INI CET Ophthalmology

Sample Paper – 7

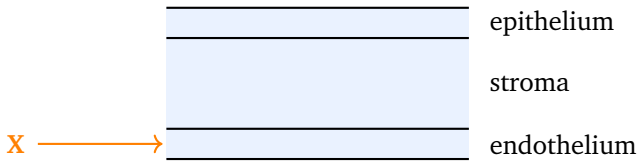
Duration: 14 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **15** Multiple Choice Questions (Single Best Response), modelled on the Ophthalmology content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- The **15-question** length matches the number of Ophthalmology items you actually meet in the real 200-question paper.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **14 minutes**, the pace the real computer-based test demands.

Cornea, Conjunctiva and Anterior Segment

Q1. The cross-section below shows the layers of the cornea. The innermost single-cell layer marked **X**, which rests on Descemet membrane and actively pumps fluid out of the stroma to keep the cornea clear, is the:



(A) Corneal endothelium

(B) Bowman layer

(C) Corneal epithelium

(D) Stroma (substantia propria)

Q2. A grey-white ring of lipid deposited at the corneal periphery, separated from the limbus by a clear zone and seen as a common ageing change in the elderly, is called:

(A) Arcus senilis

(B) Kayser-Fleischer ring

(C) Band keratopathy

(D) Pterygium

Q3. A patient with a facial (seventh) nerve palsy cannot close the eyelids fully (lagophthalmos). The exposed lower cornea dries out and develops punctate epithelial breakdown. This complication is:

(A) Acute angle-closure glaucoma

(B) Exposure keratopathy

(C) Anterior uveitis

(D) Bacterial conjunctivitis

Lens and Glaucoma

Q4. During accommodation to view a near object the ciliary muscle contracts. The effect of this contraction on the zonules and the crystalline lens is:

(A) The zonules tighten and the lens flattens, reducing its power

(B) The lens moves backwards without changing shape

(C) The zonules relax and the lens becomes more convex, increasing its power

(D) The pupil dilates and the lens power falls

Q5. A patient shows progressive glaucomatous optic disc cupping and arcuate field loss, yet the intraocular pressure is repeatedly within the normal range (below 21 mmHg). The most likely diagnosis is:

(A) Acute angle-closure glaucoma

(B) Normal-tension glaucoma

(C) Ocular hypertension

(D) Immature cataract

Q6. Aqueous humour is actively secreted by the ciliary epithelium, a process that depends on the enzyme carbonic anhydrase. A carbonic anhydrase inhibitor such as acetazolamide lowers intraocular pressure mainly by:

(A) Increasing outflow through the trabecular meshwork

(B) Constricting the pupil to open the drainage angle

(C) Dilating the episcleral veins

(D) Reducing aqueous production by the ciliary body

Retina and Vitreous

Q7. Optical coherence tomography (OCT) is especially valuable in the assessment of macular disease because it:

(A) Measures intraocular pressure without contact

(B) Records the electrical response of the retina

(C) Maps the curvature of the corneal surface

(D) Gives cross-sectional images of the retinal layers, detecting fluid and thickness changes

Q8. An elderly patient reports the sudden onset of floaters, and a ring-shaped opacity (a Weiss ring) is seen floating in front of the optic disc, with no retinal tear on examination. The most likely diagnosis is:

(A) Posterior vitreous detachment

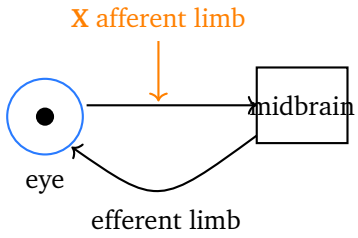
(B) Rhegmatogenous retinal detachment

(C) Central retinal vein occlusion

(D) Mature cataract

Neuro-ophthalmology and Optics

Q9. The schematic below traces the pupillary light reflex. Light detected by the retina travels along the afferent limb (marked **X**) to the midbrain, and the efferent limb then constricts the pupil. The afferent and efferent limbs of this reflex are, respectively:



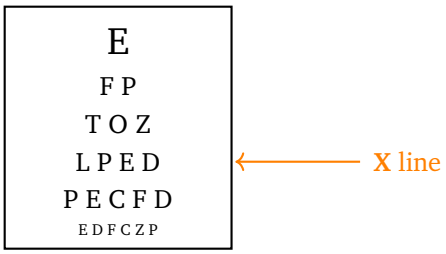
(A) Third nerve (afferent) and optic nerve (efferent)

(B) Optic nerve (afferent) and third nerve via the Edinger-Westphal nucleus (efferent)

(C) Trigeminal nerve (afferent) and facial nerve (efferent)

(D) Facial nerve (afferent) and optic nerve (efferent)

Q10. On the Snellen chart shown, a patient standing at 6 metres reads the line marked **X** that a normal-sighted person also reads at 6 metres. The patient's visual acuity is recorded as:



(A) 6/6, which is normal vision

(B) 6/60, which is severely reduced vision

(C) 6/36, which is moderately reduced vision

(D) 3/6, indicating better-than-normal vision

Q11. Nystagmus in which a slow drift in one direction is followed by a fast corrective movement in the opposite direction, and which is named by the direction of the fast phase, is classified as:

(A) Pendular nystagmus, typical of a purely sensory (congenital) visual defect

(B) Physiological convergence movement

(C) Jerk nystagmus, which points to a vestibular or central (cerebellar or brainstem) cause

(D) Ocular flutter of purely refractive origin

Uvea, Orbit and Ocular Adnexa

Q12. The commonest benign primary orbital tumour in adults, presenting as a slowly progressive axial proptosis, is:

(A) Rhabdomyosarcoma

(B) Cavernous haemangioma

(C) Retinoblastoma

(D) Optic nerve glioma

Q13. The commonest malignant tumour of the eyelid, typically arising on the lower lid as a slow-growing nodule with a pearly rolled edge and central ulceration, is:

(A) Sebaceous gland carcinoma

(B) Squamous cell carcinoma

(C) Malignant melanoma

(D) Basal cell carcinoma

Paediatric Ophthalmology and Emergencies

Q14. A newborn presents with a bluish, tense cystic swelling just below the medial canthus, present since birth and caused by fluid trapped in the lacrimal sac by a block at both ends of the nasolacrimal drainage system. This is a:

(A) Chalazion

(B) Capillary haemangioma

(C) Congenital dacryocystocele (amniotocele)

(D) Preseptal cellulitis

Q15. A patient has a rhegmatogenous retinal detachment in which the macula is still attached ('macula-on'). The correct approach to timing of surgery is:

(A) Elective repair over the next few weeks, as timing does not affect outcome

(B) Repair only once the macula has detached

(C) Urgent repair, because prompt surgery before the macula detaches preserves central vision

(D) Observation with spectacles alone

Detailed Solutions

Q1.

Solution

Concept – the layers of the cornea: From front to back the cornea has five layers: epithelium, Bowman layer, stroma, Descemet membrane and endothelium.

Step 1 – identify layer X: The innermost single-cell layer, lying on Descemet membrane and marked **X**, is the **corneal endothelium**.

Step 2 – its function: Endothelial cells run an active pump that continuously moves fluid out of the stroma, keeping the cornea relatively dehydrated and therefore transparent.

Step 3 – what its failure causes: When endothelial cells are lost (they do not regenerate), the pump fails, the stroma imbibes water and the cornea develops oedema and clouding.

Why the other options are wrong:

- B, Bowman layer: is an acellular layer beneath the epithelium, not the innermost pump layer.
- C, epithelium: is the *outermost* layer and does not pump stromal fluid.
- D, stroma: is the thick middle collagen layer, the very tissue kept dehydrated by the endothelium.

Final Answer: Corneal endothelium $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q1

Q2.

Solution

Concept – age-related corneal deposits: Lipid can deposit in the peripheral cornea as a normal part of ageing.

Step 1 – name the sign: A grey-white ring at the corneal periphery, separated from the limbus by a clear zone, is **arcus senilis**.

Step 2 – its significance: In the elderly it is a benign ageing change; when it appears in a younger patient (arcus juvenilis) it may prompt a check for hyperlipidaemia.

Why the other options are wrong:

- B, Kayser-Fleischer ring: is a copper ring in Descemet membrane seen in

Wilson disease, not an ageing change.

- C, band keratopathy: is calcium deposited in a band across the exposed cornea, linked to chronic inflammation or hypercalcaemia.
- D, pterygium: is a fleshy conjunctival growth encroaching onto the cornea, not a peripheral lipid ring.

Final Answer: Arcus senilis ⇒ A

Answer: (A) Go Back to Q2

Q3.

Solution

Concept – exposure keratopathy: The eyelids and blink spread the tear film; if the cornea cannot be covered it dries out.

Step 1 – link the cause: A facial (seventh) nerve palsy weakens orbicularis oculi, so the lids fail to close fully (lagophthalmos) and the lower cornea is left exposed.

Step 2 – name the result: The exposed cornea dries, and punctate epithelial breakdown of the lower third defines **exposure keratopathy**.

Step 3 – management principle: Ocular lubricants, taping or a moisture chamber protect the cornea until lid closure recovers or is surgically restored.

Why the other options are wrong:

- A, angle-closure glaucoma: is a sudden painful red eye from raised pressure, unrelated to lid closure.
- C, anterior uveitis: is intraocular inflammation with photophobia and a small pupil, not a drying surface problem.
- D, bacterial conjunctivitis: gives a sticky discharge, not the dry exposure pattern of a lid-closure defect.

Final Answer: Exposure keratopathy ⇒ B

Answer: (B) Go Back to Q3

Q4.

Solution

Concept – the mechanism of accommodation: Accommodation increases the eye's power to focus on near objects by changing the shape of the lens.

Step 1 – the muscle action: When the **ciliary muscle contracts**, the ciliary ring narrows and moves towards the lens.

Step 2 – the effect on the zonules: This **relaxes the zonular fibres** (suspensory ligament) that normally hold the lens under tension.

Step 3 – the effect on the lens: Freed from tension, the elastic lens becomes **more convex (rounder)**, so its refractive power rises and near objects come into focus.

Why the other options are wrong:

- A, zonules tighten and lens flattens: describes the relaxed state for distance vision, the opposite of accommodation.
- B, lens moves backwards: accommodation changes lens shape, not simply its position.
- D, pupil dilates: the near reflex actually *constricts* the pupil, and lens power rises rather than falls.

Final Answer: Zonules relax and the lens becomes more convex $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q4

Q5.

Solution

Concept – normal-tension glaucoma: Glaucoma is defined by a progressive optic neuropathy, not by pressure alone.

Step 1 – read the clues: There is genuine glaucomatous cupping and arcuate field loss, yet the intraocular pressure stays below 21 mmHg on repeated measurement.

Step 2 – name the entity: Glaucomatous damage occurring with a statistically normal pressure is **normal-tension glaucoma**, thought to reflect a disc vulnerable to pressure or poor optic-nerve perfusion.

Why the other options are wrong:

- A, angle-closure glaucoma: is an acute painful high-pressure event, not a normal-pressure chronic neuropathy.

- C, ocular hypertension: is raised pressure *without* disc or field damage, the reverse of this picture.
- D, immature cataract: causes gradual blur but no cupping or field defect.

Final Answer: Normal-tension glaucoma ⇒ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – aqueous humour dynamics: Intraocular pressure depends on the balance between aqueous production and its outflow.

Step 1 – where aqueous is made: The **ciliary epithelium** actively secretes aqueous humour, a process that depends on the enzyme **carbonic anhydrase**.

Step 2 – how the drug works: A carbonic anhydrase inhibitor such as acetazolamide (or topical dorzolamide) blocks this enzyme, so the ciliary body **makes less aqueous**, and the pressure falls.

Why the other options are wrong:

- A, increasing trabecular outflow: is the action of pilocarpine and prostaglandin analogues, not of a carbonic anhydrase inhibitor.
- B, constricting the pupil: describes miotics used in angle closure, a different mechanism.
- C, dilating episcleral veins: is not how these drugs act and would tend to impede, not aid, drainage.

Final Answer: Reducing aqueous production by the ciliary body ⇒ D

Answer: (D) Go Back to Q6

Q7.

Solution

Concept – optical coherence tomography (OCT): OCT uses reflected light to build high-resolution cross-sections of ocular tissue.

Step 1 – what it shows: At the macula it gives **cross-sectional images of the individual retinal layers**, revealing intraretinal or subretinal fluid, macular thickness and structural changes.

Step 2 – why it matters: It is central to diagnosing and monitoring diabetic

macular oedema, age-related macular degeneration and macular holes, and to guiding anti-VEGF treatment.

Why the other options are wrong:

- A, measuring pressure: is done by tonometry, not OCT.
- B, recording electrical responses: describes electroretinography, a different test.
- C, mapping the cornea: is corneal topography, not a retinal cross-section.

Final Answer: Cross-sectional imaging of the retinal layers $\Rightarrow$ D

Answer: (D) Go Back to Q7

Q8.

Solution

Concept – posterior vitreous detachment (PVD): With age the vitreous gel liquefies and separates from the retina.

Step 1 – read the clues: Sudden floaters in an elderly patient, with a ring-shaped opacity (a **Weiss ring**) floating in front of the disc, indicate that the vitreous has pulled away from around the optic disc.

Step 2 – name it: This is a **posterior vitreous detachment**; the Weiss ring is the detached ring of condensed vitreous formerly attached at the disc margin.

Step 3 – benign versus warning: An uncomplicated PVD is benign, but because traction can tear the retina, new floaters or flashes warrant a careful dilated examination to exclude a retinal tear.

Why the other options are wrong:

- B, retinal detachment: would give a field defect or curtain, not just floaters with a Weiss ring and no tear.
- C, retinal vein occlusion: causes sudden painless visual loss with fundus haemorrhages, not a Weiss ring.
- D, mature cataract: is a gradual painless blur, not the sudden onset of floaters.

Final Answer: Posterior vitreous detachment $\Rightarrow$ A

Answer: (A) Go Back to Q8

Q9.

Solution

Concept – the pupillary light reflex arc: The reflex has a sensory (afferent) limb and a motor (efferent) limb that meet in the midbrain.

Step 1 – the afferent limb (X): Light is detected by the retina, and the signal travels along the **optic nerve** to the pretectal nucleus in the midbrain. This is the limb marked **X**.

Step 2 – the efferent limb: From the pretectum the signal reaches the **Edinger-Westphal nucleus**, whose parasympathetic fibres run in the **third (oculomotor) nerve** to the ciliary ganglion and then constrict the sphincter pupillae.

Step 3 – put it together: The afferent limb is the optic nerve and the efferent limb is the third nerve via the Edinger-Westphal nucleus.

Why the other options are wrong:

- A, third then optic: reverses the correct order of the two limbs.
- C, trigeminal and facial: is the arc of the corneal (blink) reflex, not the light reflex.
- D, facial afferent: the facial nerve is not the sensory limb for the light reflex.

Final Answer: Optic nerve (afferent) and third nerve (efferent) $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q9

Q10.

Solution

Concept – Snellen visual acuity notation: Acuity is written as a fraction: the test distance over the distance at which a normal eye reads that line.

Step 1 – read the numerator: The patient is tested at **6 metres**, so the top number is 6.

Step 2 – read the denominator: A normal-sighted person also reads the line marked **X** at 6 metres, so the bottom number is 6.

Step 3 – state and interpret it: The acuity is **6/6**, which is normal (standard) vision.

Why the other options are wrong:

- B, 6/60: means the patient reads at 6 m only what a normal eye reads at 60 m, far worse than shown.

- C, 6/36: is moderately reduced acuity, not the matched 6-metre line described.
- D, 3/6: is not standard notation here; the test distance is fixed at 6 m, so the numerator is 6.

Final Answer: 6/6, normal vision $\Rightarrow$ A

Answer: (A) Go Back to Q10

Q11.

Solution

Concept – classifying nystagmus: Nystagmus is described by the pattern of its eye movements.

Step 1 – read the movement pattern: A **slow drift** in one direction followed by a **fast corrective saccade** in the opposite direction, with the two phases unequal, defines **jerk nystagmus**.

Step 2 – naming convention: Jerk nystagmus is named by the direction of its *fast* phase.

Step 3 – localisation: This pattern typically points to a **vestibular or central (cerebellar or brainstem)** cause, unlike pendular nystagmus.

Why the other options are wrong:

- A, pendular nystagmus: has equal-speed to-and-fro movements without a fast and slow phase, so it does not match.
- B, physiological convergence: is a normal near-vision movement, not nystagmus.
- D, ocular flutter of refractive origin: is not a recognised entity; refractive error does not cause this jerk pattern.

Final Answer: Jerk nystagmus, vestibular or central cause $\Rightarrow$ C

Answer: (C) Go Back to Q11

Q12.

Solution

Concept – orbital tumours and proptosis: Proptosis (forward displacement of the globe) has many causes; the pattern helps localise the lesion.

Step 1 – read the clues: A slowly progressive **axial** proptosis in an adult, from a well-defined intraconal mass, is characteristic.

Step 2 – name the tumour: The commonest benign primary orbital tumour in adults is the **cavernous haemangioma**, a slow-growing encapsulated vascular lesion.

Why the other options are wrong:

- A, rhabdomyosarcoma: is the commonest primary orbital *malignancy of childhood* with rapidly progressive proptosis, not the adult benign tumour.
- C, retinoblastoma: is an intraocular childhood malignancy, not an orbital mass causing adult proptosis.
- D, optic nerve glioma: occurs mainly in children and is linked with neurofibromatosis, not the commonest adult orbital tumour.

Final Answer: Cavernous haemangioma $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q12

Q13.

Solution

Concept – eyelid malignancy: The eyelid skin can develop several tumours, but one dominates in frequency.

Step 1 – read the clues: A slow-growing nodule on the **lower lid** with a **pearly rolled edge** and central ulceration is the classic appearance.

Step 2 – name the tumour: This is **basal cell carcinoma**, the commonest eyelid malignancy, most often on the lower lid and medial canthus.

Step 3 – behaviour: It is locally invasive but rarely metastasises; complete excision is curative.

Why the other options are wrong:

- A, sebaceous gland carcinoma: is uncommon, can masquerade as a chalazion, and is far rarer than basal cell carcinoma.
- B, squamous cell carcinoma: is less common than basal cell carcinoma and

lacks the pearly rolled edge.
- C, malignant melanoma: is a pigmented, aggressive tumour and is rare on the lid.

Final Answer: Basal cell carcinoma ⇒ D

Answer: (D) Go Back to Q13

Q14.

Solution

Concept – congenital nasolacrimal obstruction: Fluid trapped in the lacrimal sac at birth produces a distinctive medial-canthal swelling.

Step 1 – read the clues: A **bluish, tense cystic swelling** just below the medial canthus, present from birth, results from blockage at *both* ends of the nasolacrimal system so that secretions distend the sac.

Step 2 – name it: This is a **congenital dacryocystocele** (amniotocele), an amniotic-fluid- or mucus-filled distension of the lacrimal sac.

Step 3 – why it matters: It can become infected (dacryocystitis) and may need probing or drainage if it does not resolve.

Why the other options are wrong:

- A, chalazion: is a painless meibomian cyst on the eyelid, not a medial-canthal sac swelling.
- B, capillary haemangioma: is a bright-red proliferating vascular lesion, not a bluish tense lacrimal cyst.
- D, preseptal cellulitis: is a diffuse red, tender lid infection, not a discrete congenital cyst.

Final Answer: Congenital dacryocystocele ⇒ C

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – retinal detachment and the macula: The urgency of retinal detachment surgery depends on whether the macula is still attached.

Step 1 – read the status: The detachment is **macula-on**: central vision is still supported because the fovea remains attached.

Step 2 – decide the timing: Because the macula can detach at any time and central vision is then often not fully recovered, a macula-on detachment should be repaired **urgently**, before the macula comes off.

Step 3 – contrast with macula-off: Once the macula has already detached, the immediate rush is less, but early repair is still worthwhile.

Why the other options are wrong:

- A, elective over weeks: risks the macula detaching in the interval and losing central vision.
- B, wait for macula to detach: deliberately allows avoidable central vision loss.
- D, spectacles alone: retinal detachment is a surgical problem and cannot be corrected with glasses.

Final Answer: Urgent repair before the macula detaches $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q15

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	A	3	B	4	C	5	B
6	D	7	D	8	A	9	B	10	A
11	C	12	B	13	D	14	C	15	C