

Program	Bachelor of Optometry	
Subject Name	Ocular Physiology	Semester II
Time: 2 Hour	Year June 2024	
Max. Marks: 50	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Two out of Four of Section C Possession of Mobile Phones or any kind of Written Material, Arguments with the Invigilator or Discussing with Co-Student will come under Unfair Means and will Result in the Cancellation of the Papers. 	

Knowledge Level (KL)	K1: Remembering	K3: Applying	K5: Evaluating
	K2: Understanding	K4: Analysing	K6: Creating

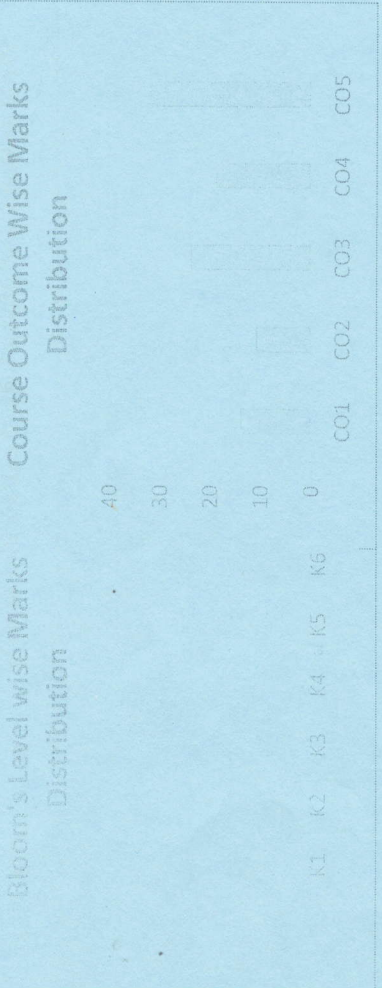
Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	The corneal endothelium lines a) Posterior aspect of Bowman's membrane b) Anterior aspect of Bowman's membrane c) Anterior aspect of descemet's membrane d) Posterior aspect of descemet's membrane.	01	CO1	K2
ii	Secondary action of superior oblique is a) Intorsion b) Extorsion c) Depression d) elevation	01	CO3	K3
iii	Accommodation leads to a) Tension of zonules b) Relaxation of zonules c) Disappearance of zonules d) Appearance of zonules.	01	CO2	K2
iv	In which of the following reflexes the pupil dilates a) Light reflex b) Near reflex c) Psychosensory reflex d) All of these.	01	CO3	K3
v	The size of normal pupil is a) 2-4 mm b) 5-8 mm c) 1-2 mm d) None of these.	01	CO1	K1

CO1	Identify various tools and have basic implementation skills.
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CO5	Evaluate & verify the IoT data in the cloud and in between cloud providers.

Knowledge Level (KL)	K1: Remembering	K3: Applying	K5: Evaluating
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GRAFICAL REPRESENTATION



Section C (Answer any TWO out of FOUR) - 20Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Evaluate how is aqueous produced? Discuss its "flow" path and how is it eliminated (drained out) from the eye.	10	CO5	K5
9	Describe anatomy of visual pathway with diagram.	10	CO4	K2
10	Evaluate the methods of Tear film assessment and treatment of dry eye	10	CO4	K5
11	Write anatomy and physiology of extraocular muscle.	10	CO2	K2

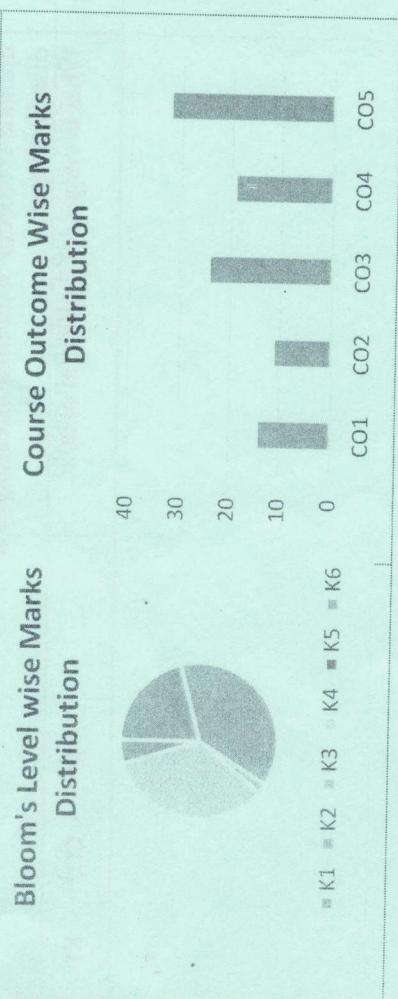
vi	The intraocular pressure is measured by a) Perimeter b) Pachometer c) Tonometer d) Keratometer.	01	CO2	K5
vii	The amount of water present in cornea is a) 60% b) 78% c) 90% d) 20%.	01	CO1	K1
viii	The muscle responsible for blinking of eyes is a) Medial rectus b) Ciliary muscle c) Sphincter pupillae d) Orbicularis oculi	01	CO3	K3
ix	The line joining all the points that stimulate corresponding points of retina is a) Phoropter b) Horopter c) Isopter d) None of these.	01	CO3	K1
x	Colour vision is due to a) Rod cells b) Muller cells c) Cone cells d) None of these.	01	CO2	K3

Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain anatomy and physiology of cornea.	05	CO2	K1
3	Summarize developmental anatomy of vitreous body, How age effects it?	05	CO5	K3
4	Describe anatomy of lacrimal apparatus with diagram.	05	CO4	K2
5	Explain physiology of binocular vision	05	CO2	K1
6	Discriminate different types of colour vision defect.	05	CO5	K4
7	Illustrate various component of tear film	05	CO2	K2

Program	Bachelor of Optometry	
Subject Name	Geometric Optics -II	Semester II
		Year June 2024
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CO1	Identify various tools and have basic implementation skills.
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Knowledge Level (KL)	K1 : Remembering K3 : Applying K5 : Evaluating K2 : Understanding K4 : Analysing K6 : Creating



Q. N1	QUESTIONS	Marks	COs	KL
i	Total hypermetropia is a) Facultative + absolute b) Manifest + Latent c) Manifest + absolute d) Absolute + latent	01	CO1	K3
ii	What is the pumping source in Ruby laser? a) Electrical Pumping b) Optical Pumping c) Chemical Pumping d) None of the above	01	CO2	K2
iii	An increase in axial length of the eye will cause a) Myopia b) Hypermetropia c) Astigmatism d) Presbyopia	01	CO1	K2
iv	When atom is expose to radiation having a stream of photons each with energy $h\nu$, then the following processes can take place a) Absorption b) Stimulated emission c) Spontaneous emission d) All of them	01	CO3	K1
V	infants are born with a) Myopia	01	CO2	K2

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Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Define astigmatism. Write down different refractive types of astigmatism and Treatments of astigmatism.	10	CO1	K2
9	With the help of diagram state the position of cardinal points on schematic eye of Gullstrand. What is the reduced eye of Donder?	10	CO4	K1
10	Briefly describe different modalities available for aphakia correction with their advantages & disadvantages.	10	CO2	K5
11	What is vergence? Explain in details.	10	CO3	K1

vi	b) Hypermetropia c) Astigmatism d) Emmetropia	01	CO3	K4
vii	The spontaneous emission produces a) Coherent light b) Incoherent light c) White light d) None of the above	01	CO3	K4
viii	Laser system does not include a) Active medium b) Incoherent light c) White light d) None of the above	01	CO3	K5
ix	Magnification of +40D lens is a) 4x b) 10x c) 20x d) 40x	01	CO3	K5
x	Ruby laser is a solid state laser, the active medium is a) Crystalline substance b) Non crystalline substance c) Gaseous substance d) None of the above	01	CO1	K2
	A X8 loupe has an equivalent power of _____ dioptries. a) 2 b) 8 c) 16 d) 32	01	CO3	K5

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain anisometropia and Pseudophakia.	05	CO2	K1
3	Classify different types of myopia.	05	CO4	K4
4	Classify types of hypermetropia, clinical features and management.	05	CO4	K2
5	Discuss in detail the anomalies of accommodation and the management.	05	CO2	K5
6	In laser what is meant by an active medium?	05	CO3	K2
7	Using a block diagram, explain the basic lasing action.	05	CO3	K1

JGI	Program	Bachelor of Optometry
	Subject Name	Ocular Biochemistry.
		Semester II Year June 2024
	Time: 2 Hour Max. Marks: 50	<ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Two out of Four of Section C Possession of <u>Mobile Phones</u> or any kind of <u>Written Material, Arguments with the Invigilator or Discussing with Co-Student</u> will come under <u>Unfair Means</u> and will <u>Result in the Cancellation of the Papers.</u>

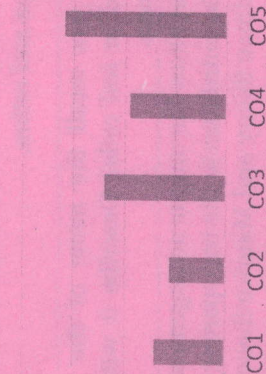
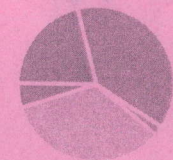
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks			
Q. N1	QUESTIONS	Marks	COs KL
i	What is the primary structural protein found in the cornea? a) Collagen b) Elastin c) Keratin d) Myosin	01	CO2 KL2
ii	Which vitamin is essential for the synthesis of rhodopsin in the retina? a) Vitamin A b) Vitamin C c) Vitamin D d) Vitamin E	01	CO1 KL1
iii	Which enzyme is responsible for the conversion of ATP to cAMP in the process of aqueous humor production? a) Adenylate cyclase b) Acetyl cholinesterase c) Carbonic anhydrase d) Glutathione peroxidase	01	CO1 KL1
iv	What is the primary lipid component of the tear film? a) Cholesterol b) Phospholipids c) Triglycerides d) Fatty acids	01	CO2 KL2

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GRAFICAL REPRESENTATION

Bloom's Level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Why is it important for the cornea to be avascular?	05	CO2	KL2
3	Explain the role of visual pigments in the phototransduction process.	05	CO2	KL2
4	Describe the biochemical processes involved in the visual cycle, from light absorption to signal transduction in the retina.	05	CO2	KL2
5	Describe the composition and function of the extracellular matrix in ocular tissues such as the cornea and retina.	05	CO2	KL2
6	Can you recall the name of the visual pigment found in rod cells? Describe it with the help of a diagram.	05	CO2	KL2
7	Explain how the unique arrangement of collagen fibrils contributes to the transparency of the cornea (Goldman theory and Maurice theory).	05	CO2	KL2

Section C (Answer any TWO out of FOUR) – 20 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS *	Marks	COs	KL
8	The cornea, a transparent outer layer of the eye, primarily consists of a protein crucial for structural integrity and clarity. Identify this protein and explain how its arrangement contributes to corneal transparency.	10	CO3	KL3
9	How would you apply the principles of ocular biochemistry to design a nutritional supplement to support eye health?	10	CO4	KL4
10	Compare and contrast the biochemical pathways involved in the synthesis and degradation of the corneal protein and its implications for corneal health.	10	CO2	KL2
11	Describe colloids and different procedures for making colloids	10	CO3	KL3

v	Which of the following is NOT a component of the aqueous humor in the eye? a) Glucose b) Sodium chloride c) Urea d) Ascorbic acid	01	CO3	KL3
vi	Which enzyme is responsible for the conversion of retinol to retinal in the visual cycle? a) Retinol dehydrogenase b) Retinal isomerase c) Retinol oxidase d) Retinal reductase	01	CO2	KL2
vii	In the aqueous humor, the primary function of ascorbic acid (Vitamin C) is to: a) Maintain osmotic balance b) Act as an antioxidant c) Promote aqueous humor production d) Facilitate neurotransmission	01	CO2	KL2
viii	Which of the following is a major structural protein found in the sclera of the eye? a) Keratin b) Elastin c) Collagen d) Actin	01	CO2	KL2
ix	Which amino acid is abundant in the crystalline lens and contributes to its transparency? a) Glycine b) Proline c) Glutamine d) Tryptophan	01	CO3	KL3
x	How does oxidative stress contribute to the development of age-related macular degeneration (AMD)? a) By promoting inflammation in the retina b) By causing damage to photoreceptor cells c) By disrupting the function of the retinal pigment epithelium d) By increasing the production of vascular endothelial growth factor (VEGF)	01	CO3	KL3

Program	Bachelor of Optometry
Subject Name	Ocular Anatomy.
Semester	II
Year	June 2024

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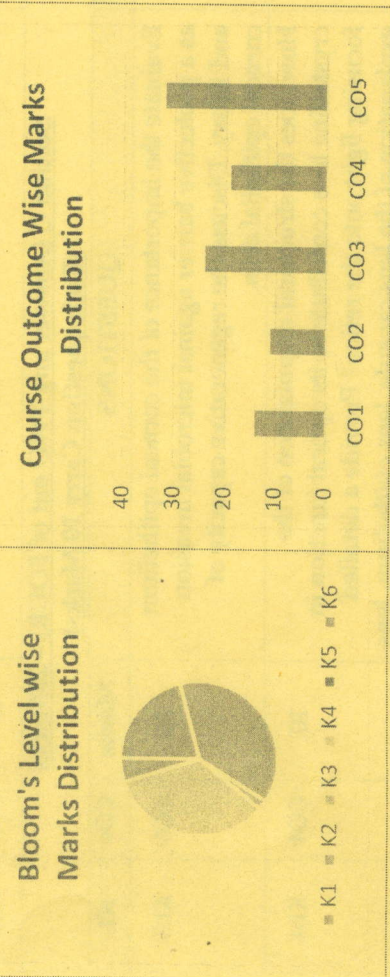
Knowledge Level (KL)	K1 : Remembering	K3 : Applying	K5 : Evaluating
	K2 : Understanding	K4 : Analysing	K6 : Creating

Section A (Each question Carry 01 Marks from Q1-i to x) – 10 Marks

Q. N1	QUESTIONS	Marks	COs	KL
i	Which layer of the cornea is responsible for maintaining its transparency? a) Epithelium b) Bowman's layer c) Stroma d) Endothelium	01	CO2	KL2
ii	What is the function of Bowman's layer in the cornea? a) Nutrient transport b) Nerve sensation c) Structural support d) Pigment protection	01	CO1	KL1
iii	What is the primary function of the human lens? a) To control the amount of light entering the eye b) To produce aqueous humour c) To detect colour vision d) To focus light onto the retina	01	CO1	KL1
iv	Which structure surrounds the human lens and holds it in place within the eye? a) Retina b) Sclera c) Ciliary body d) Fovea centralis	01	CO2	KL2

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GRAFICAL REPRESENTATION



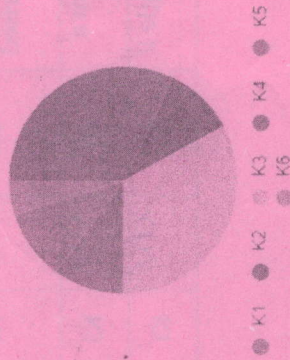
v	If the ciliary muscles contract, what change occurs in the lens? a) Lens becomes more rounded b) Lens becomes flatter c) Lens shifts anteriorly d) The lens becomes opaque	01	CO3	KL3
vi	How does the aqueous humour contribute to maintaining intraocular pressure within the eye? a) By providing nutrients to the lens b) By exerting pressure against the cornea c) By filling the posterior chamber of the eye d) By circulating and draining through the trabecular meshwork	01	CO2	KL2
vii	What is the function of the ciliary body? a) To produce aqueous humour b) To focus the lens for near vision c) To transmit visual signals to the brain d) To detect light intensity	01	CO2	KL2
viii	Which of the following structures is NOT a part of the ciliary body? a) Ciliary processes b) Ciliary muscles c) Sclera d) Pars plana	01	CO2	KL2
ix	Which of the following describes the location of the lens within the eye? a) Posterior to the iris b) Anterior to the iris c) Adjacent to the cornea d) Within the vitreous humour	01	CO3	KL3
x	Which structure of the lens is responsible for changing its shape to facilitate accommodation? a) Capsule b) Cortex c) Nucleus d) Zonules	01	CO3	KL3
Section B (Answer any FOUR out of SIX) - 20 Marks (Each question Carry 5 Marks)				
2. No.	QUESTIONS	Marks	COs	KL
2	Describe the microscopical arrangement of the corneal stroma.	05	CO2	KL2
3	Briefly discuss the structure of the human crystalline lens in detail.	05	CO2	KL2

4	Describe the two theories of accommodation (Goldman and Helmholtz theory), with an appropriate diagram for the same.	05	CO2	KL2
5	Briefly discuss the structural layers present in the sclera. Also, discuss the microscopical structures present in it.	05	CO2	KL2
6	Describe the muscular fiber arrangement in the ciliary muscles. Mention the roles of those individual fibers in a tabulated format.	05	CO2	KL2
7	Describe the anatomy of Vitreous humour.	05	CO2	KL2
Section C (Answer any TWO out of FOUR) - 20 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Evaluate the importance of the corneal epithelium as a protective barrier against microbial invasion and injury. Discuss the regenerative capacity of corneal epithelial cells.	10	CO3	KL3
9	How does the structural organization of the crystalline lens contribute to its optical function in focusing light onto the retina? Provide a detailed explanation of the lens capsule, lens epithelium, lens fibres, and their arrangement, and then discuss how alterations in these structures could impact the refractive properties of the lens	10	CO4	KL4
10	Describe the structure of the human orbit in detail. Also, list down the names and position of the bones in the orbit.	10	CO2	KL2
11	Describe the process of eye development from the embryonic stage to fetal development, focusing on the formation of the optic vesicle, optic cup, and optic fissure closure.	10	CO3	KL3

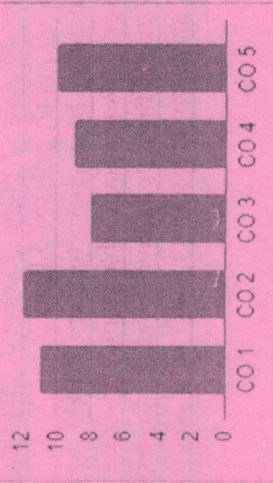
CO1	Understand concepts and theories of light, its nature & properties
CO2	Understand concepts & theories of interference, polarization & diffraction
CO3	Understand concepts & operations of various optical instruments
CO4	Understand concepts of Laser & Radiometry
CO5	Gain knowledge about photometric units
Knowledge Level (KL)	K1 : Remembering K2 : Understanding K3 : Applying K4 : Analysing K5 : Evaluating K6 : Creating

GRAPHICAL REPRESENTATION

Bloom's Level Wise Marks Distribution



Course Outcome-Wise Marks Distribution



Program Bachelor of Optometry

Subject Name Physical Optics

Semester II

Year June 2024

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Time: 2 Hour
Max. Marks : 50

Section A (Each question Carry 01 Mark from Q1-i to x) – 10 Marks

Q. N 1	QUESTIONS	Marks	COs	KL
i	The condition for constructive interference of two coherent beams is that the path difference should be a) Even integral multiple of $\lambda/2$ b) Even integral multiple of $\lambda/3$ c) Odd integral multiple of $\lambda/2$ * d) Odd integral multiple of λ	01	CO 2	K2
ii	Which process gives the laser its special properties as an optical source? a) Dispersion b) Stimulated absorption c) Spontaneous emission d) Stimulated emission	01	CO 2	K5
iii	From the phenomenon of interference it is evident that a) The speed of light is very large b) Light is electromagnetic in nature c) Light obeys conservation of energy d) Light is a transverse wave	01	CO 3	K5
iv	The ratio of phase difference to the path difference between two light waves is a) $2\pi/\lambda$ b) $2\pi\lambda$ c) $\lambda/(2\pi)$ d) $1/(2\pi\lambda)$	01	CO 3	K3

Wavelength of light of frequency 100 Hz is a) 2×10^6 m b) 4×10^6 m c) 3×10^6 m d) 5×10^6 m	01	CO1	K3
The property of coherent sources is a) Equal phase differences over a period of time. b) Equal or nearly equal amplitude c) both wave of the same wavelength d) none of the above	01	CO3	CO 2
What should be the phase difference between the two plane-polarized waves, vibrating at right angles to each other, to produce circularly polarized light? a) $\pi/6$ b) $\pi/2$ c) $\pi/4$ d) $\pi/3$	01	CO1	CO 2
If the polarising angle for a material is 60° , then the refractive index of the material will be a) $1/\sqrt{3}$ b) $3/2$ c) $\sqrt{3}$ d) $\sqrt{3}/2$	01	CO3	CO 3
The locus of all points in a medium having the same phase of vibration is called a) Crest b) Trough c) Wavelength d) Wave front	01	CO3	CO 3
Mauls law states that a) $I = I \cos^2 \theta$ b) $I = I^2 \cos \theta$ c) $I = I \sin^2 \theta$ d) $I = I^2 \sin \theta$	01	CO4	CO1

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
	What is birefringence?	05	CO1	K3
	What is Fraunhofer diffraction? Explain fluorescence & phosphorescence.	05	CO2 CO3	K2 K4

5	What is diffraction grating? State a few of its applications.	05	CO 2	K1
6	What is SHM?	05	CO 3	K3
7	Explain Parallel position & Crossed position.	05	CO 4	K1
Section C (Answer any TWO out of FOUR) – 20 Marks (Each question Carry 10 Marks)				
Q. No.	QUESTIONS	Marks	COs	KL
8	Derive the relationship between Einstein's A & B coefficients.	10	CO 2	K4
9	Derive the mathematical expression for the production of plane polarised, elliptically polarised & circularly polarised light.	10	CO 2	K1
10	State the basic characteristics of light output from a laser. Also explain what population inversion is.	10	CO 3	K3
11	What is Brewster's law? Find the Brewster's angle if light is travelling from water ($n=1.33$) into air.	10	CO 3	K1