Spinall cord

→ spinall cord is a long cylindrical and lower part of CNS.

→ It occupies the upper 2/3 rd of vertebrall column.

→ It gives Rise to 31 pair of spinall Nerve

→ extend to C1 to L1 or L2 vertebra.

→ Sper. superiorly it is continous with Medulla oblongata and Inferior to conus medullaris.

→ Length :- 45 cm

→ weight :- 30 gm.

→ Position :- Spinall cord is much shorter then the length of vertebrall column.

Spinall segment	Vertebrall level
C1 - C3	C1 - C3
C4 - C8	C4 - C7
T1 - T6	T1 - T4
T7 - T12	T5 - T9
L1 - L5	T10 - T11
S1 - S5 & Co1	T12 - L1

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✱ Meningeal Covering

→ Dural Mater ⟶ outer
Arachnoid Mater ⟶ Intermediate
Pia Mater ⟶ Inner

→ Below the level of conus Medullaris only Pia Matter is continuous as a thin Fibrous cord called Filum Terminal

↓

20 cm long and In B/w to conus medullaris and 1st coccyx vertebra.

→ The dural Matter and arachnoid matter with the subarachnoid space containing CSF extend upto 2nd Sacral vertebra

→ B/w the lower Border of L1 & S2 the Subarachnoid Space contains Spinal Nerve Roots and CSF which constitute the Cauda Equina (Horse tail)

↙

Bundle of Nerves Roots.

→ Dorsal & Ventral Roots of Right & left side of
- 12 - L5
- S1 - S5
- Co1

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* External Feature

i) Ant. Relation - Antero- Midian Fissure
Place lodging the ant. spinal Artery
रहना (ठहरना)

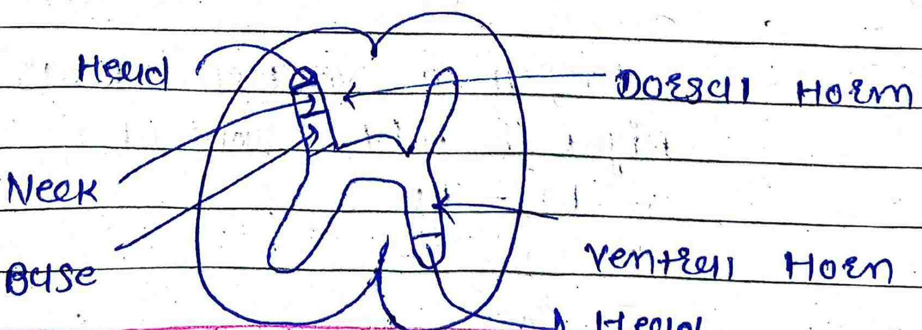
ii) Post. Relation - Median sulcus is a thin longitudinal groove from which a septum runs in the depth of spinal cord.

* Internal → Ventral or. Motor Nerve Root emerge from antero - lateral sulcus.
→ Dorsal or. Sensory Nerve Root enter the postero - lateral sulcus.

* Internal Structure

→ Gray Matter of S.C.

- It is H shape
- Ventral column divided into ventral part Head and Dorsal part - Base
- Neck &
- Head



Ant. Horn
↳ Lateral → ventral → Midial

Post. Horn

Lateral Horn

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Ant. Horn → Motor
Post. Horn → Sensory function
Lateral → Visceral efferent & afferent function

- Nuclei of Spinal grey Matter

– Neurons of ventral grey column arranged in form of elongated groups.

Ant. Horn
↳ Lateral

i) Medial group → Dorso medial
→ Ventro medial

ii) Lateral group → Dorso lateral
→ Ventro lateral
→ Retro dorso-ventral

Ventral iii) Central group → Phrenic & Accessory Nuclei lumbosacral Nucl

Medial iv) Spinal group → large cells along the ant. margin of the ventral grey column.

Post. Horn v) Dorsal grey column → substantia gelatinosa
areas Recognised as → Nucleus Proprius
→ Dorsal Nucleus.

Lateral Horn vi) Blw ventral & Dorsal grey column → Intermediolateral Nucleus & Intermedio Medial Nucleus.

→ Neural connection of grey Matter of Spinal cord divided into 10 areas / lamine as lamine I to X

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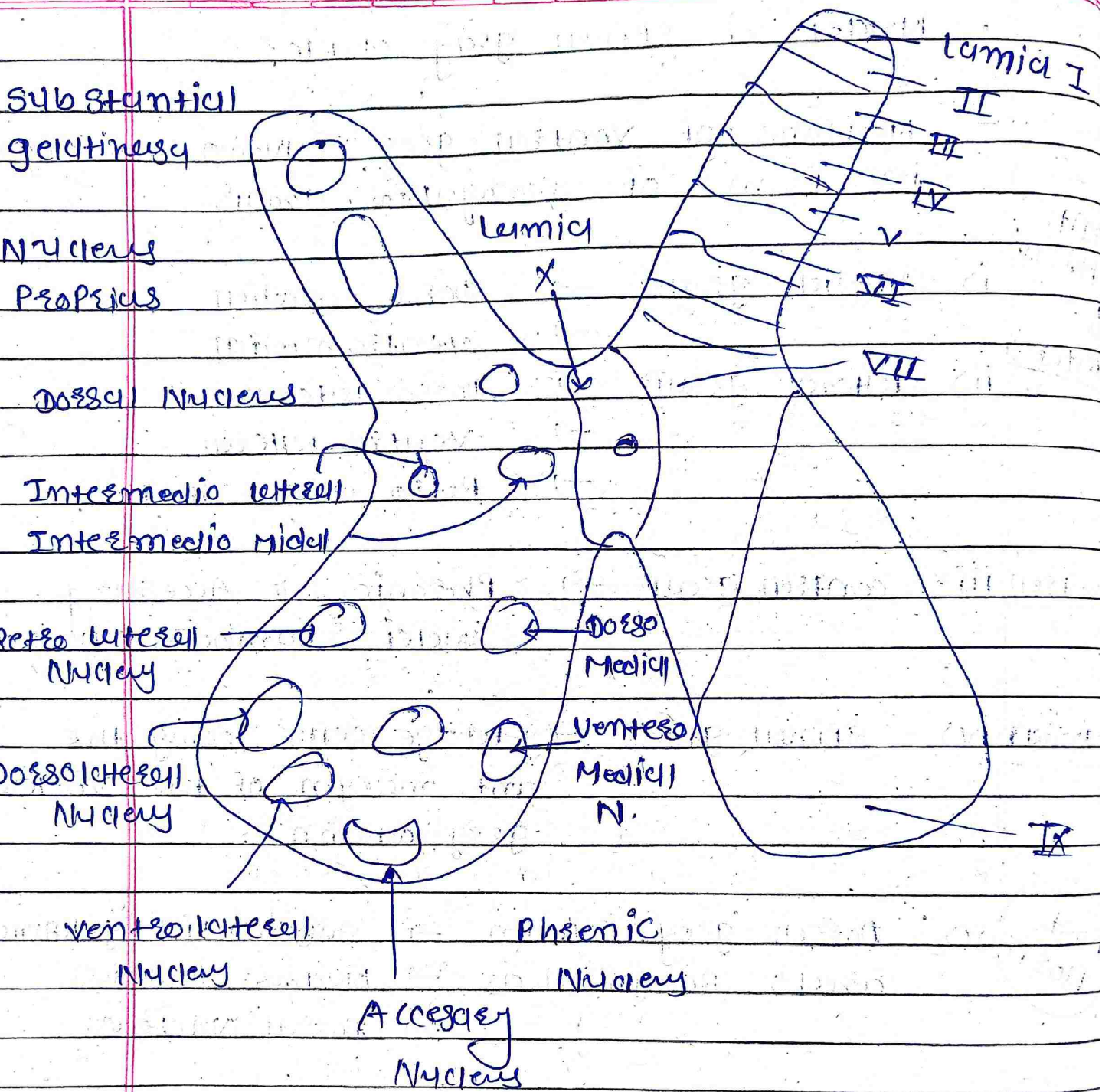

→ white matter

- forms nerves fibrous, connective tissue Blood vessels
- 2 lateral Halves
  1) Dorsal white commissure
  2) Ventral white commissure

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- Collection of Nerve Fibers → Runs to longitudinal
  1) Dorsal
  2) Lateral
  3) Ventral Funiculi

*) Classification of Tract –

→ White matter made up on tracts
→ 2 tract –

1) ascending (sensory tract)
- carrying sensation from Body Receptors to CNS.
- i) lateral Spino thalamic
  ii) anterior spino thalamic
  iii) Fasciculus gracilis
  iv) Fasciculus cuneatus
  v) Dorsal Spino cerebellar
  vi) Ventral Spino cerebellar

2) Descending (Motor)
- carry Impulse : to Brain to Body Parts

1) Pyramidal (cortico - spinal)
  i) anterior
  ii) Posterior

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2) Extra pyramidal
   i) Rubro Rubro Spinal (Red Nuclei)
   ii) tecto Spinal (Mid Brain)
   iii) Vestibulo Spinal (Pons Region)
   iv) Olivo Spinal
   v) Reticulo Spinal.

→ Blood Supply :- Ant. & Post. Spinal artery.

→ Clinical Anatomy

- Cauda equia Syndrome → lower motor neuron Paralysis in lower limb

- Lumber Puncture → needle can be Introduced into Subarachnoid Space to withdraw a Sample of CSF.
  B/w L3 - L4 and
  L4 - L5

- Spinal anesthesia given to Lumber puncture.

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(*) Spinal Nerve (मेरुदण्डीय तंत्रिकाएं)

→ 31 pairs of spinal nerves.
→ Dorsal & ventral spinal roots join together to form spinal nerve.
→ comes out through Intervertebral foramina

C - 8
T - 12
L - 5
S - 5
Co - 1

→ C1 out BTW Occipital bone and Atlas
→ C8 Passes BTW C7 and T1 vertebra

(*) Components of spinal Nerves.

Somatic component

S. efferent → Supply to Skeletal M.

S. afferent → carry Impulse to CNS from Skin, Tissue Joints etc.

Visceral component

V. efferent → Dorsal Ramii
- Supply the
- Muscles, Skin,
- Post. Region of Neck
- and Trunk through

V. afferent

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→ Dorsal Rami

↓

Supply to -

- Muscle
- Skin
- Post. Region of Neck and Trunk through C, T, L, S, Co

↓

Formed Plexes

→ Ventral Rami

↓

Supply to -

- limbs
- Anterolateral aspect of Trunk

(C, T, L, S, Co)

Not found

↓

Don't formed Plexes

→ Plexus :- Network of axons.

1) Cervical Plexus
2) Brachial Plexus
3) Lumbar Plexus
4) Sacral Plexus
5) Coccygeal Plexus

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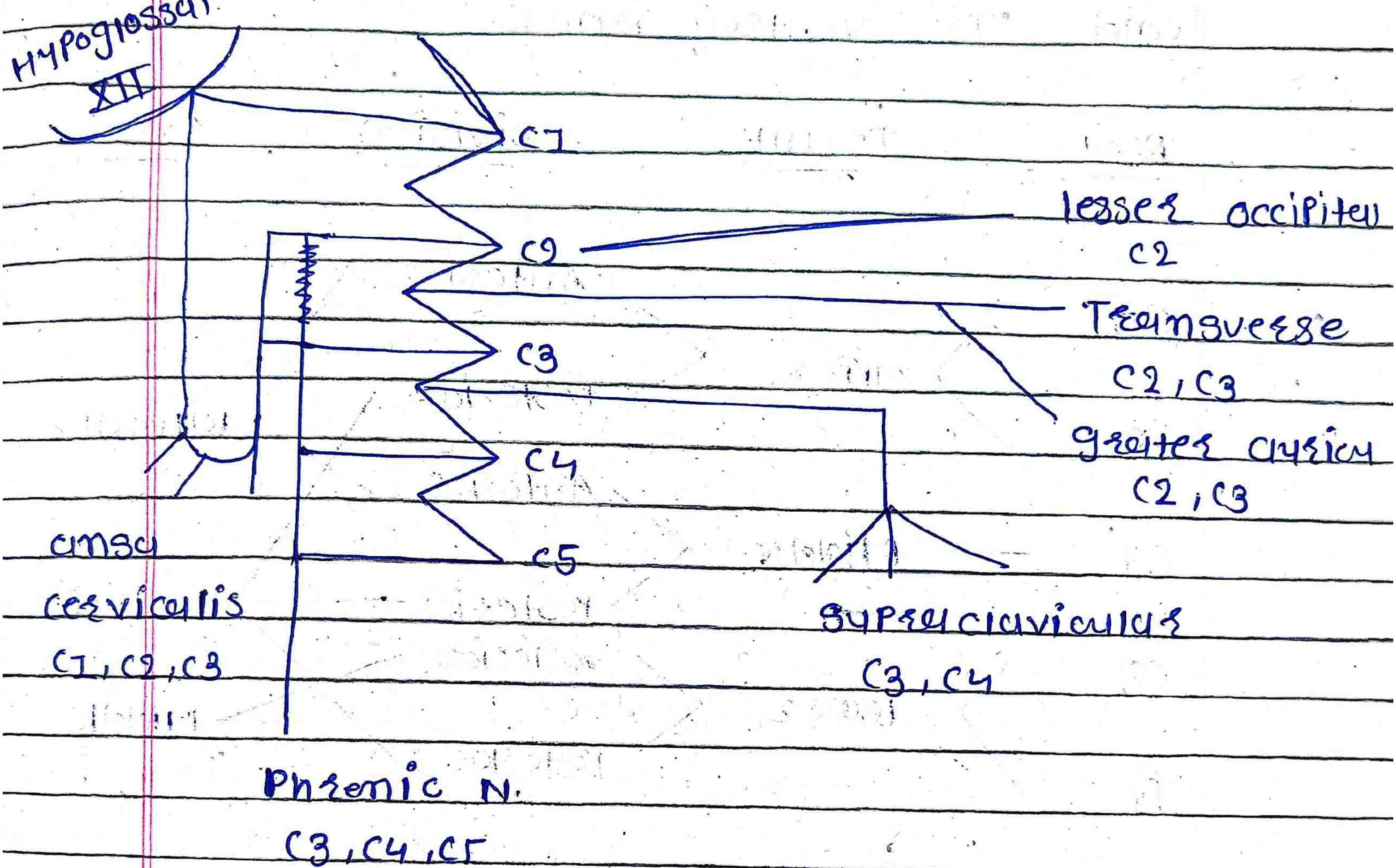
1) Cervical Plexus (ग्रीवानुगा तंत्रिका प्रचेणी)

→ Formed upper 4 cervical ventral rami



Asce. Superficial N.
1) lesser occipital (C2) → Skin of scalp
2) greater auricular (C2 - 3) → Ear, Mastoid Process
3) Trans cutaneous N. of Neck (C2 - 3) → Ant - lat. Skin of neck

Desc. Superficial N.
4) supraclavicular (C3 - 4) → Shoulder

Desc. Medium Series
5) ansa cervicalis (C2 - C3) → Sternohyoid M.
6) Phrenic N. (C3 - C5) → Diaphragm

Descen lateral
7) Muscular (C1 - C4) → Trapezius, levator Scapular

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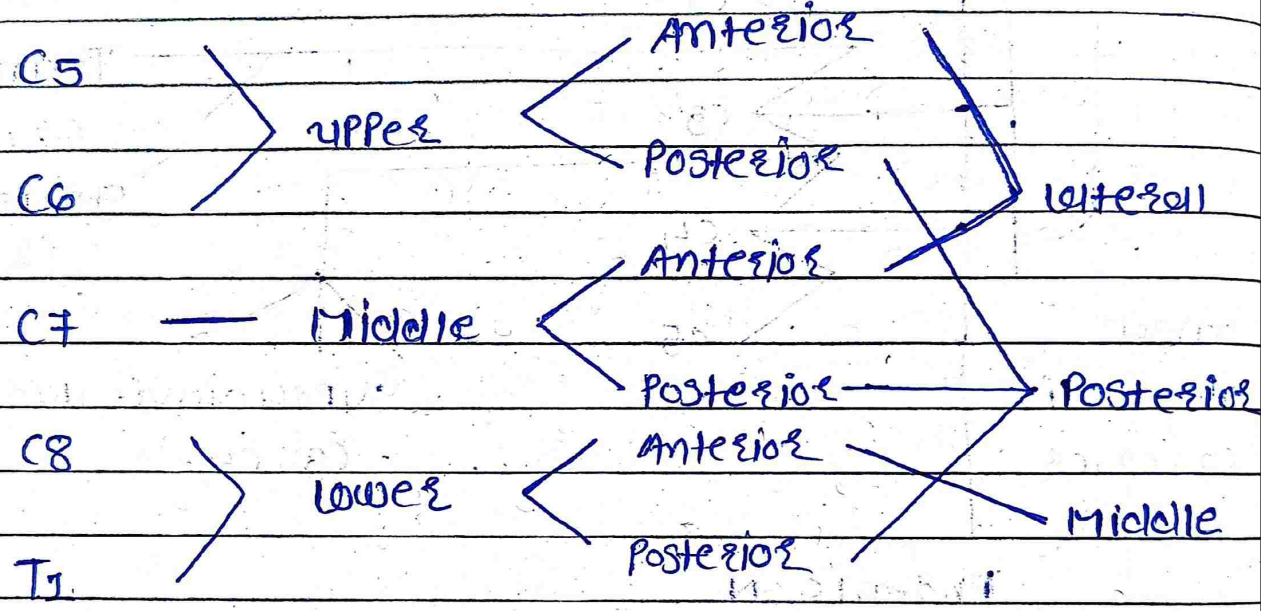
2) Brachial Plexus (ब्राकियल प्लेक्सस)

→ Formed By C5 to C8 Ventral Rami and T1 Ventral Ramus.



Division

1) Lateral cord Divi (LMP)
   i) Lateral Pectoral N. → Pectoralis Major & Minor
   ii) Musculo Subcutaneous N. → Brachialis, Biceps
   iii) Lateral Root of Median N. →

2) Medial cord div. (M4U)

i) Medial Root of Median N. ⟶
ii) Musculo cutaneous N. ⟶ Skin of Medial and of arm
iii) Musculo cutaneous N. ⟶ Skin of Medial and of forearm
iv) Medial Pectoral N. ⟶ Pectoralis major & Minor
v) Ulnar N. ⟶ Flexor carpi ulnaris etc.

3) Posterior cord Division (STARS)

i) Upper Subscapular N. ⟶ Superscapularis
ii) lower Subscapular N. ⟶ Teres major & Superscapularis
iii) Thoracodorsal N. ⟶ Latissimus dorsi
iv) Axillary N. ⟶ Deltoid, shoulder joint
v) Radial N. ⟶ Triceps Brachi, arm & forearm Muscle

⟶ Total 17 Nerves arise in Brachial Plexus 13 in this Flow wise and 4 to different

• 2 Direct arise in Root
i) Dorsal Scapular N.
ii) long Thoracic N.

2 Direct arise in Trunk
i) Suprascapular N.
ii) Nerve to Subcl...

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→ Clinical Significance

1) Erb's Point → 6 nerves are Meet to this Point
→ 2-3 cm above the clavicel.

2) Erb's Palsy → Injury to Upper Trunk

3) Ulnar N. is called musician's Nerve

4) Median Nerve control the movement of Hand called Laborers Nerve.

→ Dicy-

L1

L1

L1, L

L2, L3

L2, L3, L

L2, L3, L

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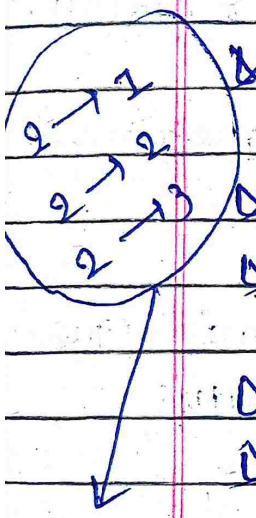
3) Lumbar Plexus (कटि तंत्रिका जालिका)

→ Formed by 1st 3 lumbar ventral rami and most of 4th.

→ L1 to L5



L1	→	I^2 — Ilio Hypogastric N. — Ilio Inguinal N.
L1, L2	→	G — genito-femoral N. L — lateral femoral cutaneous N.
L3, L4	→	O — Obturator N. F — Femoral N.

L1 i) Ilio-Hypogastric N. → Muscle of ant. abdominal wall.

L1 ii) Ilio-Inguinal N. → Root of Penis & Scrotum and mons pubis

L1, L2 iii) genito-femoral N. → thigh surface and Male-femal genital organ

L2, L3 iv) lateral femoral cutaneous → gluteal skin

L2, L3, L4 v) Obturator N. → Hip & knee joint

L2, L3, L4 vi) Femoral N. → Biceps femoris, thigh Region Muscle

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4) Sacral Plexus (त्रिक तन्त्रिका जालिका)

→ formed to
L4 to S4

L4 - L5 - & S1 i) Superior gluteal N. → gluteus Muscle (minimus & medius)

L5 - S1 - S2 ii) Inferior gluteal N. → gluteus maximus

S1 - S2 iii) Nerve of piriformis → piriformis Muscle

L4 - L5 - S2 iv) Nerve of quadratus → quadratus femoris

→ Sciatic Nerve → It is generally caused by the compressions of Nerve Root of sciatic Nerve (It self compression)

Due to irritation of sciatic N. → Radiating Pain is felt along the course of Sciastic Nerve

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5) Coccygeal Plexus

→ Formed to

S4 – S5 – Coccygeal Nerve – Anococcygeal Nerve

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