

**Topic :- Locomotion & Movement**

- 2 (a)  
**Hindlimb Leg bones** Each lower limb has 30 bones  
Femur (2) - Thigh  
Patella (2) - Knee  
Tibia (2) - Shank  
Fibula (2) - Shank  
Tarsal ( $14 = 2 \times 7$ ) - Ankle  
Metatarsal ( $10 = 2 \times 5$ ) - Sole  
Phalanges - ( $28 = 2 \times 14$ ) - Toes
- 3 (b)  
The human skull articulates with the superior region of the vertebral column with the help of two occipital condyles, that's why human skull is called dicondylic skull
- 4 (d)  
The thin filament of skeletal muscle fibre is composed of three distinct proteins, *i.e.*, actin, tropomyosin and troponin. Troponin-I inhibits the F-actin -mysosin intraction and also binds to other components of troponin. Tropomyosin is fibrous molecule that attaches to F-actin in the groove between its filaments.
- 5 (a)  
Presence of Haversian canal is the characteristic feature of mammalian bones.
- 6 (d)  
*Synovial joints are of following types*  
(i) **Ball and Socket Joint** Between humerous and pectoral girdle  
(ii) **Hinge Joints** Knee joint  
(iii) **Pivot Joint** Between atlas and axis  
(iv) **Gliding joints** Between carpals  
(v) **Saddle joints** Between carpals and metacarpals of thumb
- 7 (b)  
Atlas and axis are joined by pivot joint. It is also known as rotatoria (rotatory joint). Pivot joint fixes one of the two bones in its place and bear a peg like process over, which the other bone rotates.
- 8 (c)  
Almost all mammals (including giraffe) have seven cervical vertebrae, of which first is atlas and second is axis.
- 9 (d)

Each myofibrils contains alternate dark and light bands. Light bands contains actin and is called I-band or isotropic band, whereas the dark bands are called A or anisotropic bands containing myosin

10 (a)

The skeleton muscles bring about voluntary movement under conscious control of brain and hence, called voluntary muscles. The segment of a fibril between two adjacent Z-bands is called a **sarcomere**.

11 (d)

Globular head with short arm and the tail are the part of HMM (Heavy Meromyosin) and LMM (Light Meromyosin) respectively. These are the parts of meromyosin filament. Many meromyosin filaments polymerized to form thick filaments (myosin)

12 (b)

**Ligaments** consist of mainly collagen fibres and some elastic fibres. It connects end of a long bone to another.

13 (c)

Synsacrum is the thoracic region of vertebral column in fowl. It consists of about 16 fused vertebrae and provides support to ilia bones of immense pelvic girdle.

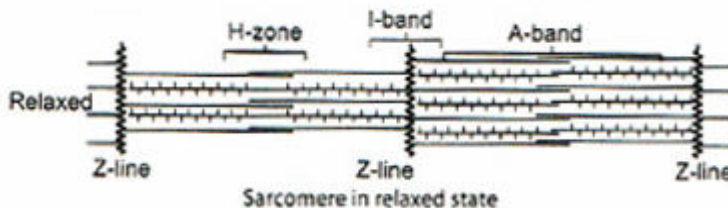
14 (b)

Thin and thick filament respectively.

Both proteins, *i.e.*, actin and myosin are arranged as rod-like structure, parallel to each other and also to the longitudinal axis of the myofibrils. Actin filaments are thinner as compared to myosin filaments, hence they are commonly called thin and thick filaments respectively

15 (b)

2 Z-lines.



The thick filaments lies parallel to one another and thin filaments are present in orderly array between the thick filaments. In the centre of the I-band, there is a band of amorphous material called Z-line. In the middle of the A-band a comparatively less dark zone called H-zone of band is present. The area between the two Z-lines is called sarcomere. M-line is present, in the middle of H-zone

16 (b)

Visceral muscles.

Visceral muscles are located in the inner wall of hollow visceral organs of the body like the alimentary canal, reproductive tract, etc. They don't exhibit any striation and are smooth in

appearance hence they are called smooth muscles (non-striated muscles). Their activities are not under the voluntary control of the nervous system and are therefore, called involuntary muscles. They assist, for example, in the transportation of food through the digestive tract and gametes through the genital tract

17 **(b)**

Each middle ear contains three tiny bones (i) Malleus (ii) Incus (iii) Stapes which are collectively called ear ossicles

18 **(a)**

**White Skeletal Muscle** (Fast twitch fibre) Their fibres are much thicker and of light colour due to the absence of myoglobin. The number of mitochondria is low in white fibres. They have little or no store of oxygen. They are meant for fast and strenuous physical activity over a short duration as they get tired soon. They carry out anaerobic contraction with accumulating lactic acid, *e.g.*, muscles of eye ball, flight muscle of fast flying birds such as sparrows

19 **(b)**

$Ca^{2+}$

20 **(a)**

Muscle contraction is initiated by a signal sent by Central Nervous System (CNS), *via* motor neurons. A motor neuron along with the muscle fibres connected to it constitutes a motor unit

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	A	A	B	D	A	D	B	C	D	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	B	C	B	B	B	B	A	B	A