**SUPPORT AND MOVEMENT IN PLANTS AND ANIMALS**

***REVISION QUESTIONS***

1. **What is the importance of support?**
2. *In animals*

* Supports the weight of the animal’s body
* The skeleton framework gives the body its shape
* Skeleton provides surface area for attachment of body muscles to facilitate movement.

1. *In plants*

* Brings about fertilization; swimming of male gametes in bryophytes & pteridophytes and growth of pollen tube.
* Enables plants to obtain resources from environment such as light, water and nutrients

*Brings about nastic and tropic movement*

* Enables plants to escape or avoid harmful stimuli such as high temperature
* Helps plants to withstand the forces in the environment(gravity, wind & common storms)
* Helps in supporting heavy loads of their own mass, including the animals that climb or live on them. (Tying animals, climbing a tree).
* Brings about efficiency of photosynthesis

1. **(i). Name the different types of support tissue in plants**

* Parenchyma tissue
* Collenchyma tissue
* Sclerenchyma tissue
* Tendrils
* Spines and rhomes
* Xylem vessels and tracheid/fibres

**(ii). Name two different types skeletons in animals, giving an example of an animal for each named skeleton**

* Hydrostatic skeleton,earthworm
* Exoskeleton (Anthropoids family; crab, grasshopper,centipede,millipede).
* Endoskeleton (vertebrate; fish)

1. **(a). List down the different bones found in**

(i). Axial skeleton

* Skull
* Sternum
* Ribcage
* Vertebral column

(ii). Appendicular skeleton in human

* Girdles (pectoral girdle and pelvic girdle-hip girdles
* Limbs (fore-limbs and hind-limbs).

**(b). what is the difference between exoskeleton and endoskeleton?**

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| Exoskeleton | Endoskeleton |
| * Found in arthropods * Limits growth * Supports and protects inner delicate * Muscles are enclosed inside the exoskeleton | * Found in vertebrates * Grow steadily within the animal * Protects delicate internal organs e.g heart, lungs, brain. * Muscles are external to the hard framework |
| Made up of secreted substances (chitin) | Made up of living tissue i.e. cartilage or bone |

1. **Describe movement in a finned fish**

* Has streamlined body shape; this reduces resistance against movement and enables it to cut through water easily.
* Has an inflexible head that enables it to maintain forward thrush.
* Has scales that overlap and are pointed backwards to allow water pass over the fish without any obstruction.
* Secretes mucus which covers the body, this reduces friction during movement.
* Has flexible backbone; this enables the muscles to contract & relax to bring about undulating movement.
* Possess swim bladder; which provides buoyancy and also helps the fish to adjust it vertical position in relation to depth in water.
* Possess lateral line system; this enables it to detect vibrations & change of pressure in water thus enabling fish to respond suitably.
* Well developed fins which are used for maintaining balance, braking & changing direction.
* Pectoral fins act as pivot around which the fish can turn rapidly
* Pectoral and pelvic fins control pitching of the fish; upward and downward movement.
* Unpaired fins (dorsal, anal, and caudal) reduce rolling (rocking from side to side).
* Caudal fins propel the fish forward and steers the fish while in motion.

1. **(a). What role do the following features play in movement of a tilapia fish?**

**(i). Myotomes-**contract and relax to bring about undulating movement.

**(ii). Fins-**helps fish to move in water

**-**helps fish to maintain balance, steer the fish and bring about swimming.

**Types of fins**

Unpaired fins (dorsal, anal and caudal).

* Reduce rolling (rocking side to side).
* Reduce lateral deflection of body yawing.
* Caudal fin propels the fish forward, steers the fish while in motion

Paired fins (pelvic and pectoral fins).

* Maintaining balance
* Braking
* Changing direction
* Acts as pivot for the fish to turn rapidly
* Controls pitching; upward and downward movement.

**(iii). Swim bladder-**provides the fish with buoyancy; helps the fish to adjust its vertical position in relation to depth in water.

**(iv). Overlapping and backward pointing scales-**allows water to pass over the fish easily without obstruction.

**(v). Tail with high tail power (caudal)-**propels the fish forward and steers the fish while in motion.

**(b). State the necessity of movement in animals**

* Search for food
* Enables dispersion and colonization of new habitats
* Escape from predators and hostile environment
* Look for mate and breeding grounds

1. **(i). Name three types of strengthening tissues found in plants**

* Collenchymas tissue
* Parenchyma tissue-packaging,mechanical support
* Sclerenchyma tissue-mechanical support
* Xylem vessels and tracheid.-transport,give strength and support to the stem

(ii). **Some herbaceous stems have very little strengthening tissues yet still remain upright. Suggest how they are able to do this.**

* Because they obtain support by twinning round other plants e.g. passion fruit stems, morning glory.
* Turgidity of parenchyma cells
* Thickening of collenchymatous cells by cellulose
* Thickening of the sclerenchyma tissue by dead cells of lignin

1. **Name three types of muscles found in the human body, state where each type is located and how each is adapted to its functions.**

Skeletal muscles/striated muscle

Attached on the skeleton, play an important role in locomotion

*Adaptations*

* Contains myofibril which has the ability to contract to bring about movement
* Mitochondria is present; produces energy required for the muscles to contract
* Contraction of the muscles creates a force which brings about appropriate movement of the skeleton

Smooth or visceral muscles

Found on the walls tubular visceral organs (blood vessels, gut, urinary tract, reproductive tract and respiratory tract).

*Adaptations*

* Lack cross striations hence referred to as smooth muscles
* Capable of contracting slowly and fatigue slowly to bring about involuntary movement

Cardiac muscle

Heart muscle

Adaptations

* Have intercalated discs that forms bridges between fibres hence transmit impulses rapidly throughout the heart.
* Contain mitochondrial which produces energy to sustain energy demand

1. **Define and state the function of each of the following**

**(i). Tendon-**Is an inelastic tissue where joint muscles are attached to bones

**(ii). A Ligament-**Is an elastic tissue that hold bones together at a movable joint.

1. (i). Draw and label a hinge joint and a ball and socket joint

(ii). What are the differences between hinge and ball and socket joint?

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| Ball and socket joint | Hinge joint |
| Movement is possible in all directions(360o) | Allows Movement in only one direction(180o) |
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