SKULL BRAIN AND CRANIAL NERVES

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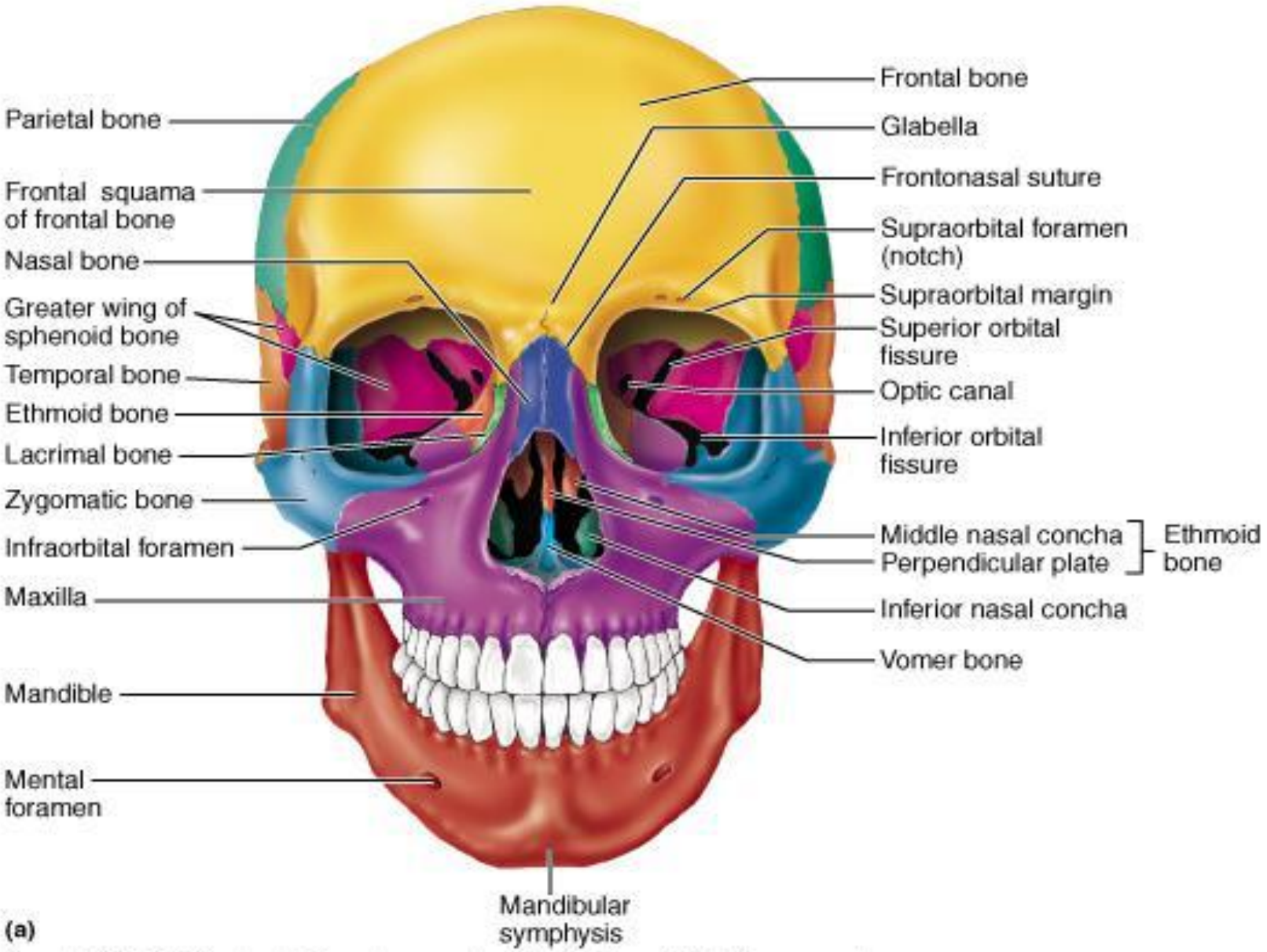
SKULL

- AXIAL SKELETON FORMS THE LONG AXIS OF THE BODY
- IT IS MADE UP OF 80 BONES, ARRANGED IN 3 REGIONS, SKULL, VETEBRAL COLUMN AND THE THORACIC CAGE
- THE AXIAL SKELETON SUPORTS THEHEAD AND NECK AND PROTECTS THE BRAIN , SPINAL CORD AND THE THORACIC ORGANS
- SKULL
- CRANIAL BONES+ FACIAL BONES
- CRANIAL BONES------CRANIUM----ENCLOSE AND PROTECT THE BRAIN AND PROVIDE ATTACHMENT TO MUSCLES
- FACIAL BONES----1) FORM FRAME OF THE FACE
- 2) FORM CAVITIES FOR SENSE ORGANS(NOSE, EYES, ORAL)
- CAVITY(TASTE
-
- 3) PROVIDE OPENINGS FOR AIR AND FOOD
- 4) PROVIDE CAVITIES TO HOLD TEETH
- 5) PROVIDE ATTACHMENT TO THE MUSCLES
-

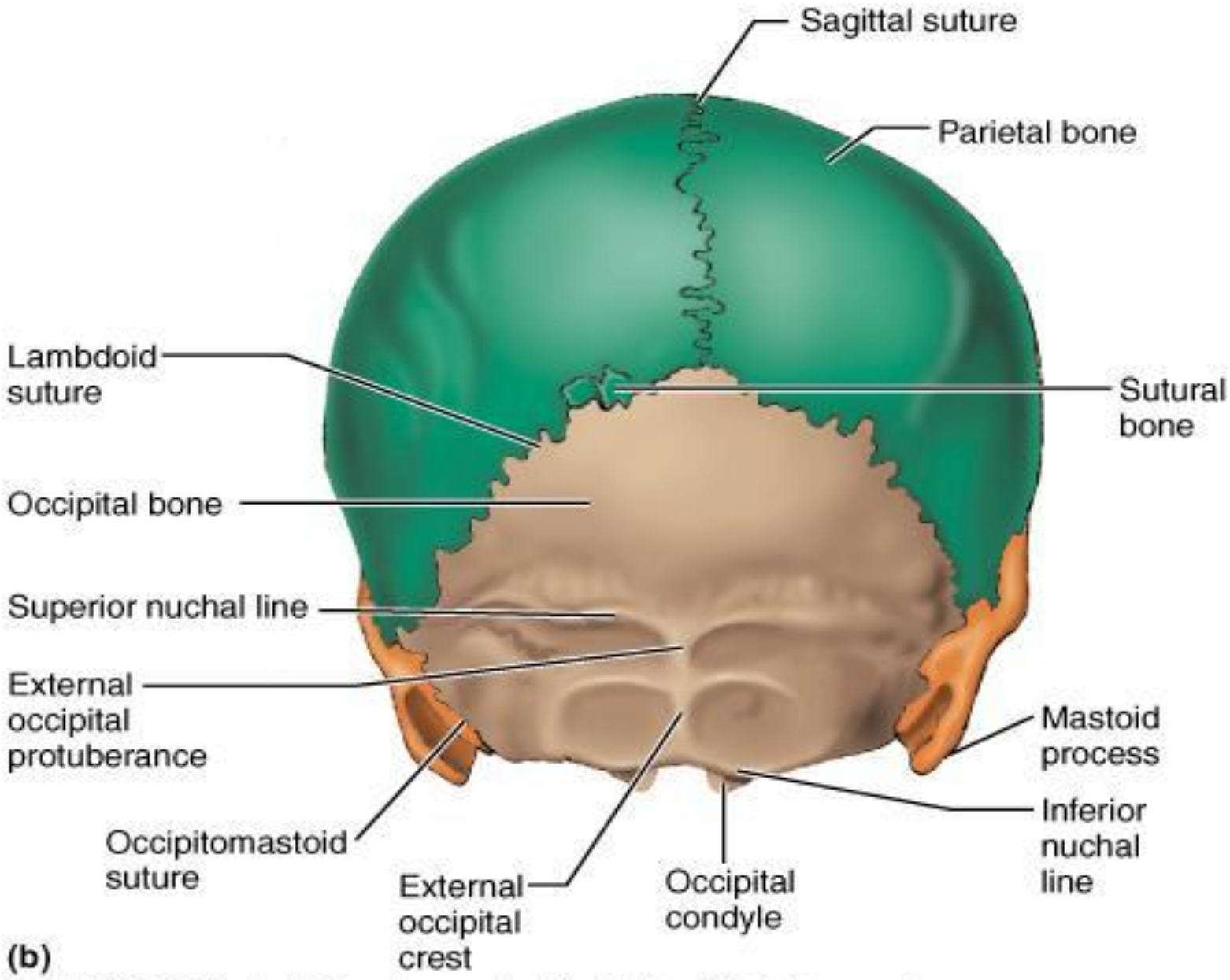


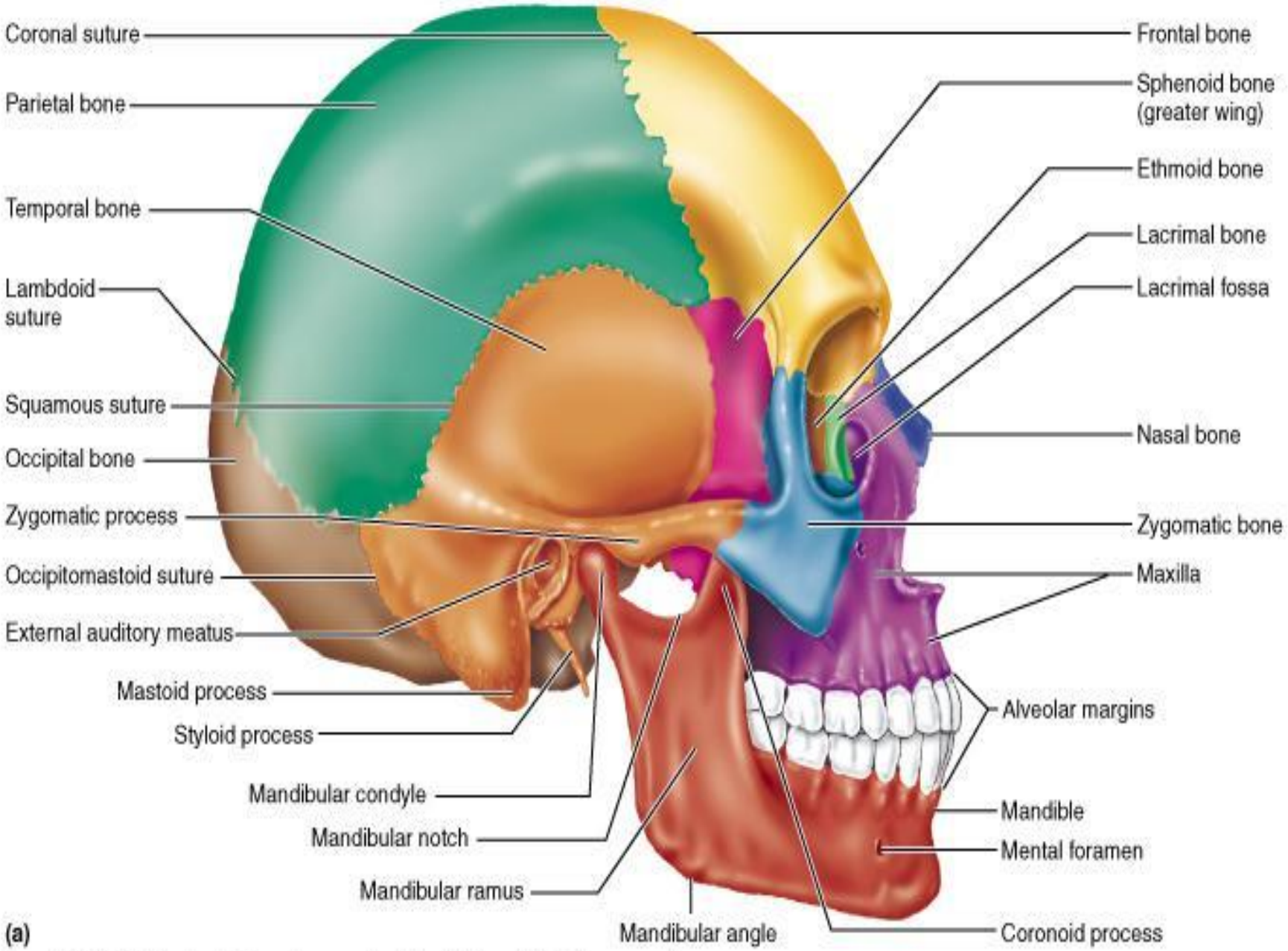
(a)

SKULL

- BONES OF THE SKULL ARE FLAT.
- THE JOINTS BETWEEN THE BONES ARE CALLED SUTURES(INTERLOCKING AND IMMOVABLE)

1) CORONAL SUTURE
2) SAGITTAL SUTURE
3) LAMDOID SUTURE
4) SQUAMOSAL SUTURE





(a)

SKULL

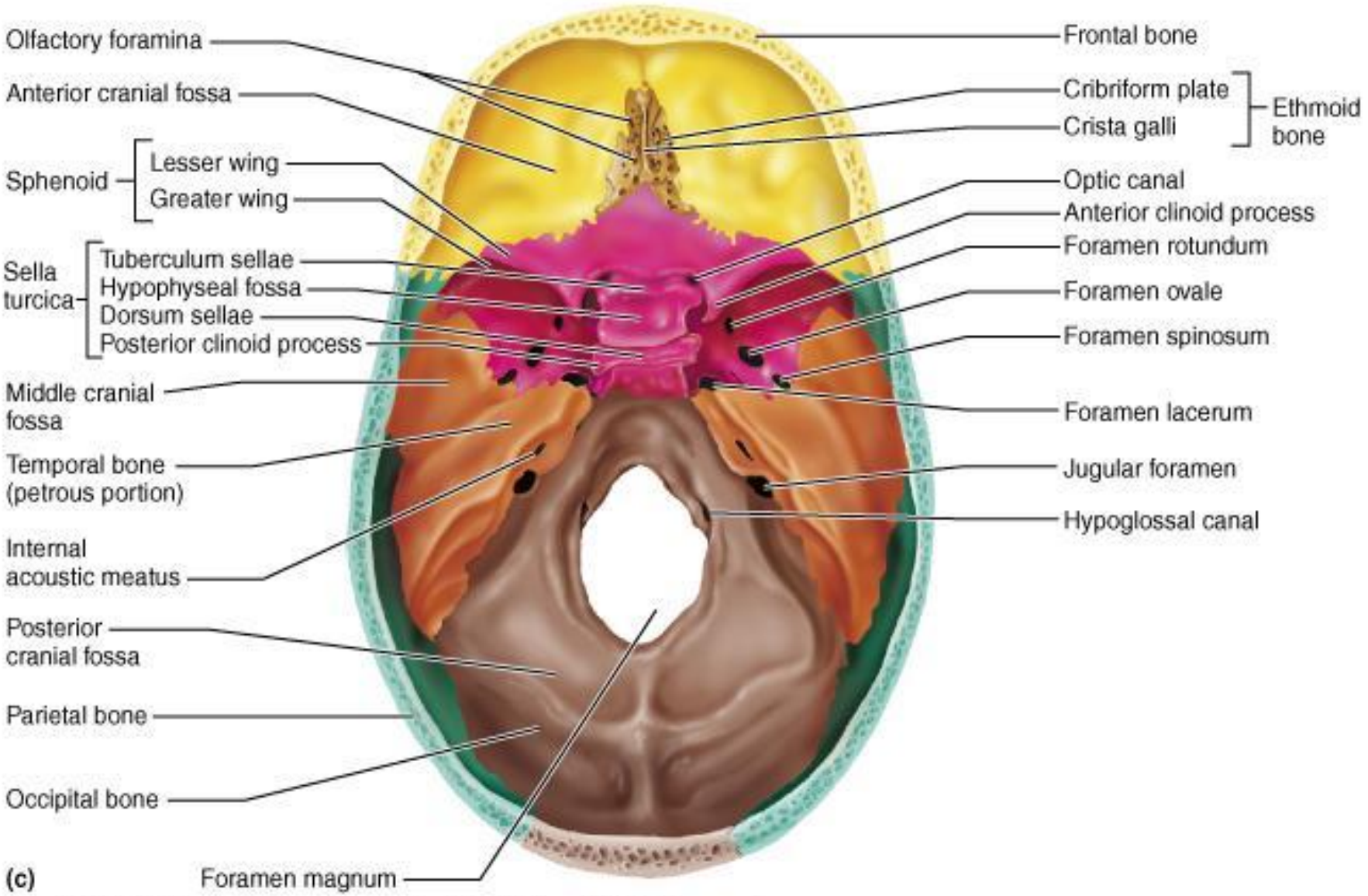
- THE CRANIAL VAULT -----CLAVARIA(SUPERIOR, LATERAL AND POSTERIOR ASPECT AS WELL AS THE FOREHEAD
- CRANIAL BASE---- FLOOR. INTERNAL ASPECT SHOWS 3 STEPS

  1) POSTERIOR CRANIAL FOSSA-- BASEMENT

  2) MIDDLE CRANIAL FOSSA--- 1ST FLOOR

  3) ANTERIOR CRANIAL FOSSA--2ND FLOOR)

* EACH FOSSA HAS A SPECIFIC LOBE OF THE BRAIN SITTING INSIDE IT



(c)

SKULL

- SMALLAR CAVITIES INSIDE THE SKULL

1) INNER EAR
2) MIDDLE EAR
3) NASAL
4) ORBITAL
5) PARANASAL SINUSES

❖ OPENINGS(FORAMINA, CANAL,FISSURES)--- 85 NAMED

THESE ALLOW THE PASSAGE OF SPINAL CORD(WHICH OPENING?) , CRANIAL NERVES (12) , BLOOD VESSELS

* FEATURES OF THE SKULL BONES FIGURES 7.2 TO 7.4 AND TABLE 7.2 PAGES 160-161

SKULL THROUGHOUT LIFE

- SKULL DEVELOPS IN MEMBRANE---- OSSIFICATION ---LATE IN THE 2ND MONTH
- OSSIFICATION BEGINS IN THE MIDDLLE AND SPREADS OUTWARDS
- AT BIRTH PARTS OF THE SKULL ARE STILL NOT FORMED(FONTANEL)
- 4 MAJOR FONTANELS ARE SEEN

1. ANTERIOR
2. POSTERIOR
3. MASTOID
4. SPHENOID

- THESE ALLOW THE BONES OF THE SKULL TO SLIP OVER EACH OTHER DURING BIRTH (MOULDING)
- THE FRONTAL BONE AND MANDIBLE START AS 2 HALFS , WHICH FUSE LATER ON

SKULL THROUGHOUT LIFE

- CHANGES IN THE FORM OF THE SKULL

1. AT BIRTH THE SKULL APPEARS LARGER THAN THE FACE
2. BY 9 MONTHS SKULL ATTAINS HALF THE SIZE OF THE ADULT SKULL
3. BY 2 YRS IT IS ¾ THE SIZE OF THE ADULT
4. 8-9 YRS ADULT SIZE
5. FACE ENLARGES BETWEEN 6-13 YRS

SKULL

- CRANIAL BONES---- TOTAL OF 8
- PAIRED---- TEMPORAL AND PARIETAL
- UNPAIRED---- FRONTAL, OCCIPITAL, SPHENOID AND THE ETHMOID

FRONTAL BONE(FEATURES)

1. FORMS FOREHEAD AND ROOF OF THE ORBITS
2. SPRAORBITAL MARGIN
3. SUPRAORBITAL NOTCH/FORAMEN
4. GLABELLA
5. FRONTONASAL SUTURE
6. FRONTAL SINUS
7. ANTERIOR CRANIAL FOSSA

SKULL

- **PARIETAL BONE (FEATURES)**

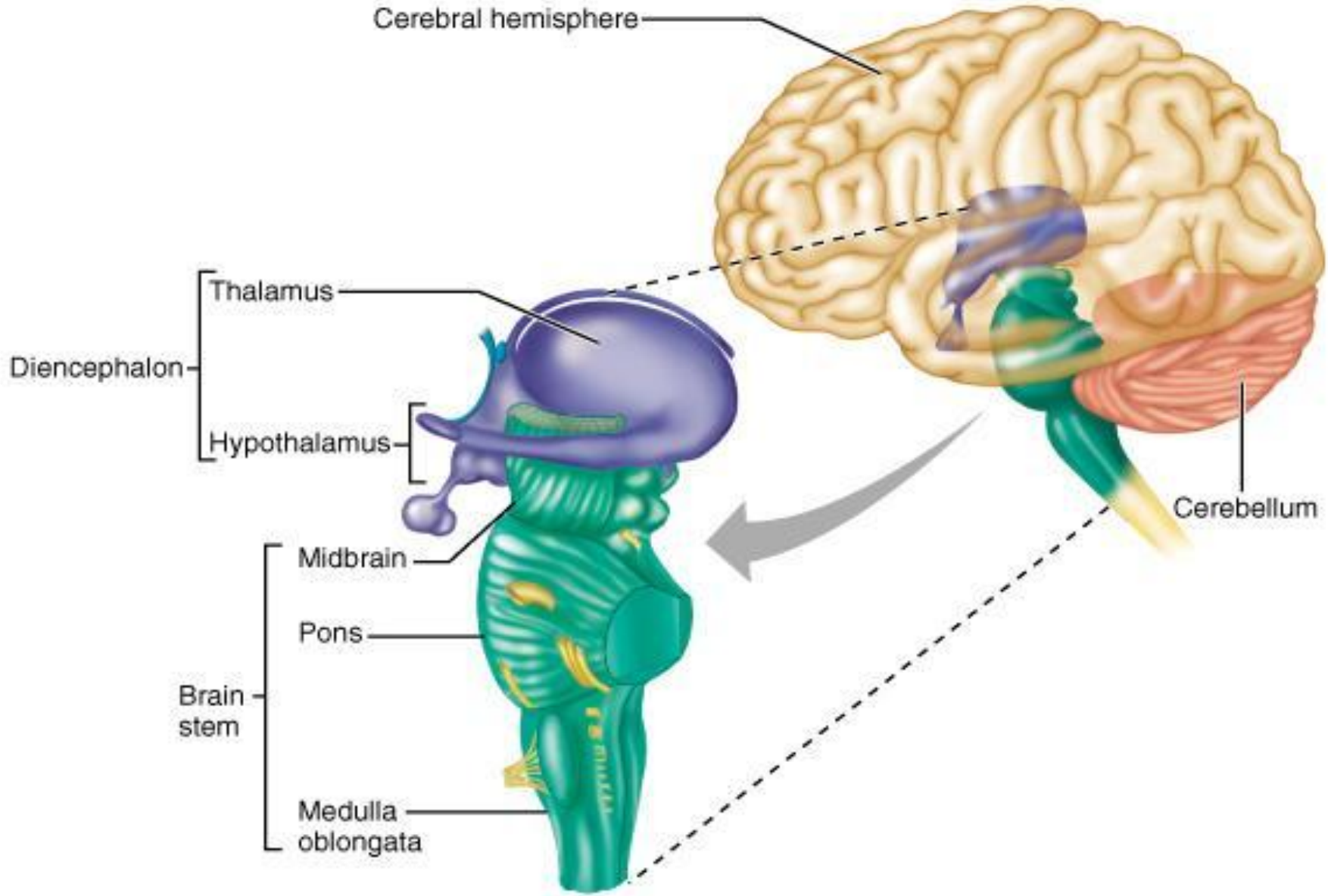
1) FORM THE BULK OF THE CRANIAL VAULT
2) FORMS SUTURES WITH THE OTHER BONES (4)

- * SUTURAL BONES ----- SMALL BONES OCCURING WITHIN THE SUTURES(LAMDOID SUTURE)
- **OCCIPITAL BONE (FEATURES)**
- 1) FORMS THE POSTERIOR PART OF THE CRANIUM AND THE BASE
- 2) INTERNALLY FORMS THE POSTERIOR CRANIAL FOSSA(CONTAINS THE CEREBELLUM)
- 3) FORAMEN MAGNUM
- 4) OCCIPITAL CONDYLES
- 5) HYPOGLOSSAL CANAL

BRAIN

THE AVERAGE HUMAN BRAIN WEIGHS 1500 g or 3.3 POUNDS
IT CARRIES OUT COMPLEX NEURAL FUNCTIONS.

DEVELOPMENT-BRAIN ARISES FROM THE ROSTRAL(SUPERIOR)
PART OF THE NEURAL TUBE
ORGANIZATION OF THE BRAIN-
1. CEREBRAL HEMISPHERES
2. DIENCEPHALON-THALAMUS, HYPOTHALAMUA AND EPITHALAMUS
3. BRAINSTEM-MIDBRAIN,PONS AND MEDULLA OBLANGATA
4. CEREBELLUM
ALL THESE PARTS WORK TOGETHER AND ARE INTERCONNECTED

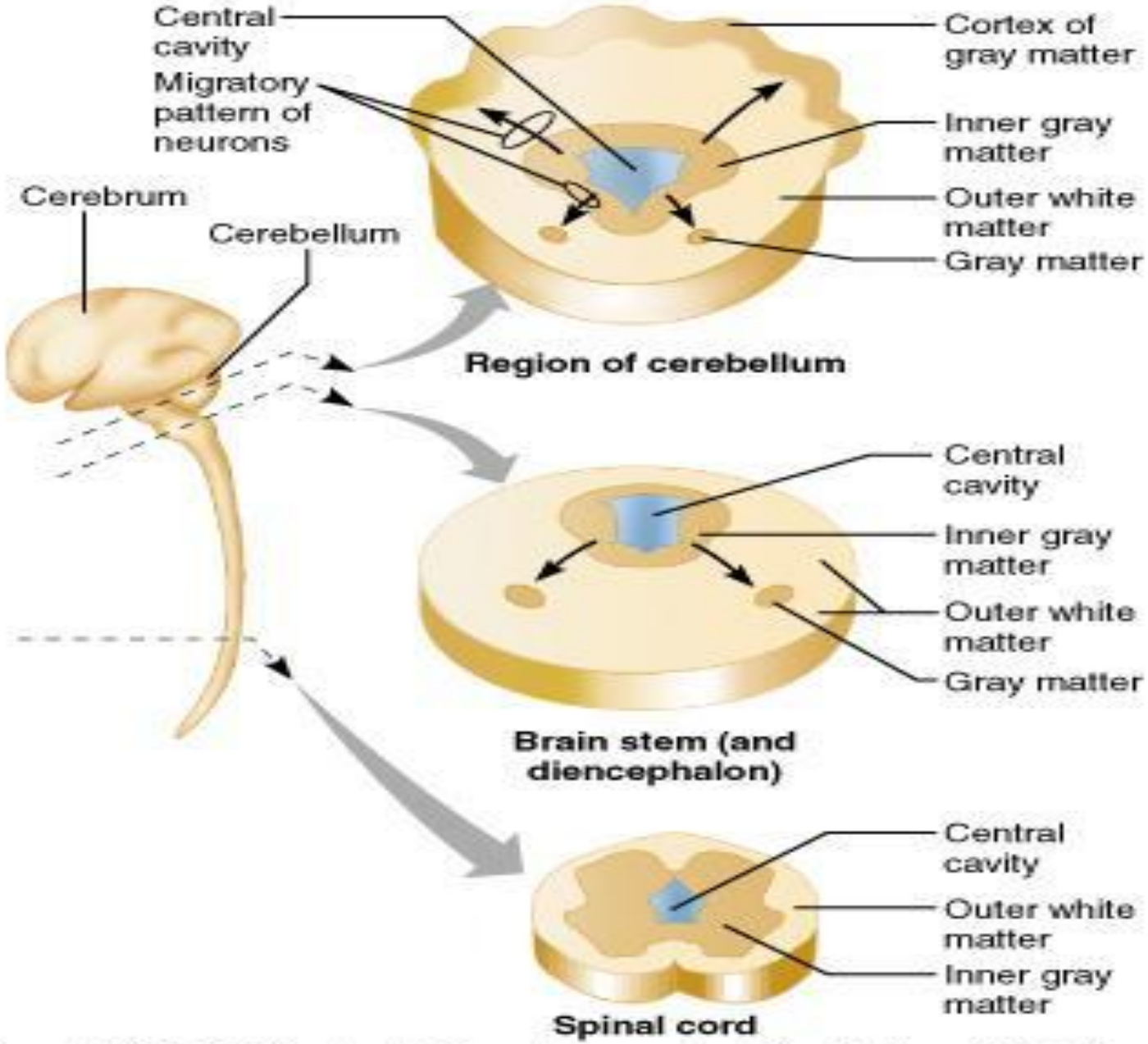


CEREBRAL HEMISPHERES

- THIS CONSTITUTES SEVEN-EIGHTS OF THE TOTAL WT OF THE BRAIN, OCCUPIES MOST OF THE CRANIUM.
- CONSISTS OF 2 CEREBRAL HEMISPHERES SEPERATED BY A LONGITUDINAL FISSURE

-THE SURFACE OF THE CEREBRUM IS GRAY MATTER(CONTAIN CELL BODY OF NEURONS,DENDRITES AND UNMYELINATED AXONS), THERE ARE PARTS OF GRAY MATTER DEEPER WITHIN THE WHITEMATTER (BASAL NUCLEI). CALLED THE CORTEX

-INTERNAL TO THE GRAY MATTER IS THE WHITE MATTER(MADE UP OF MYELINATED AXONS AND DENDRITES



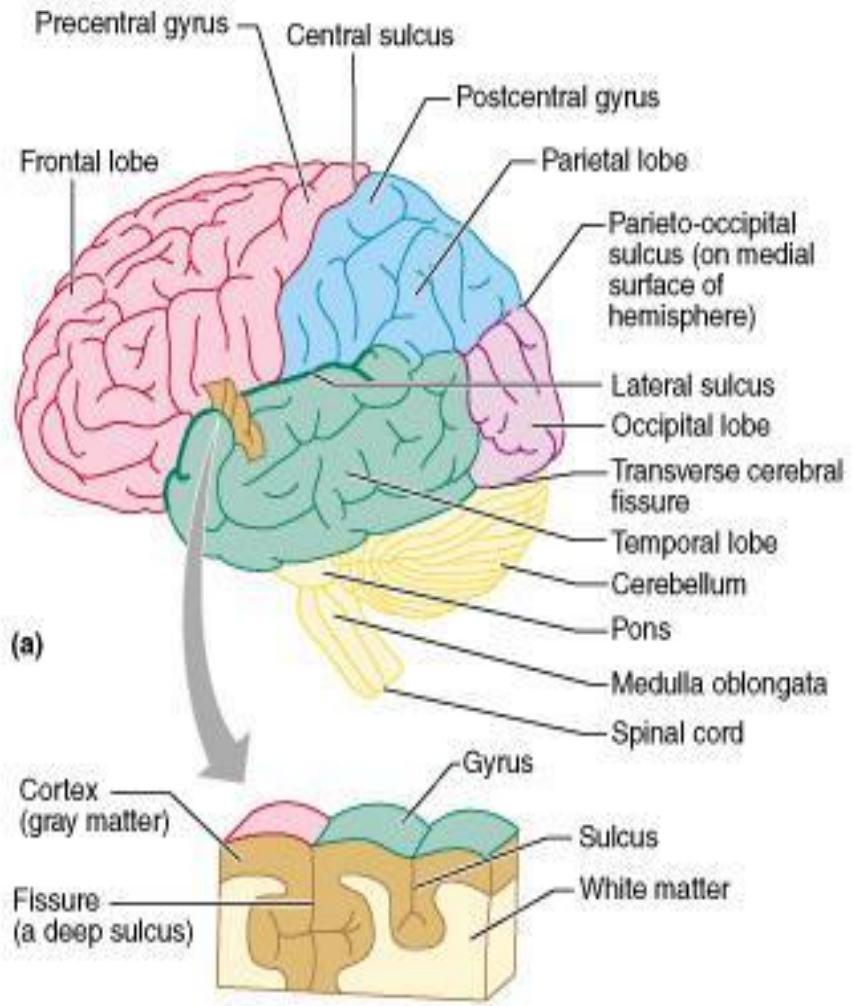
CEREBRAL GRAY MATTER (CORTEX)

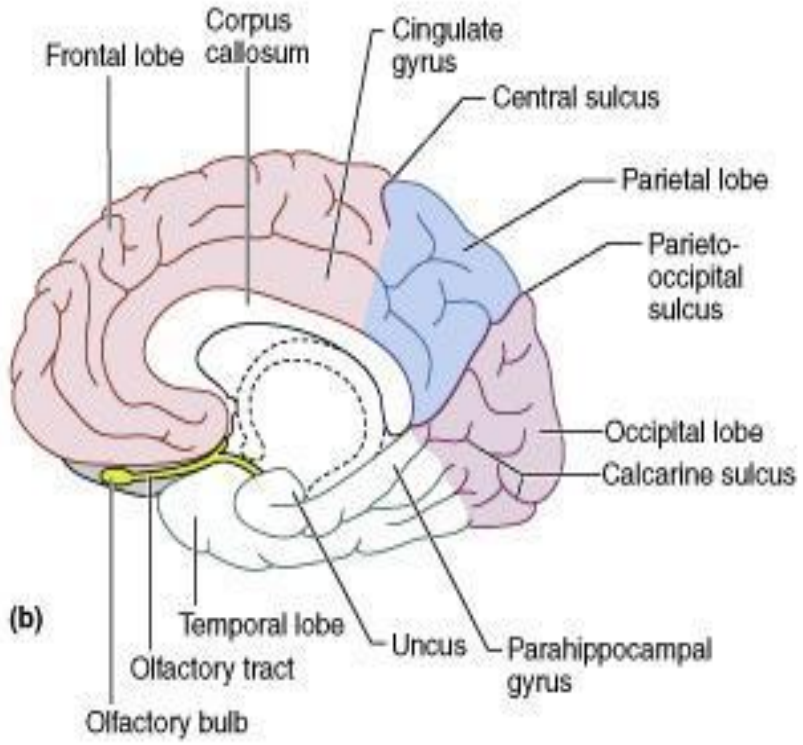
- **SURFACE STRUCTURES-**
  -2-4 MM THICK, FOLDED TO FORM SULCI (GROOVES)AND GYRI(RIDGES)
  -DEEPER SULCI DIVIDE EACH CEREBRAL HEMISPHERE INTO 5 MAJOR LOBES- FRONTAL, PARIETAL,OCCIPITAL,TEMPORAL AND INSULA.

GENARAL FUNCTIONAL AREAS-

1. MOTOR-CONTROLS VOLUNTARY MOTOR FUNCTIONS
2. SENSORY AREA-PROVIDES FOR CONCIOUS AWARENESS OF SENSATION
3. ASSOCIATION AREA-INTEGRATE DIVERSE INFORMATION , TO ENABLE A PURPOSEFUL ACTION

LOBES OF THE BRAIN



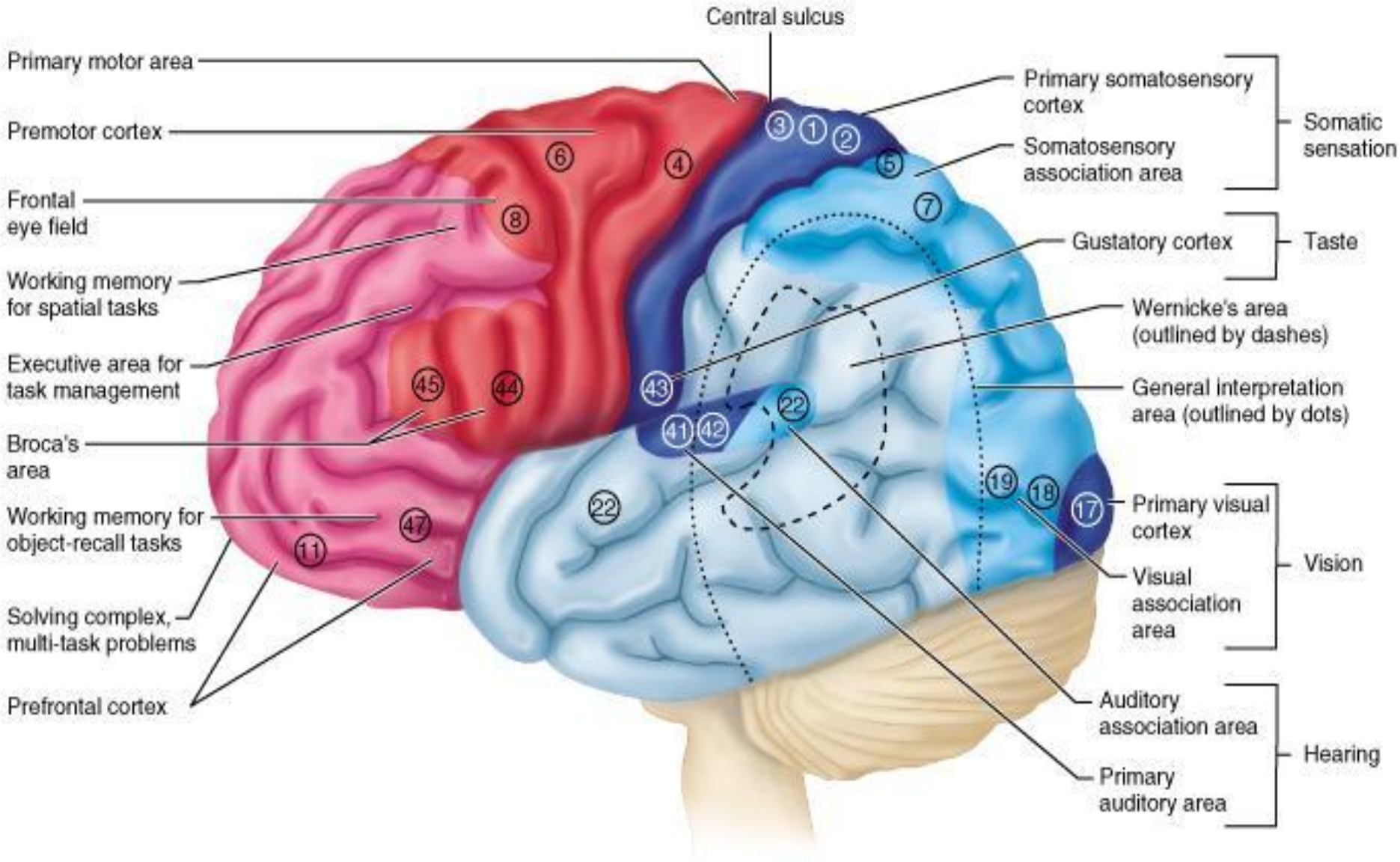


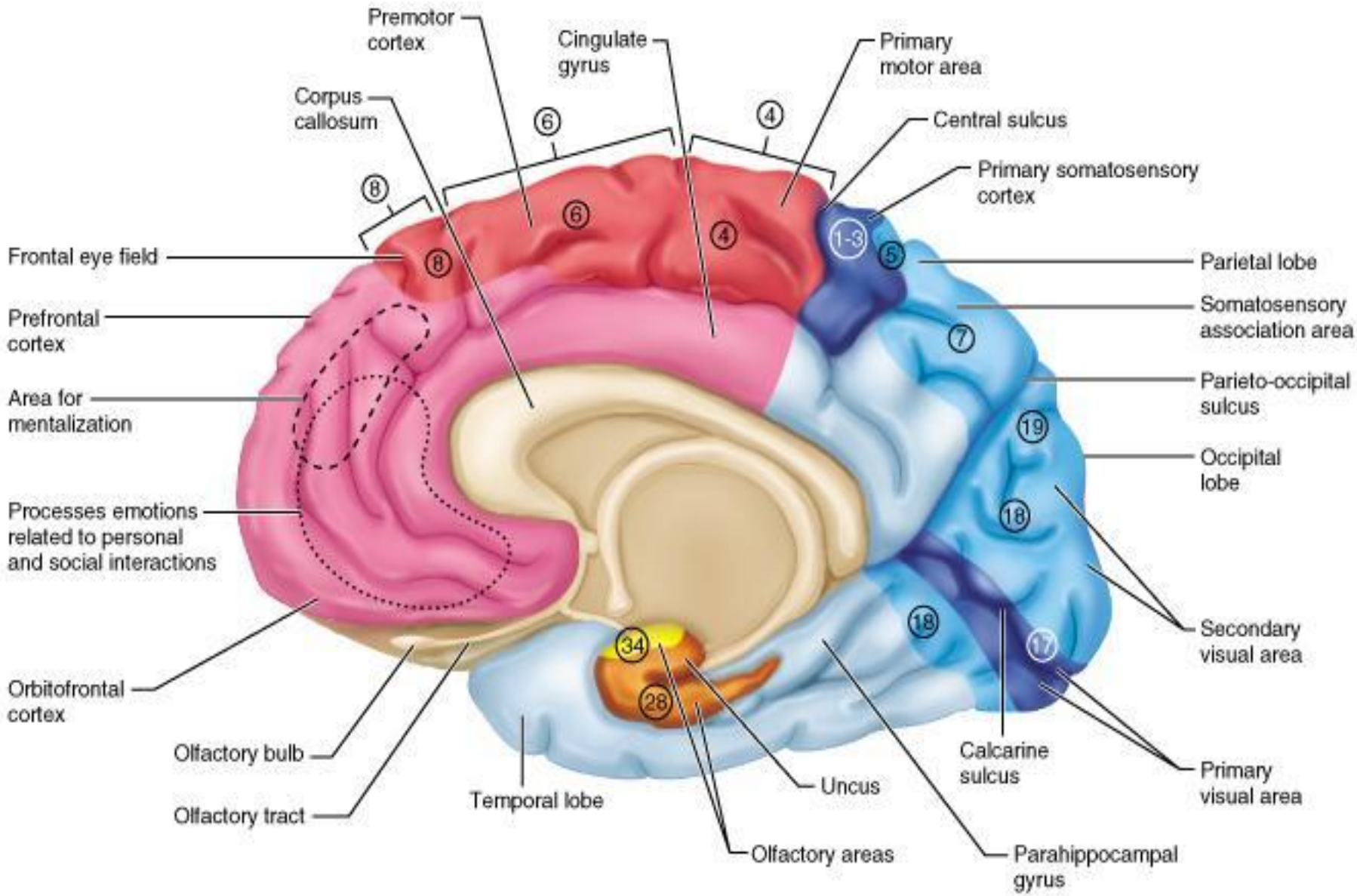
MOTOR AND ASSOCIATION AREAS

- PRIMARY MOTOR AREA- LOCATED IN THE PRECENTRAL GYRUS OF THE FRONTAL LOBE. BROADMANS AREA-4.THE CORTICOSPINAL TRACTS ARISE HERE(MOTOR CONTROL)
- PREMOTOR CORTEX- LIES ANTERIOR TO THE PRECENTRAL GYRUS, BROADMANS AREA -6, THIS IS AN ASSOCIATION AREA.
- PREFRONTAL CORTEX-LIES JUST ANTERIOR TO THE PREMOTOR CORTEX.PERFORMS COGNITIVE FUNCTIONS(THINKING, PERCIEVING, REMEMBERING AND RECALLING INFORMATION
- THE FRONTAL EYE FIELD CONTROLS VOLUNTARY MOVEMENTS OF THE EYE.FOLLOWING A MOVING OBJECT BROADMANS AREA -8
- BROCA'S AREA- LIES ANTERIOR TO THE INFERIOR PART OF THE PREMOTOR CORTEX .BROADMANS AREA 44-45.SPEECH AREA. PRESENT IN THE DOMINANT HEMISPHERE

SENSORY AND ASSOCIATION AREAS

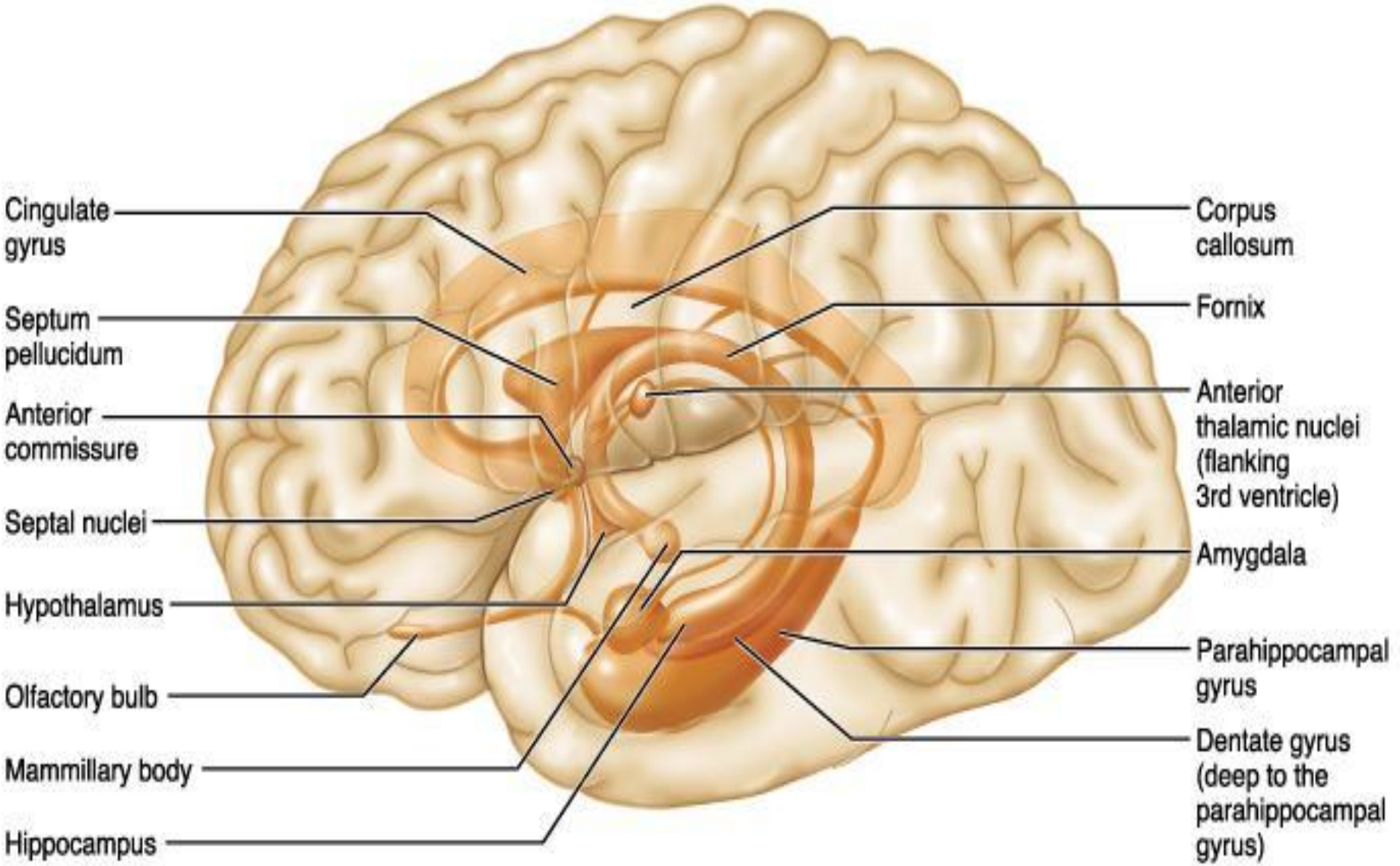
- **PRIMARY SENSORY AREA-** LOCATED IN THE POST CENTRAL GYRUS OF THE PARIETAL , JUST POSTERIOR TO THE PRIMARY CORTEX. CORRESPONDS TO BROADMANS AREA 1-3. INVOLVED WITH CONCIOUS AWARENESS OF SENSATIONS
- **SOMATOSENSORY ASSOCAIATION AREAS-LIES** POSTERIOR TO THE PRIMARY SENSORY AREA. BROADMANS AREA 5-7. INTEGRATES SENSORY INPUTS
- **PRIMARY VISUAL AREA-** PRESENT IN THE POSTERIOR AND MEDIAL PART OF THE OCCIPITAL LOBE. BROADMANS AREA 17. IF DAMAGED LEADS TO CORTICAL BLINDNESS.
- **VISUAL ASSOCIATION AREAS-** BROADMANS AREA 18-19.FOR COLOR, FORM AND MOVEMENT
- **PRIMARY AUDITORY AREA -** PRESENT AT THE SUPEROR EDGE OF THE TEMPORAL LOBE .BROADMANS AREA 41,42
- **AUDITORY ASSOCIATION AREA-JUST** POSTERIOR TO THE PRIMARY AUDITORY AREA. MEMORIES OF PAST SOUND ARE STORED HERE.
- **WERNICKES AREA-AREA** INVOLVED IN COMPREHENSION OF SPEECH





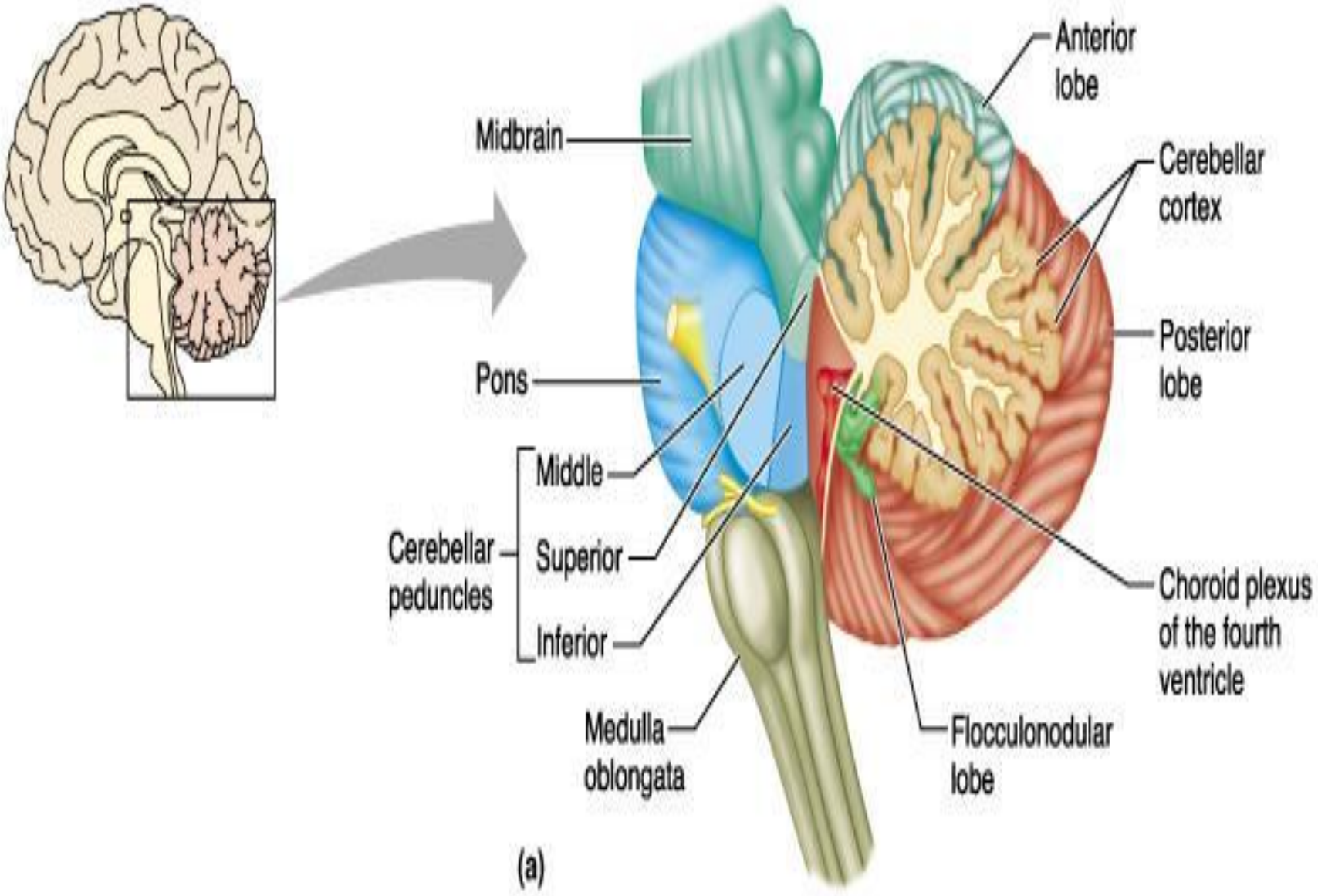
LIMBIC SYSTEM(EMOTIONAL BRAIN)

- THIS IS A GROUP OF STRUCTURES ON THE MEDIAL SIDE OF EACH CEREBRAL HEMISPHERE AND DIENCEPHALON
- RESPONSIBLE FOR EMOTIONAL STATES OF BEHAVIOUR(FEAR , ANGER , SADNESS)-BRINGS ABOUT APPROPRIATE BEHAVIOUR
- RESPONSIBLE FOR SHORT TERM MEMORY
- COMMUNICATES WITH OTHER REGIONS OF THE BRAIN.



CEREBELLUM

- MAKES UP A FOURTH OF THE BRAINS MAJOR PARTS
- MAKES UP 11% OF THE MASS OF THE BRAIN
- ALSO CALLED THE LESSER BRAIN
- CONSISTS OF 2 HEMISPHERES CONNECTED BY THE VERMIS
- HAS OUTER GRAY MATTER, INNER WHITE MATTER, DEEPER AREA OF GRAY MATTER THE CEREBELLAR NUCLEI
- FUNCTIONALLY IT SMOOTHS AND COORDINATES BODY MOVEMENTS THAT ARE DIRECTED BY OTHER BRAIN REGIONS, AND HEPLS MAINTAIN POSTURE AND EQUILIBRIUM.
- IN ORDER TO PERFORM THE ABOVE FUNCTIONS IT IS CONNECTED TO OTHER PARTS OF THE BRAIN VIA CEREBELLAR PUDUNCLES, THE SUPERIOR, MIDDLE AND INFERIOR.



BRAINSTEM

- THE 3 REGIONS OF THE BRAINSTEM ARE THE MIDBRAIN, PONS AND MEDULLA OBLONGATA
- **MIDBRAIN**

- IT HAS A CENTRAL CAVITY CALLED THE CEREBRAL AQUEDUCT WHCH DIVIDES IT INTO 2 PARTS
- CEREBRAL PUDUNCLES LIE VENTRALLY
- TECTUM LIES DORSALLY, WHICH ARE MADE UP OF NUCLEI CALLED THE CORPORA QUADRIGEMINA (SUPERIOR COLLICULI- ASSOCIATED WITH VISUAL REFLEXES, INFERIOR COLLICULI- ASSOCIATED WITH AUDITORY REFLEXES
- THE SUPERIOR CEREBELLAR PUDUNCLES CONNECT THE MIDBRAIN TO THE CEREBELLUM

- **PONS-**

IT IS THE BRIDGE BETWEEN THE RT AND LEFT HALVES OF THE CEREBELLUM

THERE ARE CRANIAL NERVES ATTACHED TO IT, THE 5^{TH}, 6^{TH} AND 7^{TH}.

IT IS ATTACHED TO THE CEREBELLUM VIA THE MIDDLE CEREBELLAR PUDUNCLE

MEDULLA OBLONGATA

-IT IS CONTINOUS WITH THE SPINAL CORD AT THE LEVEL OF THE FORAMEN MAGNUM

-THE CRANIAL NERVES ATTACHED TO IT ARE THE 8^{TH}, 9^{TH}, 10^{TH} ,11^{TH} AND 12^{TH}

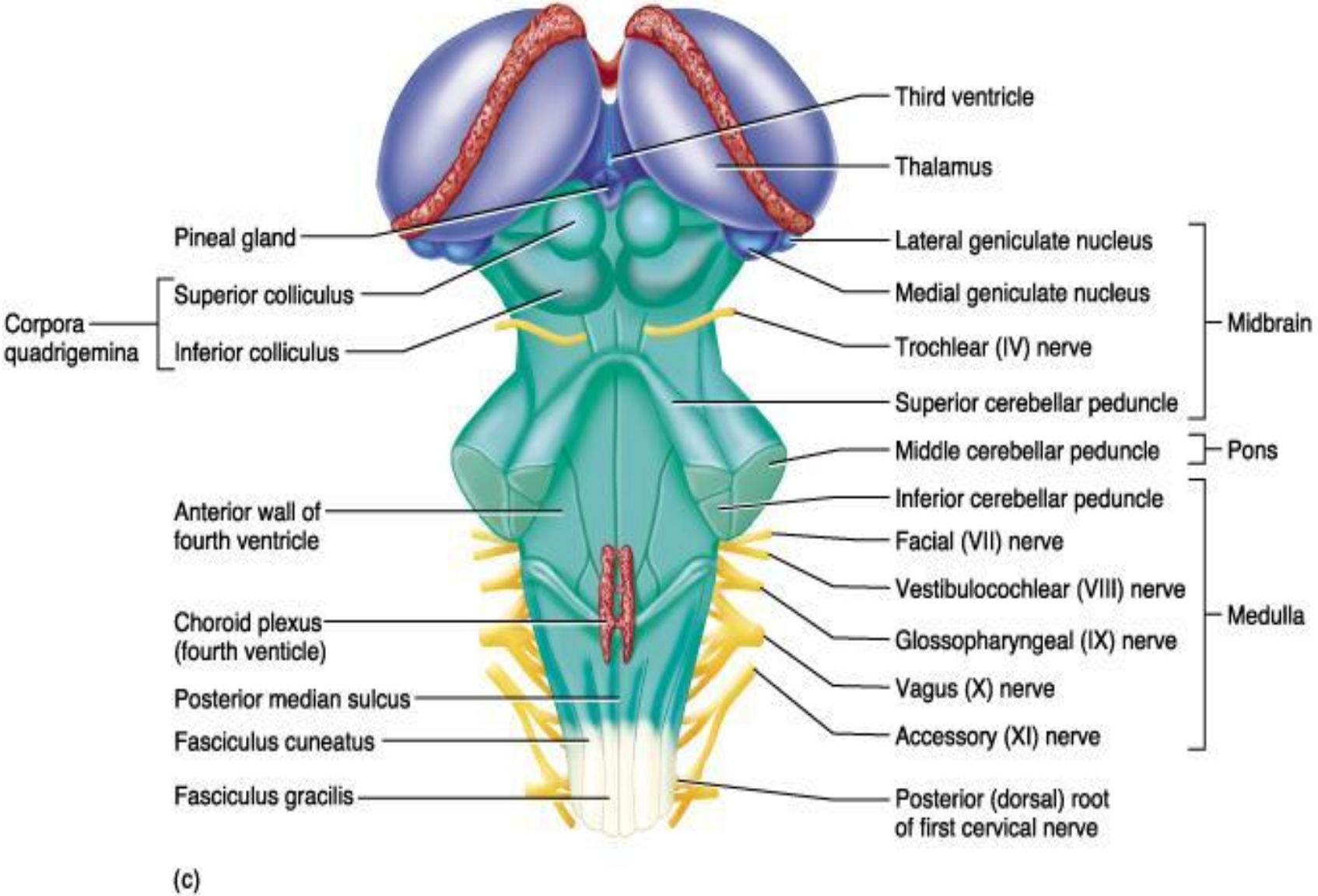
-IT IS ATTACHED TO THE CEREBELLUM VIA THE INFERIOR CEREBELLAR PUDUNCLE

RETICULAR FORMATION

THIS RUNS THROUGH THE CENTRAL CORE OF THE PONS, MIDBRAIN AND MEDULLA

CONSISTS OF LOOSE CLUSTER OF NEURONS

FORMS THE RETICULAR ACTIVATING SYSTEM-MAINTAINING CONCIOUSNESS AND ALERTNESS



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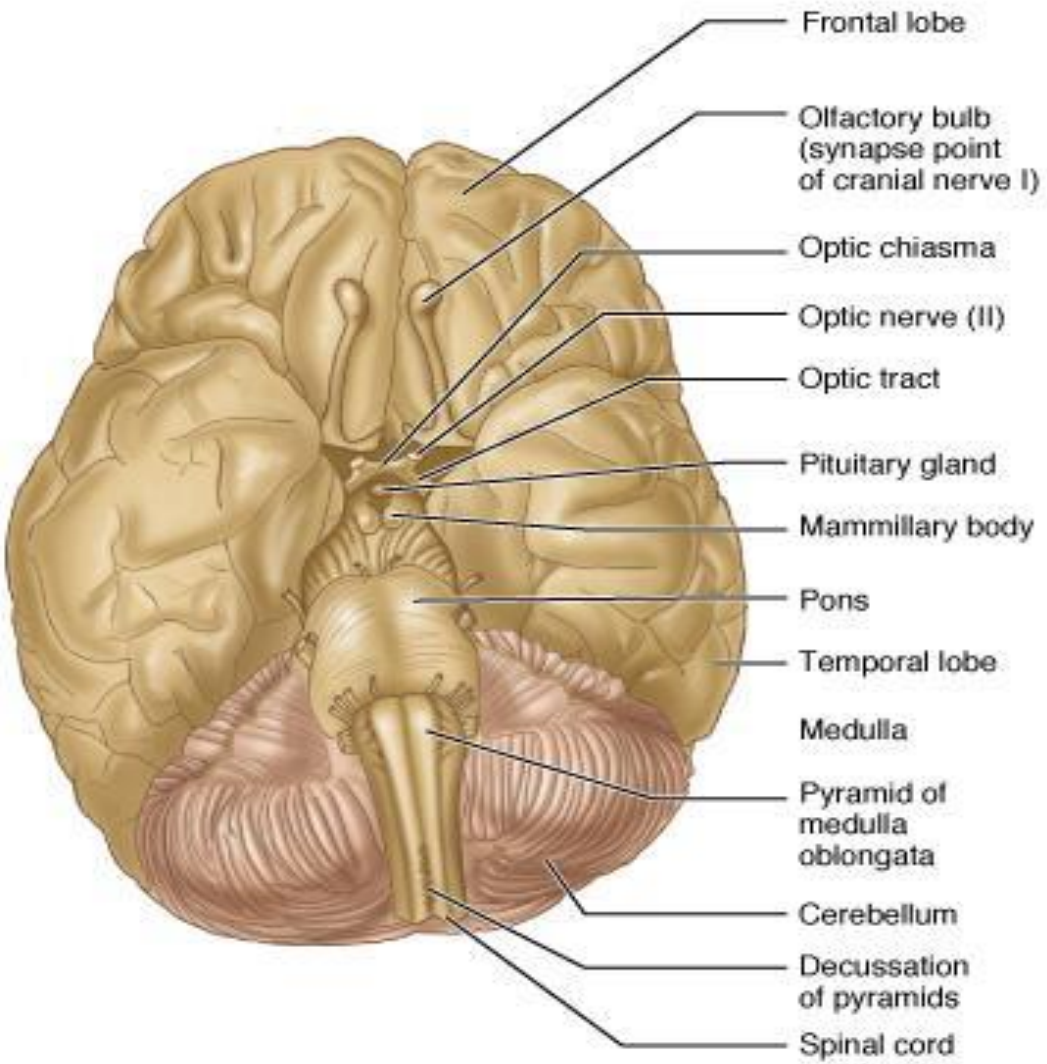


DIENCEPHALON

- PARTS ARE THE THALAMUS, HYPOTHALAMUS AND EPTHALAMUS
- **THALAMUS**

MAKES UP 80% OF THE DIENCEPHALON

IMPORTANNT NUCLEI(GRAY MATTER) ARE PRESENT

IT IS A RELAY STATION

HYPOTHALAMUS

LIES BELOW THE THALAMUS

PROJECTING FROM THE INFERIOR ASPECT IS THE PITUITARY GLAND THAT SECRETES HORMONES

CONTAINS NUCLEI(GRAY MATTER)

IT IS THA MASTER CONTROL CENTER REGULATING THE ACTIVITIES OF THE VISCERAL ORGANS

EPTHALAMUS

CONSISTS OF NUCLEI AND THE PINEAL BODY

UNDER THE INFLUENCE OF THE HYPOTHALAMUS IT SECRETS MELATONIN (SLEEP CYCLE)

PROTECTION OF THE BRAIN

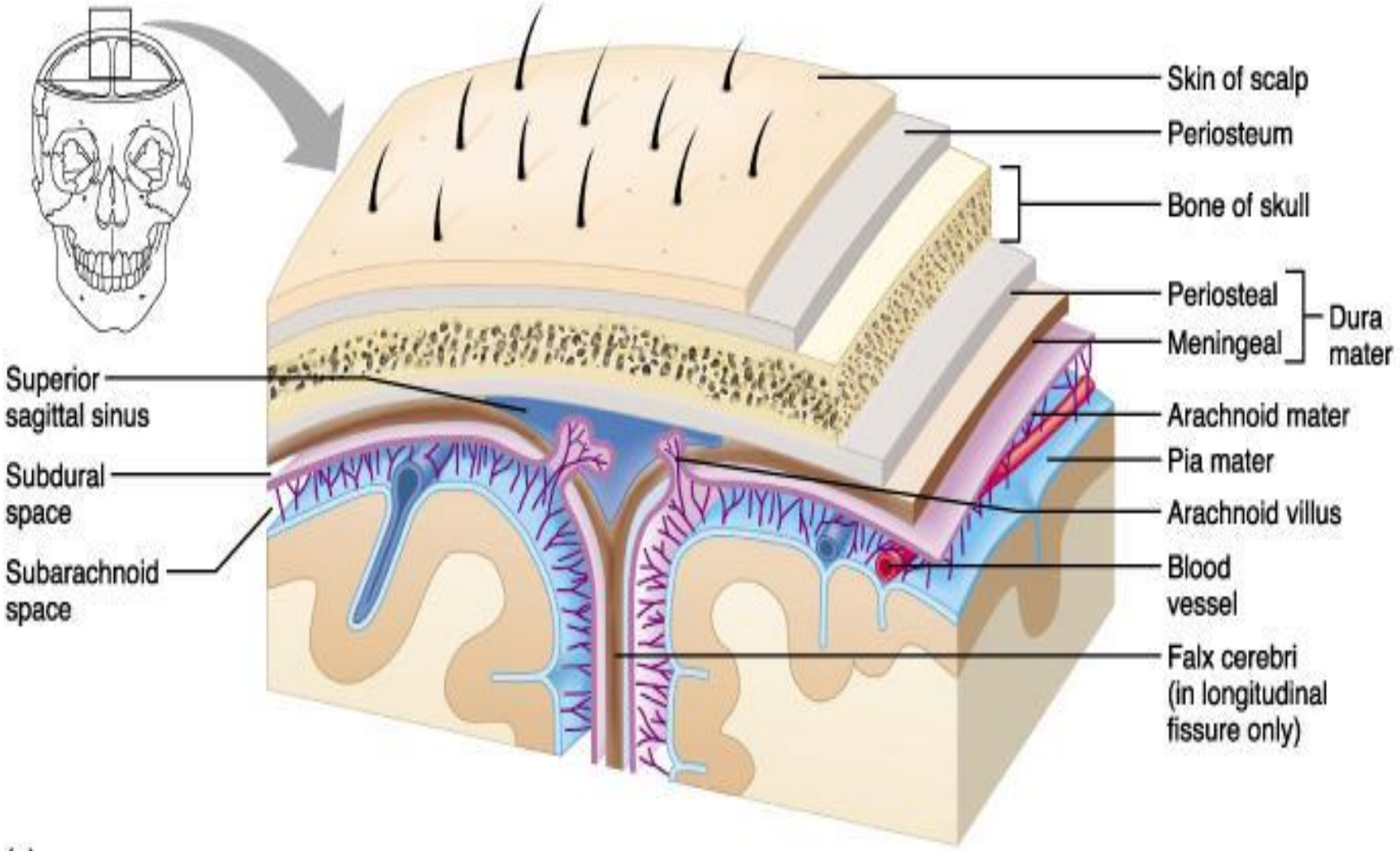
CNS PROTECTION

BONE

MENINGES

a) dura mater
b) arachnoid mater
c) pia mater

3. Cerebrospinal fluid
   a) in the ventricles and subarachnoid space
   b) circulation: choriod plexus -------superior sagittal sinus
   c) lumbar puncture (spinal tap)
4. Blood brain barrier



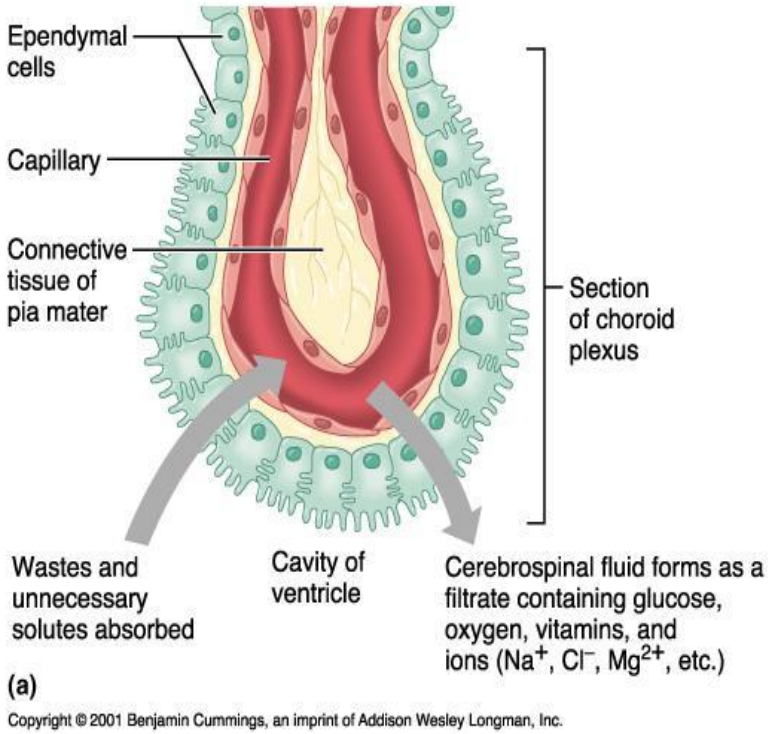
(a)

MENINGES

- CONNECTIVE TISSUE
- COVERS AND PROTECTS THE CNS
- ENCLOSE AND PROTECTS THE BLOOD VESSELS SUPPLYING THE CNS
- CONTAINS CSF
- READ UP DETAILS OF THE MENINGES FROM THE BOOK PAGES 374-377

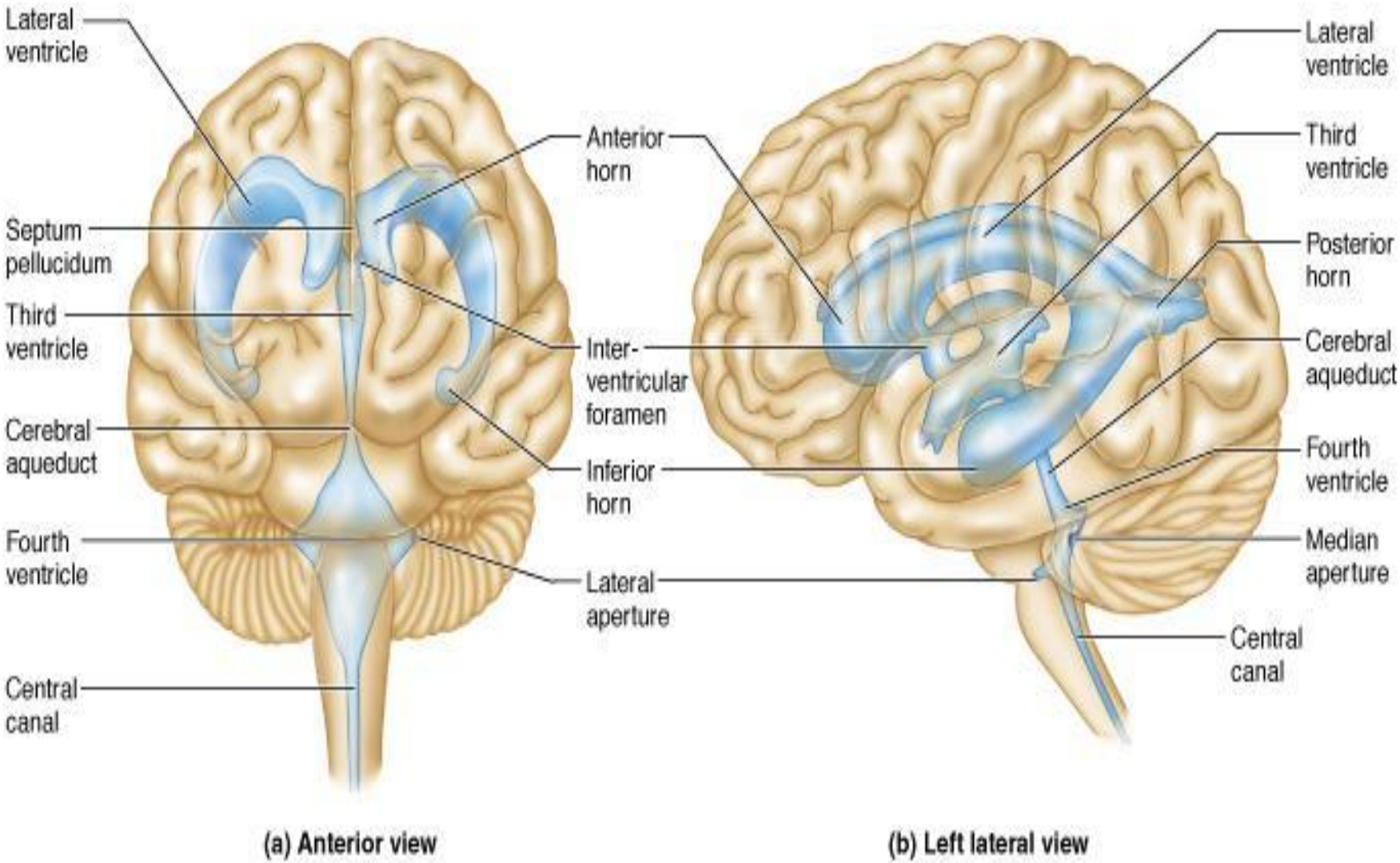
CSF

- CSF PRESENT AROUND THE BRAIN AND SPINAL CORD
- REDUCES THE WT OF THE BRAIN BY 97%
- 100-160 ML
- FORMED IN THE CHOROID PLEXUS



VENTRICLES OF THE BRAIN

- EXPANSIONS OF THE BRAINS CENTRAL CAVITY ---- CONTAIN CSF
- CONTINOUS WITH EACH OTHER AND THE CENTRAL CANAL OF THE SPINAL CORD
- 1. LATERAL VENTRICLE---- CEREBRAL HEMISPHERES
- 2. THIRD VENTRICLE---DIENCEPHALON
- 3. MIDBRAIN---CERBRAL AQUEDUCT
- 4. HINDBRAIN---- FOURTH VENTRICLE



(a) Anterior view

(b) Left lateral view