minute is
   a. 10 to 16
   b. 0 to 5
   c. 5 to 10
   d. 20 to 25

9. Near vision complex consist of
   a. accomodation
   b. Miosis
   c. Convergence
   d. All of the above

10. After the age of 40 accomodation power of eye reduces due to inelasticity of lens. (True / False)

Q-4 Write the notes any five with details and Diagram (30)

1. Factors affecting corneal transperancy
2. Functions of Lid
3. Action of extra ocular muscles
4. Equeous humer, its secretion & its drainage
5. Colour vision & test for colour blindness
6. Binocular single vision & its Stages