COMPILED PAST QUESTIONS: Musculo Skeletal Histology
(BONE, CARTILAGE, MUSCLE, CONNECTIVE TISSUE, GLANDS)

1. In intermembranous ossification:

A. Osteoblasts divide to give Osteocytes

B. Osteoblasts also differentiate into osteoclasts

C. Mesenchymal cells differentiate into osteoblasts which differentiate into osteoids

D. Osteoblasts lay day new bone on remains of cartilaginous matrix

2. Why do collagen fibres stain pink in Haematoxylin and eosin?

A. **The protein collagen been basic attracts acidic eosin**

B. The protein collagen been acidic attracts basic eosin

C. Glycoproteins side chains in collagen fibres are basic and attract acidic eosin

3. What is the unit structure of a myofilament in a striated muscle?

A. Sarcosomes

B. Sarcoplasm

C. Sarcolemma

D. Sarcomere

4. The smooth muscle is a cell similar to the cardiomyocyte in which of the following features?

A. Multiple nuclei per cell

B. Centrally located nucleus within the cell

C. Peripherally located nuclei

D. Lack of filaments visible in the light microscope

5. All the following are composed of predominantly smooth muscle EXCEPT:

A. Trachealis muscle

B. Arrector pili muscle

C. Uterus

D. Lip

6. Which is the histological feature that make cardiac muscle capable of contraction in a syncytial unit?

A. Branching fibers connected by intercalated discs

B. Alternating darker A-bands and lighter I-Bands

C. A bands bisected by Z discs

D. Perinuclear cytoplasm

7. During wound healing, debris arising from dead/damgaged tissue components is removed by phagocytic cells of connective tissue. Which connective tissue cell functions mainly in phagocytosis

A. Plasma cell

B. Mast cell

C. Fibroblast

D. Macrophage

8.Which is the reason why mast cell shows metachromasia with certain stains

A. Its memebrane phospholipids react eith blue stains to give crimson colour

B. It has a lot of mitochondria ehose electron transport enzymes alter the colour of the dyes to blue

C. It has cytoplasmic granules whose content of heparin and histamine alter the colour of blue dyes to red

D. Its nucleic acids alter blue dyes to red

9. What is the common or ubiquitious cell in connective tissue?

A. Adipocyte

B. Plasma cell

C. Mast cell

D. Fibroblast

10. What is the collective term for connective tissue extracellar matrix compenents including entactin, vitronnectin and thrombospendin

A. Suplhated glycosaminoglycans

B. Non- sulphated glycosaminoglycans

C. Non-collagenous structural glycoproteins

D. Protroglycans

11.What is another name for membrane specialization known as macula adherens?

A. Intermmediate junction

B. Communicating junction

C. Desmosome

D. Tight junction

12. Which of the following is a functional advantage of a stratified epithelium?

A. Basally located regenerative cells are the most protected from blood borne toxins

B. Basally located regenerative cells are protected by overlying cells from hazards that superficial cells are exposed to

C. Superficial cells depend on basal cells for nourishment

D. All cells have equal diffusion distance from capillaries in underlying lamina propria

13. An eccrine or merocrine gland is the type whose secretion is released:

A. Together with the cell that made it

B. With a copious amount of cytoplasm

C. With a thin rim of cytoplasm

D. Without any loss of cytoplasm

14. Fibrocartilage contains an abundance of …… collagen

A. Type IV

B. Type III

C. Type II

D. Type I

15. When neutrophils are attracted to a site of injury, by what process do they leave the basement membrane of blood vessles to enter to outer vascular space

A. A moeboid movement

B. Diapedesis

C. Oponization

D. Margination

16. WhAT chemical compounds released by dead or injured cells attract leucocytes to a site of injury in the body.

A.Immunoglobulin

B. Chemotaxis

C. Chemotaxins

D. Phagocytins

17. Which is the **one** reason why males tend to to grow taller than females after puberty?

A.Post-pubertal male hormone testosterone promotes sysnthesis of glycosaminoglycans in epiphyseal plate.

B.Post-pubertal female hormones, estradiol slows down synthesis of glycosaminoglycans in cartilage

C.Epiphyseal plate of long bones ossify early in females because of comparatively early puberty.

D.All of the above

18. Which is the type of gland in which the secretory cell raptures to release its secretions?

A. Eccrine

B. Apocrine

C. Merocrine

D. Holocrine

19. One characteristic of pseudostratified columnar epithelium is that all cells:

A. Rest on a basement membrane

B. Have oval nuclei

C. Are ciliated

D. Have a free surface

20. The nexus or gap junctions is a circular pitch containing tiny pores which allow passage of ions and nutrients between adjacent cells . Each pore comprises protein molecules that are aligned to those of adjacent cells to form channels known as:

A.Connexins(

B.B. Connexons (ANS)

C. Connections

D Connectors

21.Which specialized contact between epithelial cells is also known as communication junction?

A. Gap

B. Tight

C. Adherent

D. Desmosome

22. Gap junctions are found in all mammalian tissues except which of the following:

A. Cardiac muscle

B. Smooth muscle

C. Skeletal muscle

D. A and B but not C

23. Striated muscle is found in ALL of the following except:

A. Thin skin

B. Epiglottis

C. Uterus

D. Lung (Bronchiole)

24. Which of the following cell junctions would enhance the function of an epithelial tissue whose main function is absorption?

A. Cilia

B. Microvilli

C. Villi

D. Cytokeratin

25. Which of the following cell junctions provide attachments for tonofilaments?

A. Desmosome (Macula adherens)

B. Intermmediate

C. Nexus

D. Tight junctions

26.What is the reason for the fact that fibrocartilage unlike hyaline cartilage only grows interstially?

A. Lack of fibroblast on its periphery

B.Lack of perichondrium

C.Possession of a very thin perichondrium

D. Avascularity

27.Which muscle cell is capable of hyperplasia as well as hypertrophy?

A. Cardiac muscle

B. Skeletal

C. Smooth

D.Both A and C

28.Growth in cartilage tissue by proliferation of chondrocytes that differentiate from fibroblasts is known as

A. Interstitial Growth

B. Appositional Growth

C. General Growth

D. Tissue Growth

29.Which is the feature exclusive to cardiomyocytes?

A. A single nucleus

B. Centrally located nucleus

C. Cross striations

D. Intercalated discs

30.Which of the following is not a reason for fixing tissues during histological processing?

A. To prevent digestion by enzymes (autolysis)

B. To preserve physical structure

C. To create contrast for distinguishing components

D. To prevent post mortem decomposition

30. In which muscle types are nuclei centrally located within the muscle.

A. Cardiac, smooth and skeletal

B. Cardiac and Smooth

C. Smooth and skeletal

D. Cardiac and Skeletal

31. The intermmediate junction is the common name for which of the following?

A Macula adherens

B. **Zonula adherens**

C.Zonula occludens

D.Fascia adherens

32. Under the electron microscope cardiac muscle can be distinguished from its skeletal counterparts by which of the following features?

A. Diads at the level of the junction between A and I bands

B. Diads at the level of the Z- bands

C. Mitochondria

D. Triads at the level of the Z band

E. A and D only

33. What is the main purpose of bone remodelling?

A. Increase in girth of long bones

B. Increase thickness of bone

C. Meet the stress placed on it

D. Make it stronger but not flexible

E. A and B only

34. Which of the following is a feature common to both epithelia and cartilage?

A. Ability to regenerate

B. Polarity of constituent cells

C. Absence of blood vessels

D. To prevent post mortem decomposition

35. Which of the following diseases is influenced by excessive osteoclatic activity.

A. Scurvy

B. Osteomalacia

C. Osteoporosis

D. Rickets

E. Acromegaly

36 Bone and cartilage tissues have all the following in common except

A. Hydroxyapatite crystals

B. Sulfated GAGs

C. Hyaluronic acid

D. Lacunae

E. Glycoproteins

37 Which of the following is the reasoning for staining tissue during histological processing?

A. To prevent digestion by enzymes

B. To preserve normal organization pattern of components

C To create contrast for distinguishing components

D To prevent post mortem decomposition

38. The nose and the ear are the most pierced parts of the body. Which of the following explains why they are easier to pierce and the hole made does not close?

A. They contain cartilage which is avascular and so does not bleed when pierced

B. They have a core of cartilage which is devoid of nerves and so piercing it does not cause pain.

C. Cartilage regeneration is usually poor

D. All the Above

39 Which glands are simple coiled tubular?

A. Sweat glands

B. Colonic glands

C. Penile uretheral glands

D. Sebaceous glands

40. Which type of glands has a mode of secretion in which the entire cell is shed to release the secretory vesicles?

A. Apocrine

B. Eccrine

C. Holocrine

D Merocrine

41. Which of the following connective tissue cells play a a key role in allergic response?

A.Mast cells

B.Macrophages

C.Fibroblasts

D.Adipocytes

42. Which band in the registered arrangement of myofilaments in striated muscle is bisected by the Z-disc?

A. A-band

B. H-band

C. I-band

D. M-band

43. From which of the following would bleeding occur on account of damaged vessels when skeletal muscle is cut?

A. Endomysium

B. Perimysium

C. Epimysium

D. All of the above

44. Which cartilage lacks a perichondrium?

A. Fibrocartilage

B. Elastic Cartilage

C.Hyaline Cartilage

D.None of the above

45. Which component of bone matrix is most responsible for its ability to undergo mineralization?

A. Specific structural glycoproteins

B. Collagenous structural glycoproteins

C. Type II Collagen fibres

D. Type I Collagen fibres

46. Which of the following forms the inorganic component of bone tissue that exists as hydroxyapatite crystals?

A. Magnesium and Potasssium

B. Bicarbonate and Citrate

C. Calcium and Potassium

D. Calcium and Phosphorus

47. Bundles of periosteal collagen fibres that penetrate bone matrix binding the periosteum to bone is known as **Sharpey's fibres**

48 Cartilage matrix that is rich in GAG's and poor in collagen and surrounds lacunae is called **Territorial Matrix**

49 Growth in cartilage tissue by proliferation of chondrocytes that differenciate from fibroblasts is known as **Interstitial Growth**

Kwaku was knocked down by a taxi when he tried to cross a busy street. An X-ray of his hurting leg showed a simple fracture of the tibia which was subsequently immobilized in Plaster of Paris (POP) to facilitate healing of the bone fracture.

50 Name the cell that will be responsible for laying down new bone tissue.

Osteoblast

51 What would the newly formed bone be called? **Woven Bone**

52 What cell will be reponsible for resorption of the bone during remodelling?

Osteoclast

53 Name the microscopic unit of a remodelled bone? **Osteon**

54 Name two hormones which affect remodelling of bone. Parathormine and Calcitonin

55 Which of the following serves as model for long bone development in fetus.

Cartilage

56 Serous acini differs from mucous acinar by which of the following features:

A. Rounded nucleus

B. Cytoplasm stains pink with H&E stain

C. Large Golgi body

D. Very little Endoplasmic reticulum

E. A and B only

57 Reticular fibres are best demonstrated by which of the following stains listed below?

A. Periodic Acid- Shiff Reaction (PAS)

B. Mallory trichrome stain

C. Alcian blue

D. Iron haematoxylin

E. Silver stain (Agyrophilic)

58 Tight junction is the common name for which of the following

A. Zonula adherens

B. Zonula occludens

C. Macula adherens

D. Fascia occludens

E. Nexus

59. Which of the following cells are the direct generative cells that produce extracellular matrix in cartilage?

a) Fibroblasts

b **Chondroblasts**

c) Chondrocytes

d) Chondroclast

e) Chondrogenic

60 In addition to elastic fibres which of the following collagen fibres is abundant in elastic cartilage? a) Type I b) **Type II** c) Type III d) Type IV e) Types II and IV

61) Bone is dynamic. It is always being reformed to withstand the changing stresses on it. Which bone cells are involved in this process?

a) Osteoclasts b) Osteoblasts c) Osteocytes d) A, B and C **e) A and B only**

62 People diagnosed as suffering from achondroplasia have short stature. This condition results from defective ossification at the epiphyseal plate of long bone during fetal life. Which of the following cells is affected

a) Osteoblast

b) b) Osteocyte

c) **c) Chondroblast**

d) d) Chondrocyte

e) e) Osteoprogenitor

63. Both skeletal and cardiac muscles are types of striated muscle. Under the light microscope, however, one can tell them apart by which of the following characteristics?
a) Location of the nuclei
b) Number of nuclei per cell
c) Junctional complexes
d) All of the above
e) None of the above

64 Which is the reason why smooth muscle cell, unlike its cardiac counterparts is unstriated? Because:
a) It lacks many of the filaments found in cardiac muscle
b) Its myofilaments are not regularly arranged
c) It has more sarcoplasm so the striations are not prominent
d) Z-bands are prominent
e) Myosin filaments are attached to the sarcolemma

65.Which of the following hormones inhibit bone resorption?
a) Active vitamin D
b) Calcitonin
c) Thyroid hormone
d) Parathyroid hormone
e) Tumor necrosis factor B

66.During the development of most long bones, the periosteal bud comprising ostropogenitor, hemopoietic cells and blood vessels enter large spaces (lacunae) left by dead chondrocytes Which of the following cells facilitate their invasion?

A. Osteoblasts

B. Osteocytes in the body collar

C. Osteoclasts

D. Secretions from mesenchymal cells

E. Fibroblasts from periosteum

67.Which is the correct hierarchy of arrangement in skeletal muscle from the smallest to the largest unit?
a) Myofilament<myofibril<myofibre<muscle fascicle<entire muscle
b) Myofibril<myofilament<muscle fascicle<myofibre<entire muscle
c) Myofilament<myofibre<myofibril<muscle fascicle<entire muscle
d) Myofibre<myofibril<myofilament<muscle fascicle<entire muscle
e) Muscle fascicle, myofilament, myofibre<myofibril, entire muscle

68. Tendon is classified as which of the following types of connective tissue?

A. Loose (areolar)

B. Reticular

C. Dense-irregular

D. Dense regular

69. Which extracellular component of connective tissue has a definite microscopic structure?

A. Proteoglycans

B. Fibres

C. Glycosaminoglycans

D. Non collagenous structural proteins

70. Which connective tissue fibres are agyrophilic?

A. Collagen type I

B. Collage Type II

C. Elastic fibres

D. **Reticular fibres**

71. One charecteristic of transitional epithelium is is that the surface cells

A. Have extremely thin plasma membrane

B. Are larger than those below

C. Are smaller than those below'

D. Are usually polyploid

72. Striated muscle is found in all of the following except

A. Trachea

B. Tongue

C. Oesophagus

D. Lip

73. The following statements are true of connective tissues **EXCEPT:**

A. A large intercellular space

B. Amorphous intercellular substance

C. Different cell types

D. Many nucleated cells

E. Tissue fluid

74. Some microorganisms are able to invade connective tissue rapidly because they synthetize which of the following enzymes?

A. Hyaluronidase

B. Carboxypeptidase

C. Lipase

D. Protease

E. Ribonuclease

75. A characteristic of pseudostratified columnar epithelium with stereocilia is that all cells:

A. Are connected by gap junctions

B. Are in contact with their basement membrane

C. Have a free surface

D. Have highly folded basement membranes

E. Have their nuclei at the same level

76. Which is the principal function of a stratified squamous epithelium?

A. Absorption

B. Excretion

C. Protection

D. Secretion

E. Support

77. Which of the following is classified as a compound gland?

A. One with a duct that drains several acini

B. One with a single duct that drains more than one secretory unit

C. One which has a branching duct system

D. One which has two ducts that drain acini

E. One which has more than two ducts that drain several acini

78. Which two key instruments whose inventions were central to the development of histology as an anatomical discipline?

A. Dyes or stains

B. Microscope

C. Microtome

D. A and B

E. B and C

79. In humans, the stem cell which is capable of giving rise to all cell types during the formation of the embryo is described as being:

A. Multipotent

B. Pluripotent

C. Precursor

D. Progenitor

E. Totipotent

80. Why is it necessary to clear tissue blocks before embedding in wax during tissue processing?

A. Tissue blocks must be clearly visible in embedding medium

B. Tissue blocks are easier to embed after clearing

C. To remove dehydrating agent

D. To put tissue in a solvent that is miscible with molten wax

E. To prevent further shrinkage of tissue blocks

81. Which connective tissue cell exhibits metachromasia?

A. Adipocyte

B. Basophil

C. Macrophage

D. Mast cell

E. Monocyte

82. If a cancer patient is given an anti-mitotic drug as part of the clinical management, which of the features of the patient's epithelial tissues will be most directly affected?

A. Integrity of the basement membrane

B. Integrins (transmembrane proteins)

C. Polarity of the cell

D. Specialised contacts

E. Regenerative capacity

83. A connexon is the unit of which type of specialized intercellular contact between epithelial cells?

A. Adherent junction

B. Desmosomal junction

C. Gap junction

D. Intermediate junction

E. Occluding junction

84. A closing door of a bedroom smashed the fingers of sic-year old Kofi who suffered a fracture in two phalanges. Which one of the following statements is true concerning the healing of the fractured bones?

A. Bone repair will occur directly from the mesenchyme

B. Osteoclasts will not play any role in bone repair

C. The first bone produced during repair would be the woven type

D. There would be no bleeding because bone tissue is avascular

E. There would be a bony collar to breach the broken ends of the phalanx first

85. Muscular dystrophy is characterised by weakness and wasting of skeletal muscle. What is/are the possible causes(s) of this condition?

A. Absence of external lamina

B. Incompetent sets of myofilaments

C. Muscle cells die and are replaced by connective tissue

D. Defective link protein involved in muscular function

E. Lack of neuromuscular junction

86. Which is the commonest fixative used in routine histological processing of tissues?

A. Alcohol

B. Formalin

C. Formic acid

D. Gluteraldehyde

E. Xylene

87. Which band in the registered arrangement of myofilaments is striated muscle containing only actin filaments?

A. A- band

B. H-band

C. I-band

D. H-band

E. M-band

88. Which of the underlisted cells is reponsible for the resorption of bone?

A. Chondroclast

B. Osteoblast

C. Osteoclast

D. Osteocyte

E. Osteoprogenitor

89. Which component of bone tissue is responsible for its ability to undergo mineralisation (calcification)?

A. Specific proteoglycan

B. Specific structural glycoproteins (osteocalcin)

C. Type I collagen fibres

D. Type II Collagen fibres

E. Type III Collagen fibres

90. Which of the following statements is not true of endochondral ossification?

A. Osteoblasts differentiate directly from mesenchymal cells

B. Osteoprogenitor cells form collar bone

C. Chondrocytes enlarge, degenerate and leave large lacunae

D. Osreoblasts lay new bone on cartilage template

E. Osteoclasts resorb bony matrix

91. Which is the reason why cartilage cannot grow very thick?

A. Chondrocytes do not divide much

B. It is avascular thus Oxygen and nutrients must diffuse through the water of hydration in the matrix which is inefficient

C. Some of the cells are not well nourished

D. All of the above

E. None of the above

92. Which is/are the reason(s) for the faster growth in height of males at puberty compared with females of similar age?

A. Post-pubertal hormone estradiol slows down synthesis of Glycosaminoglycans in cartilage

B. Post-pubertal male hormone testosterone promotes synthesis of glycosaminoglycans in cartilage

C. There is drastic reduction of chondrocytes in the postpubertal female

D. A and B

E. A and C