Chapter: 16

Support and Movements

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MCQs

1 Bark is made up of:
- (A) Cork , cork cambium cortex & phloem
- (B) Wood , pith and Xylem
- (C) Xylem , phloem and cortex
- **(D) Cork , cork cambium , pith and phloem**

2 In older trees , the active portion of the trunk is:
- (A) Heart wood
- (B) Black wood
- (C) Annual growth
- **(D) Sap wood**

3 An increase in plant due to the activity of vascular cambium is called:
- (A) Primary growth
- **(B) Secondary grow**
- (C) Open growth
- (D) Tertiary growth

4 Cambium is an example of:
- (A) Apical meristem
- (B) meristem
- **(C) Lateral meristem**
- (D) Apex

5 Fibers, sclereides and vessels are three types of:
- (A) Collenchyma
- (B) Cambium
- (C) Parenchyma
- **(D) Sclerenchyma**

6 The group of cells usually lack secondary wall and have angular thickenings is:
- (A) Sclerenchyma
- (B) Fibers
- **(C) Collenchyma**
- (D) Vessels

7 The inactive non-conduction wood is called:
- (A) Pholem
- (B) Xylem
- **(C) Heart wood**
- (D) Sapwood

8 This type of wood is most resistant to decay and insect attack.
- (A) Callus
- **(B) Heart wood**
- (C) Hard wood
- (D) Sapwood

9 The collenchyma cells have protoplast and usually lack:
- (A) Secondary wall
- (B) Primary wall
- (C) Cell membrane
- **(D) Vacoule**

10 The sclerenchyma cells found in seed coats and nut shell are the:
- (A) Vessels
- **(B) Fibers**
- (C) Trachieds
- (D) Sclerieds

11 In plants , Turgor pressure is generated by high osmotic pressure of the:
- (A) Cytoplasm
- (B) Mitochondria
- **(C) Vacuole**
- (D) Chloroplast

12 The loss of water due to ex-osmosis from plant cells causes plant to:
- (A) Turgid
- (B) Swell
- (C) Rupture
- **(D) Wilt**

13 Which of the following cells have angular thickenings in their primary walls?
- (A) Vessels
- (B) Sclerenchyma
- (C) Fibers
- **(D) Collenchyma**

14 Bundle caps in sunflower stem , are formed by:
- (A) Collenchyma
- (B) Mesenchyma
- **(C) Sclerenchyma**
- (D) Parenchyma

15 The cell wall of sclerenchymatous cells are usually impregnated with:
- (A) Cutin
- **(B) Lignin**
- (C) Pentin
- (D) Suberin

16 The collenchyma and sclerechyma are heavily lignified cells respectively present in:
- (A) Cotex and phloem
- (B) Xylem and phloem
- (C) Pericycle and cortex
- **(D) Cortex and xylem**

17 Turgor pressure is generated by osmotic pressure of:
(A) Cell vacuole (B) Cell cytosol (C) Cytoplast (D) Protoplast

18 The membrane that bounds vacuole is called:
(A) Primary cell **(B) Tonoplast** (C) Vascular wall (D) Pelicle

19 Angular thickening in their primary wall in present in:
(A) Parenchyma (B) Sclernchyma **(C) Collenchyma** (D) Tracheids

20 The process of moulting is controlled by the nervous system and a hormone is:
(A) Aldosteron (B) Androgen **(C) Ecdysone** (D) Oxytocin

21 All the changes of molting are controlled by the nervous system and the hormone.
(A) Serotonin (B) Epinephrine (C) Melanin **(D) Ecdysone**

22 The collagen of fiber of a bone are hardened by the deposition of:
(A) Calcium phosphate (B) Calcium oxalate
(C) Calcium carbonate **(D) Osteoclasts**

23 The living cells of cartilage are called:
(A) Osteoblasts (B) Osteocytes (C) Osteoclasts **(D) Chondrocytes**

24 Which bone provide attachment site for muscles?
(A) Spongy bone **(B) Compact bone** (C) Soft bone (D) Cartilage

25 Bone forming cells are known as:
(A) Chondroblasts (B) Osteoclasts **(C) Osteoblasts** (D) Osteocycles

26 Number of thoracic vertebrae in the thoracic region is:
(A) 8 vertebrae (B) 10 vertebrae (C) 14 vertebrae **(D) 12 vertebrae**

27 The axial skeleton includes:
(A) Limbs (B) Pectoral girdle (C) Pelvic girdle **(D) Vertebrae**

28 The fusion of four posterior vertebrae present in pelvic region form:
(A) Cervical (B) Sacrum (C) Lumber **(D) Coccyx**

29 The vertebral column of human consist of vertebrae:
(A) 31 (B) 32 (C) 34 **(D) 33**

30 A bone which connects scapula with sternum:
(A) Humerus (B) Ischium **(C) Clavicle** (D) Pubis

31 Femur , tibia and fibula are the bones of:
(A) Neck (B) Skull **(C) Hind limb** (D) Fore limb

32 The number of cervical vertebrae is:
(A) 22 (B) 33 **(C) 7** (D) 12

33 Seven vertebrae which lie in the neck region are called:
(A) Pelvic vertebrae (B) Thoracic vertebrae
(C) Cervical vertebrae **(D) Lumbar vertebrae**

34 Which of the following is a bone of axial skeleton:

(A) Humerus (B) Femur (C) Tibia **(D) Rib**

35 The number of pelvic vertebrae in vertebral column of man is:
(A) 5 **(B) 9** (C) 7 (D) 12

36 Fibrous joint are formed in:
(A) Leg **(B) Skull** (C) Arm (D) Chest

37 Joints that are held together by short fibers embedded in connective tissue:
(A) Synovial joints **(B) Fibrous joints** (C) Cartilaginous joints (D) Hinge joints

38 The joint that allow the movements in two directions:
(A) Ball and socket joint (B) Synovial joints
(C) Cervical vertebrae **(D) Hinge joints**

39 The synovial joint is surrounded by a layer of connective tissue called:
(A) Hyaline cartilage **(B) Fibrous capsule** (C) Annulus fibrosus (D) Hematoma

40 The disease which cause immobility and fusion of vertebral joints is called:
(A) Sciatica **(B) Spondylosis** (C) Arthritis (D) Rickets

41 In microcephaly , the individuals are born with small:
(A) Eyes **(B) Skull** (C) Hands (D) Legs

42 Rickets is caused by deficiency of:
(A) Vitamin A (B) Vitamin B **(C) Vitamin D** (D) Vitamin C

43 A disease caused by low calcium in the blood is called:
(A) Cramp (B) Paralysis (C) Tetanus **(D) Tetany**

44 Rickets in children results in bowed legs and deformed:
(A) Head (B) Pectoral girdle (C) Chest **(D) Pelvis**

45 A condition in which palatine processed of maxilla and palatine fail to fuse is called:
(A) Microcephally **(B) Cleft palate** (C) Cretinism (D) Myxedema

46 Acute forms of arthritis usually result from:
(A) Viral invasion **(B) Bacterial invasion** (C) Severe injury (D) Fungal invasion

47 Sciatica is characterized by stabbing pain radiating over the course of:
(A) Sciatic artery (B) Sciatic capillary (C) Sciatic vein **(D) Sciatic nerve**

48 Which one is not a joint disease?
(A) Arthritis **(B) Sciatica** (C) Disc slips (D) Spondylosis

49 Bowed legs and deformed pelvis are the symptoms of which disease in children?
(A) Haematoma (B) Sciatica **(C) Rickets** (D) Disc slip

50 What is mortality rate in developing countries due to tetanus?
(A) 35 % (B) 45 % (C) 50 % **(D) 40 %**

51 Muscles are attached to bones with a bundle of collagen called tendons that is .....in nature.
(A) Elastic (B) Fluid **(C) Non- elastic** (D) Semi fluid

52 Tetanus is caused by:
(A) Protists (B) Fungi **(C) Bacteria** (D) Virus

53 Cramp is also known as:
(A) Tetany **(B) Tetanic contraction** (C) Tetanus (D) Muscle fatigue

54 Muscle fatigue is caused by accumulation of:
(A) Fumaric acid (B) Alcohol (C) CO_2 **(D) Lactic acid**

55 Complete immobilization of muscle leads to:
(A) Increase in capillaries (B) Increase in mitocondria
(C) Resistance to fatigue **(D) Severe atrophy**

56 The skeletal muscles are attached with the bones through the:
(A) Ligament **(B) Tendons** (C) Sarcolemma (D) Myofibrils

57 Slightly elastic connective tissue that attach bone to bone are called:
(A) Tendons (B) Brachialis **(C) Ligament** (D) Brachioradialis

58 Thick filament in myofibril is made up of:
(A) Actin (B) Tropomyosin (C) Tropoin **(D) Myosin**

59 Opening of flower bud follows:
(A) Photonasty (B) Hyponasty (C) Haptonasty **(D) Epinasty**

60 Skeletal muscles are called striated (stripped) because of presence of:
(A) Red and Yellow bands (B) White and Yellow bands
(C) Red and Black bands **(D) Alternating dark and light bands**

61 Skeletal muscle fibres have diameter:
(A) 100 - 200 µm (B) 10 - 100 µm **(C) 0 - 10 µm** (D) 100 - 1000 µm

62 Tetanus is caused by:
(A) Virus **(B) Bacteria** (C) Fungi (D) Protist

63 The diameter of skeletal muscle fibres is:
(A) 10 - 100 µm (B) 10 - 80 µm (C) 10 - 120 µm (D) 10 - 135 µm

64 Which end of the muslce remains fixed when the muscle contracts?
(A) Insertion **(B) Origin** (C) Tendon (D) Belly

65 Which of the following muscle straightens the elbow joint?
(A) Brachialis (B) Biceps **(C) Traiceps** (D) Brachioradialis

66 In birds , the sternum is modified to form:
(A) Rib (B) Neck **(C) Keel** (D) Clavicle

67 Proteins that bind to calcium in muscle contraction:
(A) Actin (B) Myosin **(C) Troponin** (D) Tropomyosin

68 The joint that allow movement in two directions only:
(A) Cartilaginous joints (B) Ball & socket joint
(C) Fibrous joint **(D) Hinge joint**

69 Osteomalacia includes a number of disorders in which bones receive inadequate.
(A) Water **(B) Minerals** (C) Oxygen (D) Blood

70 Each A-band has a lighter stripe in its mid-section called:
(A) A - Zone (B) Z - Line (C) M - Line **(D) H - Zone**

71 The inflammatory degenerative disease of joint is:
(A) Herniation **(B) Arthritis** (C) Sciatica (D) Spondylosis

72 The cell found in seed coats and nut shells are:
(A) Fibers **(B) Sclereides** (C) Vessels (D) Trachea

73 The collenchymatous cells are highly lignified and found in the:
(A) Epidermis (B) Pith **(C) Cortex** (D) Xylem

74 Tetany is a disease caused by:
(A) Low vit. D in blood (B) Low sugar in blood
(C) High calcium in blood **(D) Low calcium in blood**

75 The structure which respond are called:
(A) ATP (B) Creatine phosphate (C) Lactic acid (D) Both C & B

76 When muscle contracts:
(A) Actin slides past over myosin (B) Both A & C
(C) Sacromere increases in size (D) Lictic acid is produced

77 Which of the following changes occur when skeletal muscles contracts:
(A) The I band shorten (B) The actin filament contract
(C) The Z line slide farther a part (D) The A band shorten

78 Thin filament in myofibrils consist of:
(A) Z-line (B) Myosin
(C) Sarcomere **(D) Actin , tropomyosin , troponin**

79 The contraction of striated muscle is initiated by the release of energy in the presence of
(A) Acetylcholine (B) Iron **(C) Calcium ion** (D) Chloride ion

80 In the mammalian skeleton there in a distinct synovial joint between the:
(A) Bones of the cranium (B) Sternum and floating ribs
(C) Sacrum of ilium **(D) Humerus and ulna**

81 Which of the following is a bone of axial skeleton?
(A) Femur (B) Pelvis **(C) Rib** (D) Shoulder girdle

82 Vertebral column includes:
(A) Sacrum (B) Cervical , thoracic & lumber vertebrae
(C) The coccyx **(D) All of above**

83 In mammals the number of cervical vertebrae are:
(A) No definite number (B) Eleven
(C) Varies with the size of neck **(D) Seven**

84 Brain is protected by:

(A) Cranium (B) Skull (C) Orbits (D) All of these

85 Which of the following is plantigrade?
(A) Dendrites (B) Monkeys (C) Horse (D) Carnivors

86 Brachioradialis causes the uplift of:
(A) Humerus (B) Ulna (C) Radius (D) Both C & B

87 Moulting occurs in arthropod at the:
(A) Immature stage (B) Both stages
(C) Mature stage (D) Do not undergo molting

88 Muscle fatigue is caused by:
(A) Accumulation of lactic acid (B) Fumaric acid
(C) CO_2 (D) EthyI alcohol

89 Cardiac muscles are:
(A) Voluntary (B) None of these (C) Both A & D (D) Involuntary

90 The movement in response to stimulus of touch i.e. Climbing vines is called:
(A) Hydrotropism (B) Geotropism (C) Phototropism (D) Thigmotropism

91 In plants movement in response to stimulus of touch is called:
(A) Phototactie (B) Chemotactic (C) Thigmotropism (D) Nyctinasty

92 The sleep movements of plants fall under the category of:
(A) Growth (B) Turgor (C) Tactic (D) Tropic

93 Haptonastic movements occur in response to:
(A) Contact (B) Chemica (C) Temperature (D) Water

94 The word tropic is derived from Greek word "Tropos" meaning.
(A) Sticky (B) Turn (C) Attractive (D) Growth

95 Positive gravitropism of root is due to:
(A) Ethene (B) Abscisic acid (C) Auxin (D) Gibberellin

96 Action of the Venus fly trap is:
(A) Nyctinasty (B) Photonasty (C) Haptonasty (D) Thermonasty

97 The hyphase of fungi are:
(A) Phototactic (B) Chemotactic (C) Geotropic (D) Chemotropic

98 Movement shown by sperms of liver worts, mosses, forns towards archegonia is a:
(A) Chemotactic movement (B) Phototropic movement
(C) Photoactic movement (D) Chemotropic movement

99 Thy type of nastic movement , which occurs in response to contact is called:
(A) Nyctinasty (B) Thermonasty (C) Photonasty (D) Haptonastic

100 Hyponasty is caused by:
(A) Auxin (B) Cytokinins (C) Abscisic acid (D) Gibberellins

Fill in the blanks.

1. Each muscle is enclosed by a membrane known as ……. .
2. Osteoporois in caused by the decrease in the level of …… .
3. The “molting” is controlled by a hormone …… .
4. …….. is stored in the muscle cell as reserve food.
5. Collenchymatous cells lack …… in their primary wall.
6. There are …… vertebrae in the neck region of mammals.
7. The most abundant proteins in the muscle are …….. .
8. ……. connect a muscle to a bone.
9. Thick muscle filament is composed of …… .

Answers

1.	**Sarcolemma**	2.	**Estrogen**	3.	**Ecdysone**
4.	**Glycogen**	5.	**ligin**	6.	**Seven**
7.	**Actin**	8.	**Tendon**	9.	**Myosin Psoteins**

Chapter : 16

Support and Movements

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Short Questions Answers

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1. **What does growth ring indicates?**

Ans: Since one growth ring is formed in one year, a count of the rings at the base of trunk indicates the age of trees at the time it was cut.

2. **What is the function of heart wood?**

Ans: In most species the heartwood accumulates a variety of chemicals such as resins, oils, gums and tannins. These provide a resistance to decay and insect attack for example in red cedar and conifers.

3. **What are sleep movements?**

Ans: Bean plants and some members of legume family lower their leaves in the evening and raise them in the morning. These are **known** as sleep movements.

4. **What is Nyctinasty?**

Ans: The nyctinastic movements are shown by the organs in response to external stimuli leading to differential growth. These are due to turgor and growth changes.

5. **What is cartilage?**

Ans: Cartilage is much softer than bone. It is a form of connective tissue. It covers ends of the bone at the joint, and also supports the flexible portion of nose and external ears. No blood vessels penetrate into cartilage.

6. **In how many categories joints are classified? Name them.**

Ans: Joints are classified on the basis of the amount of movements allowed by them, into three categories:

- ❖ Immovable joints.
- ❖ Slightly movable joints.
- ❖ Freely movable joints.

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7. **What is sciatica?**

Ans: It is characterized by stabbing pain radiating over the course of sciatic nerve results due to injury of proximal sciatic nerve, which might follow a fall, a herniated disc or improper administration of an injection into the buttock.

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8. **How many steps are involved in repairing of broken bones? Name them.**

Ans: The repair process of a simple fracture takes place in four phases:

- ❖ Haematoma formation.
- ❖ Callus formation.
- ❖ Bony callus formation.
- ❖ Remodelling.

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9. **Why heart muscles are known as cardiac muscles?**

Ans: Cardiac muscles are actually the muscles of heart. They constitute most of the mass of the heart walls. These muscles are also striated and involuntary. Therefore, heart muscles are **known** as cardiac muscles.

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10. **What are digitigrades?**

Ans: The mammals which tend to walk on their digits only are **called** digitigrades. They run faster than plantigrade animals **e.g.,** rabbit, rodents etc.

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11. **What are cross bridges?**

Ans: The heads of myosin are **called** cross bridges which make links with actin during muscles contraction.

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12. **What do you understand from "Rigor Mortis"?**

Ans: After death, the amount of **ATP** in the body falls, under these circumstances the bridges cannot be broken and so they remain firmly bound. This results in the body becoming stiff, a condition **known** as Rigor Mortis.

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13. **Define sacromere.**

Ans: A sacromere is the region of a myofibril between two successive Z-lines and is the smallest contractile unit of muscle fibre.

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14. **What are chondrocytes?**

Ans: The living cells of cartilage are called chondrocytes. These cells secrete flexible, elastic, non-living matrix collagen that surrounds the chondrocytes.

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15. **What is spondylosis?**

Ans: It is the disease, which causes immobility and fusion of vertebral joint.

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16. **What is hydro-skeleton or hydro-static skeleton?**

Ans: Animals may have a fluid filled gastrovascular cavity or coelom which can act as hydro-skeleton or hydro-static skeleton. Hydro-static skeleton provides support and resistance to the contraction of muscles so that motility results.

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17. **What is the hyaline cartilage?**

Ans: It is the most abundant type of cartilage in human body. It is found at the movable joints.

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18. **What provides support in plants and animals?**

Ans: The collenchymatous cells in plants give support to the baby plants and sclerenchymatous cells to the adult plants. In animals muscles, cartilage and bones provide support.

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19. **What is turgor pressure?**

Ans: The living cells of epidermis, cortex and pith take in water by osmosis. An internal hydrostatic pressure **called** turgor pressure develops which keeps them rigid, resistant to bending and maintain the turgidity.

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20. **What is Bundle cap?**

Ans: In the stem of some plants, for **example**, sunflower, the vascular bundles are strengthened by additional sclerenchyma fibers, which form bundle cap.

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21. **What is tonoplast?**

Ans: The membrane that bounds vacuole is **called** tonoplast which contains a number of active transport systems that pump ions into the vacuoles.

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22. **What are fibers or tracheids?**

Ans: These are long and cylindrical and they may exist in solid bundles in xylem or as bundle caps.

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23. **Wha are sclereids?**

Ans: These are shorter than fibers and are found in seed coats and nutshells and provide protection.

---

24. **What are vessels or trachea?**

Ans: Long tubular structures, join end to end to form long water conducting pipe in xylem.

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25. **Define secondary growth?**

Ans: Growth due to lateral meristem or cambium is **called** secondary growth.

Or

An increase in plant growth due to the activity of vascular cambium is **called** secondary growth.

The result of secondary growth is most evident in woody, perennial plants like trees, shrubs and vine.

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26. **Which meristems are involved in secondary growth?**

Ans: **Secondary growth occurs due to cell division in:**

- ❖ Vascular cambium.
- ❖ Cork cambium.

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27. **What is sapwood and heartwood?**

Ans: As trees grow older only few annual growth rings are active in conduction at one time. The active portion is **called** sapwood. The inactive non-conducting wood is **called heartwood**.

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28. **What is callus or wood tissue?**

Ans: An important function of the cambium is to form callus or wood tissue on or over the

wound. Soft parenchymatous tissues are rapidly formed on or below the damaged surface of stems and roots. The callus unites the branches during budding and grafting.

29. **What is difference between animal and plant movements?**

Ans: Animals move in response to external stimuli by motion, similarly plants also show movements. Animals **change** their location in response to stimulus. **Plants** are fixed therefore they **change** their growth pattern.

30. **What are main types of movements in plants?**

Ans: There are two types of movements:

- ❖ Autonomic movements.
- ❖ Growth movements.

31. **What are autonomic movements? Also give their main types.**

Ans: Autonomic movements are spontaneous movements due to internal causes. Autonomic movements are of three types:

- ❖ Tactic movements.
- ❖ Turgor movements.
- ❖ Growth movements.

32. **Define tactic movements.**

Ans: These are the movements of an entire cell or organism i.e. locomotion due to external stimulus. The tactic movements may be positive if it is towards the stimulus or negative if it is away from the stimulus.

33. **What is phototactic movement?**

Ans: It is a movement in response to stimulus of light. The best example of positive tactic movements is the passive movements of chloroplast due to cyclosis. This movement helps the chloroplast to absorb maximum light for CO_2 fixation.

34. **What is chemotactic movement?**

Ans: The movements in response to stimulus of chemicals are **called** chemotactic movements. The movements shown by sperms of liver-worts, mosses, ferns towards archegonia in response to stimulus of nucleic acid released by the ovum are such examples.

35. **What is turgor movements?**

Ans: Turgor movements is due to differential changes in turgor and size of **cells** a result of gain or loss of water. Rapid movements of leaflets in “touch me not" plant and sleep movements of the plants fall under this category of movements.

36. **What are growth movements?**

Ans: Growth movements are due to unequal growth on two sides of plants organs like stem, root, tendrils, buds etc.

37. **Define epinasty.**

Ans: It is shown by leaves, petals etc. The upper surface of leaf in bud condition shows more growth as compared with the lower surface. This leads to opening of buds.

38. **Define hyponasty.**

Ans: If growth in the lower surface of the leaf in bud condition is more than that of the upper surface than the bud will remain closed.

39. **Define nutation.**

Ans: The growing tip of young stem moves in zig zag fashion due to alternate changes in growth on opposite side of the apex. This mode of growth is **called** nutation.

40. **What are tropic movements?**

Ans: It is the movement in curvature of whole organ towards or away from stimuli such as light, gravity and touch.

41. **Define phototropism.**

Ans: It is the movement of part of the plant in response to stimulus of light and is caused due to differential growth of a plant part like stem or root.

42. **Define thigmotropism.**

Ans: It is the movement in response to stimulus of touch, for **example** climbing vines. When they come in contact with some solid object, the growth on the opposite side of contact increases and the tendril coils around the support.

43. **Define chemotropism.**

Ans: The movement in response to some chemicals is **called** chemotropism. The hyphae of fungi are chemotropic.

44. **Define hydrotropism.**

Ans: The movement of plant parts in response to stimulus of water is **called** hydrotropism. Roots show positive hydrotropism and shoots show negative hydrotropism.

45. **Define geotropism or gravitropism.**

Ans: It is the response to gravity. Roots display positive geotropism and shoots show negative geotropism.

46. **What are nastic movements?**

Ans: These are the non-directional movements of parts of plant in response to external stimuli.

47. **Define photonasty.**

Ans: The principal stimulus is the photoperiod. Flowers open and close due to light sensitivity.

48. **Define thermonasty.**

Ans: It is due to temperature. The flowers of tulip close at night because of rapid growth in the lower side by upward and inward bending of the petals.

49. **Define haptonastic movements?**

Ans: It occurs in response to contact e.g., the action of the Venus fly trap.

50. **What is skeleton?**

Ans: The skeleton is tough and rigid framework of the body of animals which provides protection, shape and support to the body organs.

51. **What are different types of skeleton?**

Ans: There are three main types of skeleton in animals:

- Hydrostatic Skeleton.
- Exoskeleton.
- Endoskeleton.

52. **Define exoskeleton.**

Ans: An exoskeleton is hardened outer surface to which internal muscles can be attached.

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53. **What is the composition of of exoskeleton?**

Ans: It is composed of two layers. The epicuticle is the outermost layer and is made up of waxy lipoprotein. The bulb of exoskeleton is below the epicuticle and is **called** procuticle which is composed of chitin, tough, leathery, polysaccharide and several kinds of proteins.

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54. **What is moulting or ecdysis?**

Ans: When arthropods have to grow they need to shed exoskeleton periodically and replace it with one of the larger size. This process is **known** as Ecdysis or moulting.

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55. **What is endoskeleton?**

Ans: The skeleton that lies internally to the muscles is **called** endoskeleton. It provides support, shape, protection and locomotion.

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56. **What is the composition of endoskeleton?**

Ans: The endoskeleton is primarily made up of two types of tissues.

- ❖ Bones.
- ❖ Cartilage.

Both bones and cartilage are types of rigid connective tissue. Both consist of living cells embedded in the matrix of protein called collagen.

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57. **What do you know about compact bone?**

Ans: Compact bone is dense and strong and provides an attachment site for muscle.

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58. **What are the characteristics of spongy bone?**

Ans: Spongy bone is light,rich in blood vessels, and highly porous. The cavities of spongy bone contain bone marrow where blood cells are formed.

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59. **Name the cells associated with bone?**

Ans: **There are three types of cells associated with bone:**

- ❖ Bone forming cells (Osteoblasts).
- ❖ Mature bone cells (Osteocytes).
- ❖ Bone dissolving cells (Osteoclasts).

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60. **What is fibro cartilage?**

Ans: It has matrix containing bundles of collagen fibres. It forms external pinnae of ear and epiglottis.

---

61 **What is axial skeleton?**

Ans: The skeleton that includes the skull, the vertebrae, and the ribs and the sternum is called axial skeleton.

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62. **Name the bones of cranium.**

Ans: Parietal and temporal are paired bones, whereas frontal, occipital, sphenoid and ethmoid are unpaired bones.

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63. **Name the bones of facial region?**

Ans: The paired facial bones are maxilla, zygomatic, nasal, lacrimal, palatine and inferior concha. The unpaired facial bones are mandible and vomer.

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64. **What is vertebral column?**

Ans: Vertebral column extends from skull to the pelvis to form backbone, which protects the spinal cord. It consists of 33 vertebrae. The vertebrae are named according to their location in the body, viz, cervical, thoracic, lumbar and pelvic.

65. **What is sacrum?**

Ans: Sacrum is formed by the fusion of anterior five vertebrae present in the pelvic region.

66. **What is coccyx?**

Ans: Coccyx is formed by the fusion of four posterior vertebrae present in the pelvic region.

67. **Why lower two pairs of ribs are called "floating ribs"?**

Ans: The lower two pairs of ribs are **called** floating ribs because they do not attach with the sternum.

68. **What is appendicular skeleton?**

Ans: The skeleton that consists of pectoral girdle and appendages (fore limbs) and pelvic girdle and appendages (hind limbs) is called appendicular skeleton.

69. **What does pectoral girdle comprise?**

Ans: Pectoral girdle attaches the arms to the trunk. It comprises scapula, supra-scapula and clavicle. The clavicle connects scapula with sternum.

70. **Name different bones of fore limb.**

Ans: The fore limb consists of humerus, radius, ulna, 8 carpals, 5 metacarpals and 14 phalanges.

71. **What are important features of pelvic girdle?**

Ans: Pelvic girdle attaches the hind limb to the vertebral column. It consists of two coxal bones. Each is formed by the fusion of three bones ilium, ischium and pubis.

72. **Name different parts of hind limb.**

Ans: The hind limb consists of one femur, 2 tibia + fibula, 8 tarsals, 5 metatarsals and 14 phalanges.

73. **What different classes of joints on the basis of structure?**

Ans: Joints are also classified on the basis of structure:

- ❖ Fibrous Joints.
- ❖ Cartilaginous Joints.
- ❖ Synovial Joints.

74. **What are hinge joints?**

Ans: The joint that allows the movements in two directions is **called** hinge joint. These are at elbow and knee.

75. **What are ball & socket joints?**

Ans: These joints allow movement in several directions. Such joints have at least two pairs of muscles present perpendicular to each other. Hip joint and shoulder joint are the **examples** of ball and socket joints.

76. **What is cleft palate?**

Ans: Cleft palate is a condition in which palatine processes of maxilla and palatine fail to fuse.

77. **What is arthritis?**

Ans: Arthritis covers over 100 different types of inflammatory or degenerative diseases that damage the joints. It **results** in pain, stiffness, of the joints. Friction is increased.

78. **What is osteoporosis?**

Ans: Osteoporosis is a condition of brittle and fragile bones. In this case bone mass is reduced and chemical composition of the matrix remains normal. Osteoporosis mostly occurs in aged women, which have decreased oestrogen level.

79. **What is osteomalcia?**

Ans: Osteomalcia (soft bone) includes a number of disorders in which the bones receive inadequate minerals. In this disease calcium salts are not deposited and hence bones soften and weaken. Weight bearing bones of legs and pelvis bend and deform.

80. **What is rickets?**

Ans: Rickets is a disease in children with bowed legs and deformed pelvis. It is caused by deficiency of calcium in diet or vitamin D deficiency.

81. **What is disc-slip?**

Ans: Severe or sudden physical trauma to spines for **example** from bending forward while lifting a heavy object may result in herniation of one or more disc. The herniated or slipped disc usually involves rupture of annulus fibrosus followed by protrusion of the spongy nucleus pulposus.

82. **What is closed reduction?**

Ans: In closed reduction the bone end is coaxed back to their normal position by physician's hand.

83. **What is open reduction?**

Ans: In open reduction surgery is performed and the bone ends are secured together with pins or wires.

84. **What are muscles?**

Ans: Many multicellular animals have evolved specialized **cells** muscles for movement. They contain numerous filaments of special proteins, actin and myosin.

85. **Name different types of muscles in vertebrates.**

Ans: The vertebrates possess three kinds of muscles:

- ❖ Smooth muscles.
- ❖ Skeletal muscles.
- ❖ Cardiac muscles.

86. **What are smooth muscles?**

Ans: Smooth muscles are long and spindle shaped with each containing a single nucleus. It has no striations. It is not under the voluntary control. These muscles are found in the blood vessels, digestive tract and many other organs.

87. **What are cardiac muscles?**

Ans: These are muscles of the heart. Heart muscles are composed of chains of single cell, each with its own nucleus. The chain of cells is organized into fibres that are branched and interconnected. The cardiac muscles are striated an involuntary.

88. **What are skeletal muscles?**

Ans: The muscles that are attached with the skeleton and associated with the movement of bones are **called** skeletal muscles. The skeletal muscles are voluntary and striated.

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89. **What are tendons?**

Ans: Generally each end of entire skeleton muscle is attached to bone by a bundle of collagen, non-elastic fibres **known** as tendons.

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90. **What is muscle fibre?**

Ans: Each muscle consists of muscle bundles, which are further composed of fibres or cells. Each muscle fibre is long cylindrical cell with multiple oval nuclei arranged just beneath its sarcolemma. Their diameter is 10-100 micro meter.

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91. **What is sarcolemma and sarcoplasm?**

Ans: The cell membrane of muscle cell is called sarcolemma while its cytoplasm is called sarcoplasm.

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92. **What are myofibrils?**

Ans: When viewed in high magnification, each muscles fibre is seen to contain a large number of myofibrils, 1-2 mm in diameter that run in parallel fashion and extend the entire length of the cell.

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93. **What are dark and light bands in sarcoplasm?**

Ans: The dark bands are called A band because they are anisotropic that is they can polarize visible light. The light bands are **called** I band are isotropic or non-polarizing.

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94. **What are H-zone and M-line in A band of sarcomere?**

Ans: Each A band has a lighter stripe in its midsection **called** H-zone (H stands for hele means bright). The H-zone is bisected by dark line **called** M-line.

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95. **What is T-system?**

Ans: The sarcolemma of muscle fibre cell penetrates deep into the cell to form hollow elongated tube, the transverse tubule or T-tubule. The thousands of T-tubules of each muscle cell are collectively **called** T-system.

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96. **What are triads?**

Ans: The T-tubule and terminal portion of the adjacent envelope of sarcoplasmic reticulum form triads at regular interval along the length of the myofibril.

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97. **What is sliding filament model?**

Ans: According to this model the thin filament slide past the thick one's so that actin and myosin filaments overlap to greater degree.

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98. **What is a motor unit?**

Ans: All the fibres innervated by a single motor neuron are a Motor Unit and contract simultaneously in response to the action potential fired by the motor neurons.

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99. **What are other sources of energy for muscle contraction in addition to glucose?**

Ans: When more energy is required due to high metabolism, it is provided by another energy storing substances **called** creatine phosphate.

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100. **What is muscle fatigue?**

Ans: Muscle fatigue is a state of physiological inability to contract. Muscle fatigue results

from relative deficit of ATP. Excess accumulation of lactic acid and ionic imbalances also contribute to muscle fatigue.

101. **What is tetany?**

Ans: Tetany is the disease caused by low calcium in the blood. It increases the excitability of neurons in loss of sensations. Muscle twitches and convulsion occur.

102. **What is cramp?**

Ans: It is also **known** as tetanic contraction of entire muscle. It lasts for just few seconds or several hours, causing the muscles to become stretched and painful. It is most common in thigh and hip muscles.

103. **What are different parts of skeletal muscle?**

Ans: Skeletal muscles has three parts:

- ❖ Origin.
- ❖ Insertion.
- ❖ Belly.

104. **What are ligaments and tendons?**

Ans: Ligaments attach bone to bone and are slightly elastic and tendons attach muscles to bones and are non-elastic.

105. **What is antagonistic arrangement?**

Ans: At joint the muscles work against each other by contraction. This relationship is **called** antagonistic arrangement.

106. **What are brachialis & brachioradialis?**

Ans: These muscles lie below the biceps brachii. The brachialis is inserted in the ulna, while brachioradialis is inserted in the radius. When these muscles contract the lift ulna and radius and bend the arm at the elbow.

107. **What are organs of locomotion in euglena, paramecium and amoeba?**

Ans: Euglena moves with the help of flagellum. Paramecium moves with the help of cilia. Amoeba moves by means of pseudopodia.

108. **What is effective stroke?**

Ans: Five out of nine double fibrils contract or slide simultaneously, cilia bend or shorten. It is **called** effective stroke.

109. **What is recovery stroke?**

Ans: The four out of nine double fibril contract and cilia become straight. It is called recovery stroke.

110. **What is the type of locomotion in jellyfish and earthworm?**

Ans: Jelly fish moves by jet propulsion. Earthworm shows accordion-like movement, in which setae and muscles both are involved.