

# **Histology**

**Past papers**

**(Final 2020)**

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**1.An osteon is:**

- a.A cylinder of bone tissue surrounding a central canal
- b.A porous bone composed of trabeculated bone tissue
- c. Involved in the formation of outer circumferential lamellae
- d. The basic structural unit of spongy bone
- e. Composed of woven bone

Answer: a

**2.Hydroxyapatite crystals are made mainly from the combination of:**

- a) Collagen type 1 fibers and carbon molecules
- b) Calcium, phosphate and collagen type 1 fibers
- c) Calcium and phosphate
- d) Chondroitin sulfate and inorganic salts
- e) Glycoproteins and vitamin D

Answer: c

**3.White fibers, choose the CORRECT statement:**

- a)Are smaller in diameter compared to red fibers
- b) Their oxidative capacity is high
- c)Can be differentiated from red fibers using H & E
- d) Their glycolytic capacity is high
- e) Their ATPase activity is low

Answer: d

**4.Which the of the following cell types lines the central canal of the spinal cord and the ventricular system of the brain?**

- a) Microglia
- b) Oligodendrocytes
- c) Ependymal cells
- d)Astrocytes
- e) Schwann cells

Answer: c

**5.Characteristics of smooth muscle fibers are:**

- a) Spindle shaped, branched, unstriated, uninucleate and involuntary

- b) Spindle shaped, unbranched, unstriated, multinucleate and involuntary
- c) Spindle shaped, unbranched, unstriated, uninucleate and involuntary
- d) Cylindrical, unbranched, unstriated, uninucleate and involuntary
- e) Spindle shaped, branched, striated, uninucleate and involuntary

Answer: c

**6. Osteocytes maintain contact with the blood vessels of the central canal through:**

- a) Concentric lamellae
- b) Interstitial lamellae
- c) Canaliculi
- d) Perforating fibers
- e) Periosteum

Answer: c

**7. Ganglia of nervous system, choose the CORRECT statement:**

- a) Cells of autonomic ganglia are pseudounipolar neurons
- b) Autonomic ganglia are masses of neuronal cell bodies of postganglionic neurons
- c) Cells of sensory ganglia are multipolar neurons
- d) Sensory ganglia contain synapse
- e) Autonomic ganglia do not contain synapse

Answer: b

**8. Schwann cells are characterized by the followings EXCEPT:**

- a) Each Schwann cell myelinates only one internodal segment of one axon
- b) They are interrupted by nodes of Ranvier
- c) They play a role in regeneration of axons in peripheral nervous system
- d) They are similar in function to astrocytes of central nervous system
- e) They support both myelinated and unmyelinated axons in the peripheral nervous system

Answer: d

**9. Neuroglial cells, choose the WRONG statement:**

- a) Are smaller in size compared to neurons
- b) Are not able to transmit nervous impulses
- c) Are able to undergo mitosis
- d) Are found in both peripheral and central nervous systems
- e) Are less numerous compared to neurons

Answer: e

**10. The triad in skeletal muscle, choose the WRONG statement:**

- a) Is visible by light microscopy
- b) Is found at the site of A-I band junction
- c) Includes two terminal cisternae of sarcoplasmic reticulum
- d) Includes part of T tubule
- e) Is involved in the process of initiating muscle contraction

Answer: a

**11. All the followings can be found in the ossification zone EXCEPT:**

- a) Chondrocyte within lacunae
- b) Osteocyte within lacunae
- c) Primary bone
- d) Calcified matrix of the cartilage
- e) Osteoblasts

Answer: a

**12. Which of the following is the correct layering of the connective sheaths of a peripheral nerve from the superficial to deep?**

- a) Endoneurium, perineurium, epineurium
- b) Perineurium, epineurium, endoneurium
- c) Epineurium, endoneurium, perineurium
- d) Epineurium, perineurium, endoneurium
- e) Epineurium, endoneurium, perineurium

Answer: d

**13. All of the following statements about bone cells are correct EXCEPT:**

- a) Osteoblasts produce type I collagen
- b) Osteocytes are often grouped in nests inside lacunae as a result of earlier mitoses
- c) Osteoblasts are mononucleate cells

- d) Osteoclasts form the ruffled border that opposes the surface of the bone tissue
- e) Some osteoblasts turn into osteocytes while the new bone is being formed

Answer: b

**14. Articular cartilage:**

- a) None of the mentioned.
- b) Is devoid of periosteum.
- c) All of the mentioned.
- d) Exhibits a high regenerative capacity.
- e) Is a fibrocartilage.

Answer: a

**15. The neuron conducting an impulse from the stomach wall to the central nervous system would be classified as a:**

- a) Somatovisceral
- b) Visceral afferent
- c) Visceral efferent
- d) Somatic afferent
- e) Somatic efferent

Answer: b

**16. Elastic cartilage is present in:**

- a) External ear.
- b) External acoustic meatus.
- c) Costal cartilages.
- d) There is more than one correct answer.
- e) Epiglottis.

Answer: d

**17. Nervous tissue, choose the CORRECT statement**

- a) Each neuron has as a rule one primary dendrite, and never more than one primary dendrite
- b) Microtubule and neurofilaments are found in soma, dendrite, and axon
- c) Nissl bodies provide the main cytoskeletal tracks for axonal transport

- d) Bundle of axons within central nervous system is called nerve
- e) Bipolar neurons do not have axons

Answer: b

**18. Several layers of cells reside within epiphyseal plates of developing long bones. Which statement best describes the ossification zone?**

- a) Cells enlarging and causing the cartilaginous matrix to become calcified
- b) Resting cells
- c) Cells undergoing mitosis and forming long columns of isogenous groups
- d) None of the mentioned
- e) Osteoblasts adhering to the remnants of calcified cartilage matrix and producing woven bone

Answer: e

**19. Which of the following are found in compact bone and cancellous bone?**

- a) Lacunae
- b) Circumferential lamellae
- c) Haversian canals
- d) Trabeculae
- e) Volkmann's canals

Answer: a

**20. All of the followings apply to both endochondral ossification and intramembranous ossification EXCEPT:**

- a) They start prenatally
- b) The type of collagen synthesized
- c) The bone matrix is formed by osteoblasts
- d) The formation of bone collar
- e) The first bone produced is immature bone

Answer: d

**21. The axon hillock is found at:**

- a) Schwann cells
- b) The dendrites
- c) The end of the axon
- d) The origin of the axon

e) The middle of the axon

Answer: d

**22. Which characteristic is unique to skeletal muscle cells compared to cardiac and smooth muscle cells?**

- a) Often branched
- b) Multinucleated
- c) Contain centrally located nuclei
- d) Striated
- e) Lack T-tubules

Answer: b

**23. Regarding fibers in cartilage, choose the INCORRECT statement:**

- a) All of the mentioned.
- b) None of the mentioned.
- c) Collagen fibers stain well with H&E stain.
- d) Collagen type I is abundant in fibrocartilage.
- e) Collagen type II is abundant in hyaline cartilage.

Answer: b

**24. In the I band of a sarcomere of voluntary muscle:**

- a) The Z line is found
- b) There are only thick myofilaments
- c) The M line is found
- d) There are overlapping thin and thick myofilaments
- e) There are no myofilaments

Answer: a

**25. Endochondral ossification, choose the CORRECT statement:**

- a) A process of bone formation involving the replacement of a fibrous membrane
- b) Found in long bones after the closure of the epiphyses
- c) Starts postnatally
- d) Typical of the development of the clavicle
- e) In long bones, the first site of ossification occurs in the middle of diaphysis

Answer: d

**26. Woven bone, choose the WRONG statement:**

- a) Its collagen fibers are not organized into lamellae
- b) It has a lower mineral content compared to secondary bone
- c) It is the first bone tissue to appear in embryonic development
- d) It is not degraded by osteoclasts
- e) It is formed during repair of fracture sites

Answer: d

**27. Sarcoplasmic reticulum, choose the WRONG statement:**

- a) Acts as a storage site for calcium ions
- b) Is well developed in smooth muscle cells
- c) Is associated with T-tubules in striated muscle cells
- d) Is more extensive in skeletal muscle cells compared to cardiac
- e) Is visible by electron microscopy

Answer: b

**28. A sensory ganglion associated with a spinal sensory nerve root is located:**

- a) Within the organ it innervates
- b) In a chain external to the spinal column, adjacent to the vertebral bodies
- c) In the dorsal root of spinal nerve
- d) In the ventral horn of spinal cord
- e) Near the peripheral receptor organ (in skin or muscle)

Answer: c

**29. Which of the following cells is located in Howship's lacuna?**

- a) Chondroblast
- b) Osteogenic cell
- c) Osteoblast
- d) Osteocyte
- e) Osteoclast

Answer: c

**30. Intramembranous ossification, choose the WRONG statement:**

- a. Involves several points of ossification
- b. Fontanelles are areas of the newborn's skull in which the cartilage is not yet ossified

- c. Takes place in mesenchymal condensations
- d. Forms the flat bones of the skull
- e. Contributes to the growth of short bones and thickening of long bones.

Answer: b

**31. Small cells closely associated with neurons in peripheral ganglia are:**

- a) Schwann cells
- b) Satellite cells
- c) Microglia
- d) Ependymal cells
- e) Oligodendrocyte

Answer: b

**32. Regarding Axons, choose the WRONG statement:**

- a) Are mostly myelinated
- b) Conduct impulses away from perikaryon
- c) Are longer than dendrites
- d) Their cytoplasm is similar in composition to the cytoplasm of cell bodies
- e) Have nearly constant diameter

Answer: d

**33. Which of the following joints are classified as symphyses?**

- a) Saddle joints
- b) Interosseous membranes
- c) Sutures
- d) Intervertebral discs
- e) Growth plates

Answer: d

**34. Perichondrium is a:**

- a) Loose connective which contains fibroblasts, chondrogenic cells, and other elements.
- b) Reticular connective which contains fibroblasts, chondrogenic cells, and other elements.
- c) Dense connective which contains fibroblasts, chondrocytes, and other elements.
- d) Loose connective which contains chondrocytes, chondrogenic cells, and other elements.
- e) Dense connective which contains fibroblasts, chondrogenic cells, and other elements.

Answer: e

**35. Diads are usually seen in:**

- a) Smooth muscles by electron microscope
- b) Cardiac muscles by electron microscope
- c) Cardiac muscles by light microscope
- d) Skeletal muscles by light microscope
- e) Skeletal muscles by electron microscope

Answer: b

**36. Formation and growth of long bones, choose the WRONG statement:**

- a) Hyaline cartilage remains on the articular surfaces and persists through adult life
- b) The first site of ossification in long bones occurs in the middle of diaphysis
- c) Growth in diameter is due to osteoblastic activity in periosteum and osteoclastic activity in endosteum
- d) Bone collar facilitates the diffusion of oxygen and nutrients to the underlying cartilage
- e) The cartilage between the primary and secondary ossification centers is called the epiphyseal plate

Answer: d

**37. Regarding Endosteum, choose the WRONG statement:**

- a) Covers trabeculae of spongy bone
- b) Is composed of a single layer of cells
- c) Is attached to bone trabeculae by Sharpey's fibers
- d) Is involved in bone growth in width
- e) Lines the internal cavity of the bone

Answer: c

**38. In what way are cardiac muscles and skeletal muscles similar?**

- a) Both have myogenic activity
- b) Both have tubular myofibrils
- c) Both are controlled by somatic nervous system
- d) Both are highly branched
- e) Both are connected by gap junctions

Answer: b

**39. Regarding white adipose connective tissue, choose the statement:**

- a) It is distributed similarly in males and females after puberty.
- b) This tissue is poorly vascularized.
- c) The adipose cells are inactive.
- d) None of the mentioned.
- e) Leptin is secreted by the liver, and it binds to its receptors on adipose cells.

Answer: d

**40. Thin filaments of human skeletal muscle, choose the CORRECT statement:**

- a) Are attached to Z line by titin
- b) In a relaxed muscle, they completely overlap the myosin thick filaments
- c) Are anisotropic
- d) In a relaxed muscle, they present in the H zone of a sarcomere
- e) Are pulled by the thick filaments toward the center of the sarcomere during contraction

Answer: e

**41. Muscle tissue, choose the WRONG statement:**

- a) Endomysium is a loose type of connective tissue
- b) Muscle spindles are also called intrafusal muscle fibers
- c) All muscle fibers of a motor unit are of the same type (red or white)
- d) The area between two Z lines is known as a myofibril
- e) Intracytoplasmic dense bodies of smooth muscle cells functionally correspond to the Z-lines of the other muscle types

Answer: d

**42. Which of the following is present in all three types of muscle cells?**

- a) Myofilaments
- b) Myofibrils
- c) Troponin
- d) Intracytoplasmic dense bodies
- e) Caveolae

Answer: a

**43. Choose the WRONG match:**

- a) Epineurium: dense connective tissue

- b) Motor neurons: multipolar
- c) Anaxonic neuron: lack true axon
- d) Neurons: no centrioles
- e) Anterograde axonal transport: movement toward soma

Answer: e

**44. In epiphyseal plate growth, what happens when the zone of ossification overtakes the zone of resting cartilage?**

- a) All of the mentioned
- b) The hyaline cartilage of the plate is replaced by bone
- c) Longitudinal growth of the bone terminates (at least at one end)
- d) The epiphyseal plate becomes the epiphyseal line
- e) The diaphysis and epiphysis portions of the bone fuse together to form a single adult bone

Answer: a

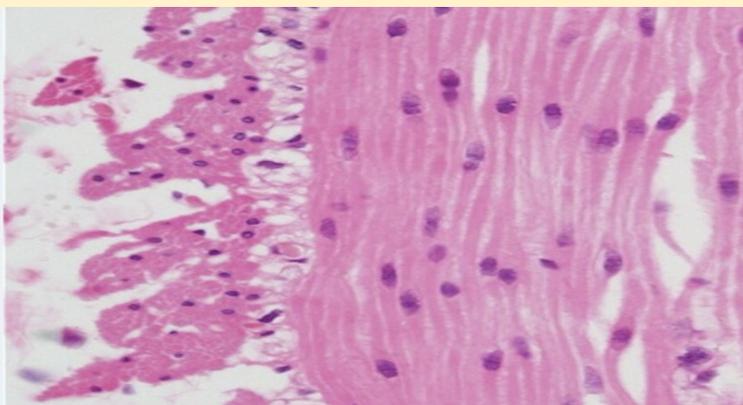
**45. Cells of smooth muscles, choose the CORRECT statement:**

- a) Their sarcolemma contains caveolae
- b) Have distinct sarcomeres
- c) Lack gap junctions
- d) Have no myofilaments
- e) Lack intermediate filaments

Answer: a

## Practical

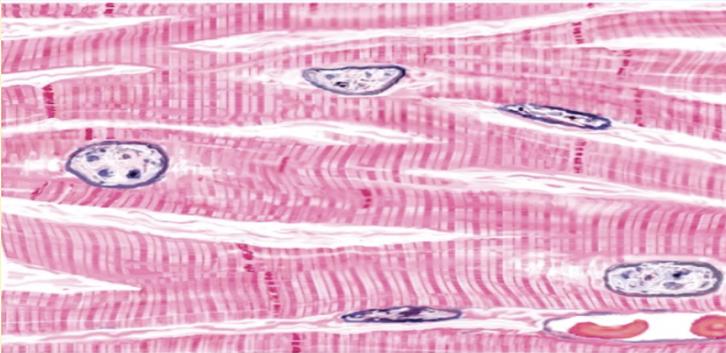
**46. Practical: Choose the CORRECT statement regarding the cells in this histological section:**



- a) Can undergo hyperplasia and hypertrophy
- b) Are multinucleated cells
- c) Have peripherally located nuclei
- d) Are branching cells
- e) Have striated cytoplasm

Answer: a

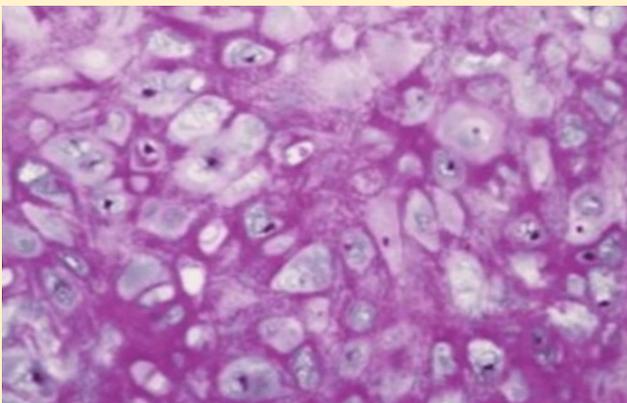
**47. Practical: Identify this histological section:**



- a) Longitudinal section of skeletal muscle cells
- b) Longitudinal section of smooth muscle cells
- c) Cross section of skeletal muscle cells
- d) Longitudinal section of cardiac muscle cells
- e) Cross section of cardiac muscle cells

Answer: d

**48. Practical: Identify this tissue:**



- a) Elastic cartilage.
- b) Hyaline cartilage.

- c) Fibrocartilage.
- d) Brown adipose tissue.

Answer: a

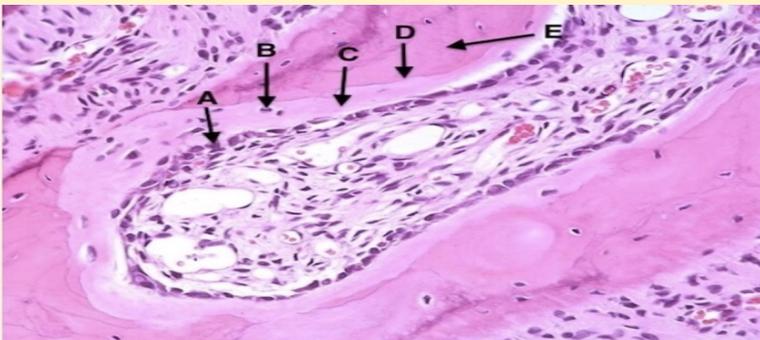
49. Practical: Identify the yellow labeled structure:



- a) Lamella
- b) Central canal
- c) Lacuna
- d) Volkmann's canal
- e) Osteon

Answer: d

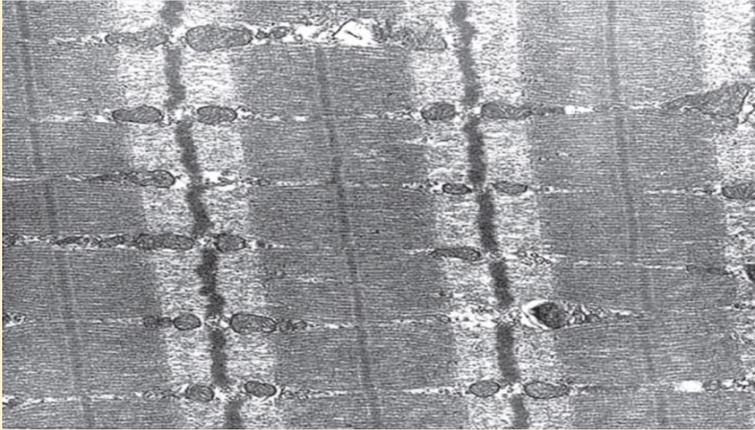
50. Practical: Choose the WRONG statement regarding this section:



- a) It is a trabecular bone
- b) Arrow A points at a bone forming cell
- c) It is a decalcified bone section
- d) Arrow B points at a cell located within lacuna
- e) Arrow C points at the mineralized bony matrix

Answer: e

51. Practical: All the followings can be labeled in this section EXCEPT:



- a) M and Z lines
- b) Sarcoplasmic reticulum
- c) A, I and H bands
- d) Mitochondria
- e) Dense bodies

Answer: e

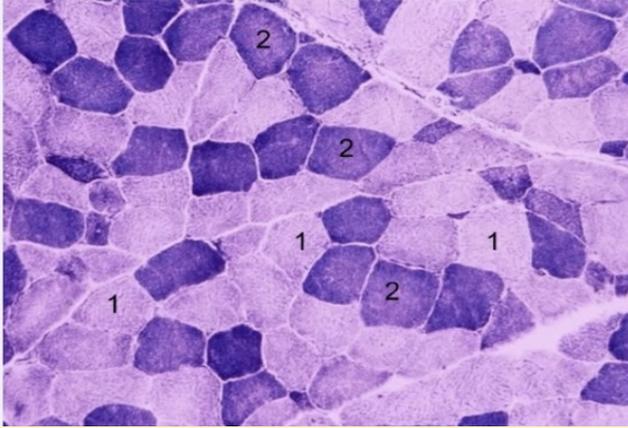
52. Practical: What type of bone formation is taking place?



- a) Endochondral ossification
- b) Intramembranous ossification

Answer: a

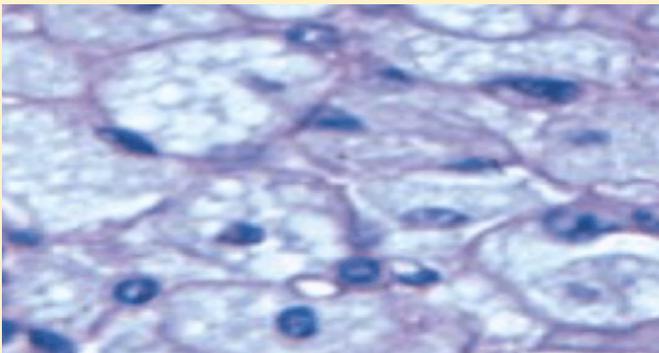
53. Practical: This histological section is stained with a specific mitochondrial stain. Which fiber type is more resistant to fatigue?



- a) Fiber 2
- b) Fiber 1

Answer: a

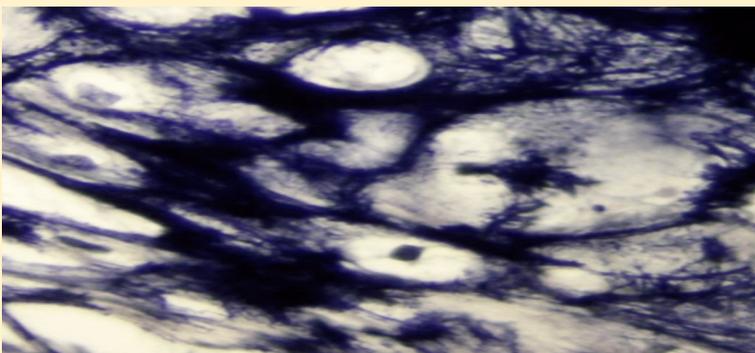
55. Practical: People in colder regions have more of this tissue:



- a) True.
- b) False.

Answer: a

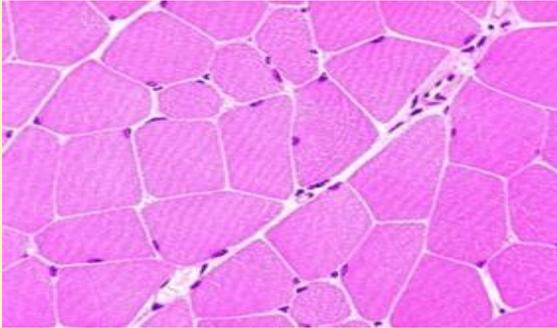
55. Practical: The black structure in this image is/are:



- a) Collagen fibers.
- b) Reticular fibers.
- c) Chondroitin sulfate.
- d) Elastic fibers.

Answer: d

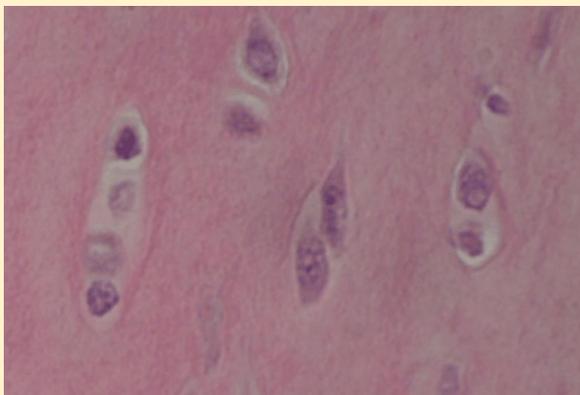
**56. Practical: Identify this histological section**



- a) Cross section of multinucleated striated muscle cells
- b) Longitudinal section of multinucleated striated muscle cells
- c) Cross section of non-striated smooth muscle cells
- d) Longitudinal section of mononucleated striated muscle cells
- e) Cross section of mononucleated striated muscle cells

Answer: a

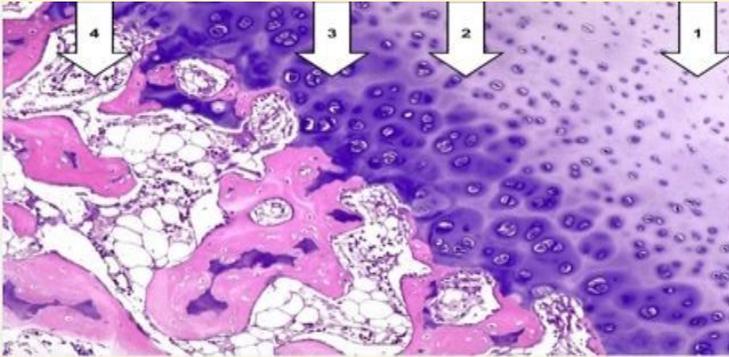
**57. Practical: Choose the CORRECT statement about this tissue:**



- a) Rich with collagen type III.
- b) It is a strong type of tissue.
- c) Stained with H&E.
- d) There is more than one correct statement.
- e) None of the mentioned.

Answer: d

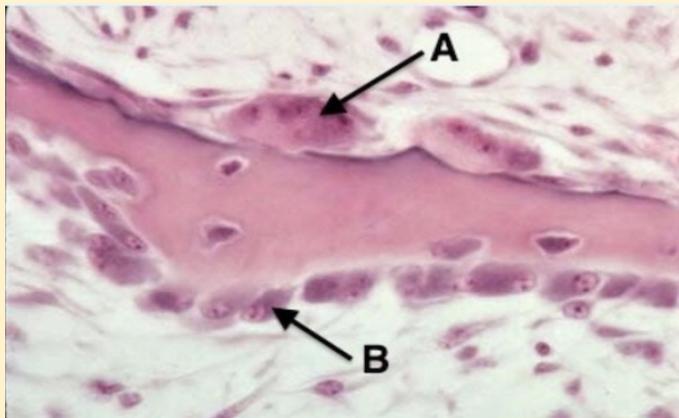
58. Practical: Choose the CORRECT match:



- a) Resting zone: 2
- b) Growth zone: 4
- c) Hypertrophy and calcification: 3
- d) Ossification zone: 1

Answer: c

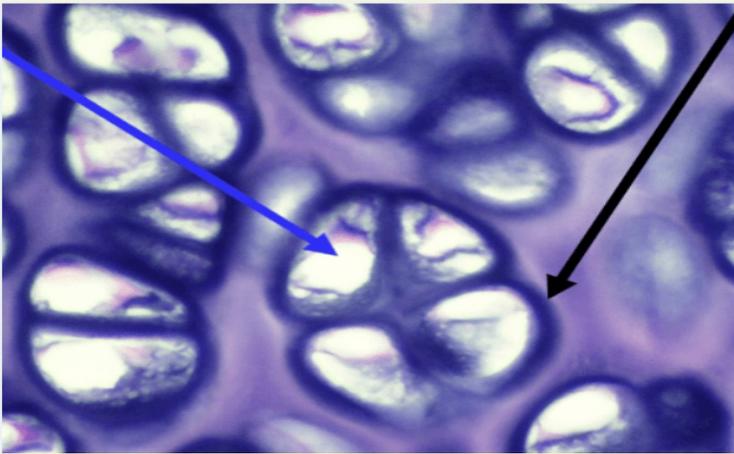
59. Practical: Identify A:



- a) Osteoblast
- b) Chondrocyte
- c) Osteoclast
- d) Fibrocyte
- e) Osteocyte

Answer: c

60. Practical: The blue and black arrows point to, respectively:



- a) The territorial matrix and the interterritorial matrix.
- b) A lacuna and the territorial matrix.
- c) A chondrogenic cell and interterritorial matrix.
- d) A lacuna and a chondrocyte.

Answer: b

