Pretectal nucleus - Fibres from pretectal nucleus project to Edinger Westphal Nucleus on both sides - Parasymathetic fibres reach ciliary ganglion - Short ciliary nerve supplying sphincter pupillae on both sides - Both pupils constrict.

Accommodation reflex - Subject is asked to focus on distant wall straight ahead and is asked suddenly to shift his focus to finger placed close to subject or on his nose. This will lead to adduction and pupillary constriction.

Accommodation reflex pathway : Optic nerve - Optic chiasma - Optic tract - Lateral geniculate body - Optic radiation - Visual cortex in occipital lobe - From visual cortex some fibres project to somatic 3rd nerve nuclei through frontal eye field producing convergence while some fibres project to Edinger Westphal nuclei constricting both the pupils through short ciliary nerves.

Argyll Robertson Pupil - Accomodation reflex present + Pupillary light reflex absent.

Facial nerve

Nucleus is located in pons from where fibres arise - Fibres loop around Abducens nucleus - Emerge through Pontomedullary junction - Enters Internal acoustic meats - Enters Facial canal in temporal bone - Exits through Stylomastoid foramen to traverse through parotid gland to finally give five terminal branches.

Functions :

A) Sensory - Carries taste sensation from anterior 2/3rd of tongue.

For sensory examination ask subject to protrude anterior 2/3rd of tongue, remove saliva with help of clean cotton - now with eyes closed, drop solutions of sugar and salt - ask subject to identify taste sensation.

B) Secretory - Carries secretomotor fibres to submandibular, sublingual and lacrimal glands. To test secretory function place flavoured substance upon tongue - Ask subject to elevate tongue - Flowing saliva can be seen.

Schirmer test - Pieces of special blotting paper is placed under lower eyelids - Blotting papers are kept for 5min tests - Normally at least 10mm of blotting paper will be dampened by tears. It is a test to assess lacrimation.

C) Motor- Muscles of facial expression, posterior belly of diagastric, stylohyoid and stapedius.

Ask subject to raise eyebrows, wrinkle forehead, close eyes as tightly as possible and resist opening of eyes, show teeth and look for symmetry, to whistle and blowout cheeks.

D) Reflexes: a) Corneal reflex already discussed in trigeminal nerve. b) Stapedial reflex - Stapes is stimulated by loud noise - Reflex contraction of stapedius leads to reduction in transmission of sound.

Chorda tympani branch supplies parasympathetic fibres to submandibular

and sublingual glands and carries taste sensation from anterior 2/3rd of tongue.

Five terminal branches are - Temporal, zygomatic, buccal, mandibular and cervical.

		Unilateral UMN Facial palsy	Unilateral LMN Facial palsy
1.	Loss of frontal wrinkles	–	+
2.	Bell's phenomenon	–	+
3.	Loss of nasolabial fold	+	+
4.	Deviation of mouth to opposite side	+	+

Upper face escapes UMN palsy because of its bilateral presentation in cortex.

		Bilateral UMN Facial palsy	Bilateral LMN Facial palsy
1.	Bell's phenomenon	Absent	Present
2.	Corneal reflex	Present	Absent

whispers some number in one ear with other ear closed and ask to identify the number. Normally a person will identify the whisper.

2. Rinnie test : After striking a 512 Hz tuning fork on any bony prominence, place fork on mastoid process, when subject stops hearing then place fork's parallel blades near external ear canal. Normally subject will continue to hear as air conduction is better than bone conduction. This is called Rinnie positive test. Rinnie positive is seen in normal individuals as well as in sensorineural deafness cases. Rinnie negative (bone conduction better than air conduction) is seen in conductive deafness.

3. Weber rest : Vibrating tuning fork is placed on vertex of the head or in midline equidistant from both ears, subject is asked whether he can hear equally or not in both ears. If heard equally, it is normal. If sound is better heard in normal ear (lateralisation to normal ear) indicates sensorineural deafness while if sound is better heard in abnormal ear (lateralisation to affected side) indicates conductive deafness.

Glossopharyngeal and Vagus Nerves

Both nerves are usually considered together. Nuclei lies in medulla oblongata - Fibres from these nuclei pass through jugular foramen between internal carotid artery and internal jugular vein to leave skull to supply different structures.

Glossopharyngeal nerve - Motor supply to stylopharyngeus. Parasympathetic supply to parotid gland. Sensations (both general and taste sensation) are carried from posterior 1/3rd of tongue and pharynx.

Vagus nerve - It is longest cranial nerve. Motor supply to all muscles of pharynx (except stylopharyngeus) and larynx. Parasympathetic supply to heart, gastrointestinal tract and bronchial tree. Sensory supply to part of auditory meatus.