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Paper :- Regional & Radiological
Anatomy

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Q:-1 STRUCTURE OF EAR:-

⇒ It is organ of hearing & balance.

It has three parts

- ① First part or External ear:-
- ② Second part is the middle ear
- ③ Third part is the internal ear.

External Ear:-

It is the part attached to lateral aspect of head and the canal leading inward.

It consist of two parts

- ① Auricle (pinna)
- ② External acoustic meatus

① Auricle:- The auricle is on the side of the head & assist in capturing sound. It consist of cartilage covered by skin & arranged in a pattern of various elevation & depression.

- It consist of:-
- ① Helix
 - ② Concha of auricle
 - ③ Tragus
 - ④ Lobules
 - ⑤ Antihelix

* External acoustic Meatus: (3)

It extends from the deepest part of the concha to the tympanic membrane "eardrum" a distance about 1 inch (2.5 cm)

It consists of cartilage & bone.

The lateral one third is formed from cartilaginous & medial two thirds is formed by temporal bone.

It consists of sweat glands producing cerumen ("earwax")

Sensory Innervation:

Sensory innervation of Auricle & External Acoustic Meatus of many sources like great auricular Nerve, lesser occipital Nerve, cervical plexus and branch of mandibular Nerve, auriculotemporal Nerve & branch of vagus Nerve.

Tympanic Membrane:

It separates the external acoustic Meatus from middle ear. At periphery it is attached to temporal bone while at center it is an cavity in shape by attachment of the handle of malleus. The point of attachment is the "Umbo of tympanic membrane"

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Innervation:- It is innervated by different cranial Nerve.

Middle ear:-

It is ear filled, mucosa membrane lined space in the temporal bone b/w tympanic membrane laterally & lateral wall of internal ear medially.

It consist of two parts:-

(1) tympanic cavity

(2) epitympanic recess. superiorly.

The middle ear communicates with the mastoid area anteriorly & posteriorly & nasopharynx.

Function:-

The middle ear communicates with the mastoid area posteriorly & nasopharynx. It basic function is to transmit vibration of tympanic membrane across the cavity of the middle of middle ear to internal ear.

Boundaries:-

It has a roof & floor, anterior, posterior, medial, & lateral wall.

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① Tegmental wall:-

It is the roof of middle ear consist of thin layer of bone which separate the middle ear from cranial fossa.

② Jugular wall:-

It is the floor of middle ear consist of thin layer of bone that separates it from the internal jugular vein. occasionally the floor is thickened by the presence of mastoid air cells.

③ Membranous wall:-

The membranous "lateral wall" of the middle ear consist almost entirely of tympanic membrane.

④ Mastoid wall:-

The mastoid "posterior" wall of the middle ear is only partially complete. The lower part of this wall consist of a bony partition b/w the tympanic cavity & mastoid air cells.

⑤ Anterior wall:-

The anterior wall of the middle ear is only partially complete. The lower part consist of a thin layer of bone.

⑥ Membranous wall:- The lateral wall of the middle ear consist almost entirely of tympanic membrane.

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⑧ Pharyngotympanic tube:-

It connects middle ear with the nasopharynx & equalize pressure on both side of the tympanic membrane.

Auditory Ossicles:-

The bone of middle ear consist of malleus, incus, & stapes. It is present across the middle from tympanic membrane to oval window of internal ear.

Muscles of middle EAR:-

It consist of two muscle

- ① Tensor tympani
- ② Stapedius

Vessels:-

Numerous arteries supply middle ear.
two largest branches ① Maxillary artery

- ② Mastoid branch of the occipital or posterior auricular artery.

Innervation The tympanic plexus innervates the middle ear lining the wall & contents of the middle ear. It is formed by the tympanic nerve. a branch of the glossopharyngeal nerve. & from the branch of the

⑦ Internal EAR:-

The internal ear consist of a series of bony cavity "the bony labyrinth" & membranous duct within these cavity "the membranous labyrinth".

- The bony labyrinth consist of
- ① Vestibule
 - ② Semicircular canals
 - ③ Cochlea

These bony cavities are lined with periosteum and contain a clear fluid "the perilymph".

suspended with the perilymph but not filling all spaces of the bony labyrinth is the membranous labyrinth which consist of the "Semicircular duct" the "cochlear duct" and two sacs "the utricle and saccule".

These membranous spaces are filled with endolymph.

Cochlear duct - It is the organ of hearing

Semicircular ducts, utricle & saccule
It is the organ of balance.
Vestibulocochlear nerve carries special afferent for hearing & balance.

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Q:-2 ① Sub Mandibular glands:-

It is a salivary gland which is smaller than the parotid gland & larger than sublingual glands.

Each has a hook shaped.

1) The larger arm of the hook is directed forward in the horizontal plane below the mylohyoid muscle

2) The smaller arm of the hook of the gland loop around the posterior margin of mylohyoid muscle.

② Submandibular Ducts:-

It emerges from the medial side of the deep part of the gland in the oral cavity & passes forward to open on the summit of the small sublingual caruncle beside the base of the frenulum of the tongue.
It drain into oral cavity.

③ Sublingual glands:-

The sublingual glands are the smallest of the three major paired salivary glands.

Each is almond shaped and is immediately lateral to the submandibular duct & associated lingual nerve in the floor of the oral cavity.
Each sublingual gland lies directly against

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against the medial surface of the mandible where it forms a shallow groove "Sublingual fossa" superior to the 1/3rd of the mylohyoid bone.

The superior margin of the sublingual gland raises an elongate fold of mucosa "Sublingual fold" which extend from the posterolateral aspect of the floor of the oral cavity to the sublingual papillae.

It drain into the oral cavity via numerous small ducts "Minor sublingual ducts" which open onto the crest of the sublingual fold.

Q:3 **Submandibular Stone formations** -

80% Stone are possibly in submandibular gland Stone known as "Sialolith"

Causes: - The reason is that Stone formation is more common in submandibular gland than other gland is: -

(1) The concentration of calcium in saliva produced by submandibular glands is twice that of the

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Q:4 vertebrae of Human Skeletal system:-

There are ~~30~~ - 32-33 vertebrae.

Each vertebra is an irregular bone with a complex structure composed of bone & some hyaline cartilage. The proportions of which vary according to the segment of the back 'backbone' and the species of vertebrate.

Consist:- It consist of

- ① large part is the body
- ② central part is the sternus
- ③ The upper & lower part surfaces of the vertebra body give attachment to intervertebral disc.
- ④ The posterior surface of the vertebra forms a vertebral arch, consisting of two pedicles, two laminae & seven process.
- ⑤ Consisting, the laminae give attachment to the ligamenta flava 'ligaments of the spine'

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These are vertebral notches formed from the shape of the pedicles which form the intervertebral foramina when the vertebrae articulate.

The foramina are the entry & exit conduct for the spinal nerves.

The body of the vertebrae of vertebral arch form the vertebral arch from the vertebral foramen the larger central opening that accommodate spinal canal which enclose & protect the spinal cord.

Functions.

vertebrae articulate with each other to give strength and flexibility to the spinal column & the shape at their back & front aspects determine the range of movement.

Structure: In human vertebral column the size of vertebrae is different according to location of vertebral column. Each vertebrae is an irregular bone.

Every vertebra has a

- ① Body which consist centrum
- ② vertebral Arch
- ③ Neural Arch

The upper & lower surface of the body of the vertebra are flattened & rough and in order to give attached to the intervertebral disc

There are seven process projected from the vertebra.

- ① spinous process
- ② Articular process
- ③ Transverse process
- ④ Costiform process

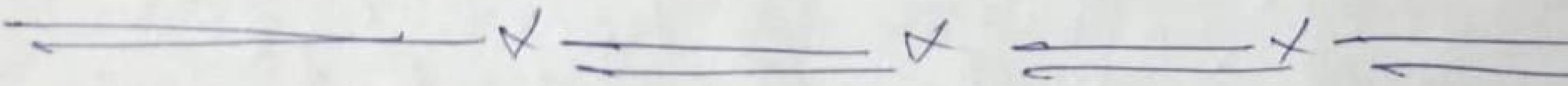
Regional variations-

vertebra take their name from region of vertebral column that they occupied

- ① Cervical vertebra :
It is seven in number
- ② thoracic vertebrae :
It is twelve in number
- ③ Lumbar vertebrae :
It is five in number

④ ~~10~~ ¹⁴ Sacral vertebrae
It is five in number

⑤ ^{Coccyg} ~~Sacral~~ vertebrae
It is ^{three to} five in number.



Q (10) (5) %

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IMPORTANCE of
Radiology in medical field:

Ans: ☆ ~~~~~ ☆

Radiology is all about imaging for medical purpose.

⇒ It includes radiographers, radiologists, Sonographers, nurses, bio medical engineers, nurses, medical physicists and other support staff.

⇒ There is a lot of importance of radiology in medical field. Some of which are given below.

⇒ X ray use radiation to look through the body and see foreign objects and bones.

⇒ This allows physicians to better diagnose anything wrong with the bone structure or their disease which leads to the proper course of treatment.

Other Imaging:

Along with the x-ray radiology has grown to include other imaging technology such as CT, MRI, Fluoroscopy and Angiography.

⇒ These different technologies allow for real-time imaging of the digestive system, looking at the blood vessels, providing 2D and 3D maps of OD.

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⇒ Radiology is the key diagnostic tool for many disease and has important role in monitoring treatment and predicting outcome.

⇒ it has a number of imaging modalities which play a crucial role in medical care.

X Ray is

Radiology started with the x ray which changed the field of medicine forever.

⇒ The ability to use imaging to see inside the body.

⇒ Diagnose a broken bone, diagnose disease and so much more has made radiology necessary for medical field.

Tissue within the body
and providing cross-section
views of the body.

⇒ With out these technologies
it with out world very
different for physicians to
diagnose many of the
common disease Today.

Doctors Rely on Radio-
graphers.

In today's
medical field, Doctors rely
heavily on radiographers.
They need accurate tests
to be able to diagnose
the issue and provide
the proper treatment.

Central to Disease MANAGEMENT:0

So many horrific
diseases has Important
to have a good
diseases management plan.

⇒ Radiology plays a
huge role in disease
management by giving
physicians more options,
tools, and techniques
for detection and
treatment.

Diagnostic Images:

⇒ Diagnostic imaging allows
for detailed information
about structure or
diseases - related changes.

⇒ it has the ability to
diagnose during early
stages, patients may be
saved.

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⇒ With out radiology the
may be not be
possible.

⇒ When it all comes
down to it.