



# BIOLOGY

## BOOKS - CHETANA BIOLOGY (MARATHI ENGLISH)

### LOCOMOTION AND THEIR MOVEMENTS

**Example**

1. Explain the different types of muscular tissues.



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2. Name the type of muscles which bring about running and speaking?



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**3.** Name the muscles which do not contract as per our will.



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**4.** Which types of muscles show rhythmic contractions?



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5. Which type of muscle is the diaphragm of the respiratory system?



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6. Name the part of human skeleton situated along the vertical axis.



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7. State the types of movements.



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**8. What are the different types of muscles?**



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**9. Why are movement and locomotion necessary among animals kingdom?**



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**10.** State the property of muscle used effectively in muscular movement? How is muscle fatigue caused?



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**11.** Define the following:

Locomotion



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**12. Define the following:**

Tendons



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**13. Define the following:**

Movements and locomotion



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**14.** State the oxygen carrying pigment present in the skeletal muscle.



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**15.** Explain the different types of locomotory movements.



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**16.** Why do we shiver during winter?





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17. Why do muscles show spasm after rigorous contraction? OR

Muscles show spasm after rigorous contraction. Give reason.



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18. Did you ever feel tickling in muscles?



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**19.** How are striated muscles classified?



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**20.** What describe the location and structure of skeletal muscle.



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21. Raju intends to train biceps, while exercising using dumbbells, which joints should remain stationary and which should move?



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22. Differentiate between

Flexor and Extensor muscles :



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**23.** Differentiate between

Pronator and Supinator :



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**24.** What are antagonistic muscles? Explain with examples.



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**25.** Why a red muscle can work for prolonged period whereas white muscle fiber suffers from fatigue after a shorter work?



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**26.** How is the structure of sarcomere suitable for the contractility of the muscle? Explain its function according to sliding filament theory?



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27. Write short note on Actin Filament.



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28. State the energy which is converted to mechanical energy during contraction.



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29. State the role of calcium ions in contraction and relaxation of muscles.





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**30.** Why is muscle fiber a syncitium? How are myofilaments arranged in it?



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**31.** State the two important parts of meromyosin.



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**32.** What is believed to initiate the contraction process?



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**33.** What is the role of ATP in muscle contraction?



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**34.** What kind of contraction occurs in your neck muscles while you are reading your class



assignment?



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**35.** Collect information about 'T' Tubules of sarcoplasmic reticulum.



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**36.** Describe the physiology of muscle relaxation.



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**37.** Why are muscles rich in creatine Phosphate? OR

How does creatine phosphate function in the muscle cell?



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**38.** What do you understand by muscle twitch?



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**39.** What are the causes of muscle twitch?



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**40.** State the significance of Oxygen debt.



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**41.** Explain briefly Rigor Mortis.



**Watch Video Solution**

**42.** Explain briefly Rigor Mortis.



**Watch Video Solution**

**43.** Write short note on Role of calcium ion in contraction and relaxation of muscles.



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**44.** Define:

Single muscle twitch





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**45. Define:**

Summation:



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**46. Define:**

Tetanus:



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**47. Define:**

Refractory period:



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**48. Define:**

Threshold stimulus:



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**49. What do you understand by muscle twitch?**



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**50.** State the stages for the occurrence of single muscle twitch



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**51.** Explain all or none principle / Bowditch's law.



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**52.** State the significance of Oxygen debt.



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**53.** Can you compare bone, muscle and joint which help in locomotion with any of simple machines you have studied earlier?



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**54.** What are the components of our skeletal system?



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**55.** What type of bones are present in our body?



**Watch Video Solution**

**56.** What are the components of our skeletal system?



**Watch Video Solution**

**57.** What type of bones are present in our body?



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**58.** How do bones help us in various ways?



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**59.** Write a short note on Hyoid bone.



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**60.** Enlist the bones of Cranium.



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61. If police suspect strangulation, they carefully inspect hyoid bone and cartilage of larynx. These get fractured during strangulation. Various such investigations are done in case of suspicious death of an individual where ossification of sutures in skull, width of pelvic girdle, etc. are examined to find out approximate age of victim or gender of victim, etc. You may find out information about forensic science.



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**62.** Find out information about sinuses present in skull, functions of skull and disorder 'sinusitis'.



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**63.** Feel your spine (vertebral Column) is it straight or curved?



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**64.** You will study about intervertebral discs in this chapter. Find information about slipped disc.



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**65.** Enlist the functions of vertebral column?



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**66.** Describe a typical lumbar vertebra.



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**67.** Explain the structure of axis vertebra.



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**68.** Why are long bones slightly bent and not straight?



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**69.** If your elbow joint would be fixed type of joint and joint between teeth and gum would be freely moveable.



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**70.** What are joints? What are their types?



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**71.** Define joint.





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**72.** What is arthrology?



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**73.** How are the bones in our body joined to each other?



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74. What is the significance of joints?



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75. Which suture is present between parietal bones and occipital bone?



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76. Give two examples of cartilaginous joint.



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**77.** Distinguish between Fibrous joints and Cartilaginous joints.



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**78.** What is Diarthroses (synovial joints)



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**79.** Enumerate types of synovial joint.



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**80.** Draw labeled diagram for Synovial joint.



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**81.** Differentiate between Fibrous, Cartilaginous and Synovial joints.



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**82.** Classify various type of joints found in human body. Present the information in the form of chart. Give examples of each type.



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**83.** Human beings can hold an object in a better manner than monkeys. Why?



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**84.** What makes the synovial joint freely moveable?



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**85.** Now a days we hear from many elderly people that they are undergoing knee replacement surgery. Find out why one has to undergo knee replacement, how it is carried out and how it can be prevented.



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**86.** You must have heard of Sachin Tendulkar suffering from 'Tennis Elbow' a cricketer suffering from a disorder named after another game. Can common people too suffer from this disorder?



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**87.** What is muscular dystrophy? OR

Write a short note on muscular dystrophy?



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**88.** Write a note on Myasthenia gravis. OR

What are the causes, symptoms of myasthenia gravis?



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**89.** Describe Osteoporosis.



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**90.** Name any two disorders of skeletal system.



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**91.** What is Arthritis? What are its types?



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**92.** Name the disorder caused due to accumulation of uric acid in joints.



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**93.** Describe Tetany.



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**94.** Find out information about types of fractures and how they heal.



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**95.** In a road accident, Moses fractured his leg. One of the passer by, tied a wooden plank to the fractured leg while Moses was rushed to the hospital was this essential? Why?



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**96.** Ragini, a 50 year old office goer, suffered hair line cracks in her right & left foot in short intervals of time. She was worried about mirror jerks leading to hair line cracks in

bones. Doctor explained to her why it must be happening and prescribed medicines.

What must be cause of Ragini's problem? Why has it occurred? What precautions she should have taken earlier? Why care she should take in future?



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**97. Differentiate between:**

**Actin Filament and Myosin Filament:**



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**98.** Differentiate between:

I-Band and A-Band:



**Watch Video Solution**

**99.** Differentiate between:

Skeletal Muscle and Cardiac Muscle:



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**100.** Differentiate between:

Red Muscle Fibres and White Muscle Fibre



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**101.** Functions of Ribs:



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**102.** Name the contractile proteins present in the muscle.



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**103.** What is sarcomere?



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**104.** Why all locomotion are movement but all movements are not locomotion?



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**105.** Differentiate between locomotion and Movement.



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## Exercise

**1.** The structural and functional unit of striated muscle fibres is..... .

A. cross bridges



B. myofibril

C. sarcomere

D. z-bond

**Answer:**



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2. A person slips from the staircase and breaks his ankle bone. Which bones are involved?

A. Carpals

B. Tarsal

C. Metacarpals

D. Metatarsals

**Answer:**



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**3. Muscle fatigue is due to accumulation of**

.....

A. pyruvic acid

B. lactic acid

C. malic acid

D. succinic acid

**Answer:**



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4. Swelling of sprained foot is reduced by soaking in hot water containing a large amount of common salt,

- A. due to osmosis
- B. due to plasmolysis
- C. due to electrolysis
- D. due to photolysis

**Answer:**



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**5. Role of calcium in muscle contraction is .....**

- A. to break the cross bridges as a cofactor  
in the hydrolysis of ATP
- B. to bind with troponin, changing its  
shape so that the actin filamen is  
exposed
- C. to transmit the action potential across  
the neuromuscular junction.
- D. to re-establish the polarisation of the  
plasma membrane following an action  
potential

**Answer:**



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**6.** Hyper-secretion of parathormone can cause which of the following disorders?

A. Gout

B. Rheumatoidarthritis

C. Osteoporosis

D. Gull's disease

**Answer:**



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7. Locomotion in sperms takes place with the help of .....

A. flagella

B. cilia

C. pseudopodia

D. muscles

**Answer:**



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**8. Bones act as.....during locomotion.**

A. levers

B. fulcrum

C. pulleys

D. points

**Answer:**





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9. Sutures on the skull are.....joints.

A. freely movable

B. slightly movable

C. diarthrosis

D. synostosis

**Answer:**



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10. Intervertebral disc consists of ..... .

A. fibrous connective tissue

B. fibrous cartilage

C. calcified cartilage

D. bone

**Answer:**



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11. Slightly movable joints are also known as

..... .

A. synarthrosis

B. amphiarthrosis

C. diarthrosis

D. synostosis

**Answer:**



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12. Synovial fluid is present in .....

- A. freely movable joint
- B. fixed joint
- C. slightly movable joint
- D. cartilagenous joint

**Answer:**



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13. Two articulating bones are connected by .....

.

A. tendon

B. cartilage

C. ligament

D. fibres

**Answer:**



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14. Elbow joints are .....joint.

A. slightly movable

B. immovable

C. freely movable

D. movable

**Answer:**



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**15.** Human body consists of about .....different types of muscles.

A. 650

B. 460

C. 540

D. 400

**Answer: A**



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**16.** Muscles attach to the bones with the help of ... .

A. ligament

B. cartilage

C. tendon

D. cord

**Answer:**



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17. Actin binding sites are located on .....

A. troponin

B. tropomyosin

C. meromyosin

D. both (b) and (c)

**Answer:**



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**18.** Coccygeal bone is formed by the fusion of..... bones in man.

A. ilium, ischium and pubis

B. scapula and clavicle

C. ilium and scapula

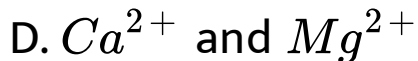
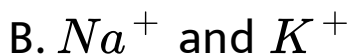
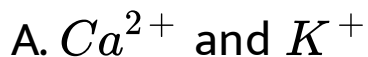
D. ilium, scapula and ischium

**Answer:**



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19. Chemical ions responsible for muscle contraction are



**Answer:**



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20. The joint of radio-ulna with the upper arm is..... .

A. hinge joint

B. pivot joint

C. socket joint

D. none of these

**Answer:**



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21. Which of the following options shows the correct order of some states of muscle contraction from the beginning to the end of the process?

A. Stimuli —» Neurotransmitter secretion  
—» Release of  $Ca^{2+}$  —» Cross bridges  
formation — » Excitation of T-system —»  
Sliding of actin filaments

B. Stimuli —» Neurotransmitter secretion  
—» Excitation of T-system — » Release of

$Ca^{2+}$  » Cross bridges formation -»

Sliding of actin filaments — » 'H' band  
diminishes

C. Stimuli — » Excitation of T-system —»

Neurotransmitter secretion —» Cross

bridges formation — » Sliding of actin

filaments —» 'H' band diminishes

D. Stimuli —» Neurotransmitter secretion

—» Cross bridge formation —»

Excitation of T-system -> Sliding of actin filaments

**Answer:**



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**22.** Read the statements regarding muscle proteins.

(I) Actin is a thin filament and is made up of two F-actins.

(II) The complex protein, tropomyosin is

distributed at regular intervals of troponin.

(II) Myosin is a thick filament which is also a polymerized protein.

(IV) The globular head of meromyosin consists of light meromyosin (LMM).

Which of the above statements are correct?

A. I, II and III

B. I, II and IV

C. I and III

D. II and IV

**Answer:**





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**23.** The number of occipital condyles in man is/are..... .

A. one

B. two

C. three

D. four

**Answer:**



24. The joint found in head of upper arm and pectoral girdle is a .....

- A. hinge joint
- B. ball and socket joint
- C. gliding joint
- D. saddle joint

**Answer:**



25. Elbow joint is an example of .....

A. pivot joint

B. hinge joint

C. gliding joint

D. ball and socket joint

**Answer:**



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26. During the muscle contraction, which zone decreases?

A. I-zone

B. Z-zone

C. H-zone

D. Both -A and C

**Answer:**



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27. The longest bone of the human body is .....

.

A. humerus

B. tibia

C. veterbra

D. femur

**Answer:**



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28. The polysaccharide portion a proteoglycan present in the matrix of cartilage is known as

A. ossein

B. cartilin

C. casein

D. chondroitin

**Answer:**



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**29.** Find out the correct order of number of bones in the parts of skull such as cranial bone, facial bone, hyoid bone and middle ear bone respectively

A. 14,8, 1 and 3

B. 3,8 14 and 1

C. 14,8,3 and 1

D. 8, 14, 1 and 3

**Answer:**



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**30.** Consider the following statements.

(I) In man, vertebral column has 33 bones organized as 28 bones.

(II) Pelvic girdles is made up of two fused bones only.

(III) Osteoporosis is characterized by micro-architectural deterioration of the bone

A. (I) is correct

B. (II) is correct



C. (III) is correct

D. (I) is incorrect

**Answer: C**



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**31.** Which of the following statements is/are correct/ incorrect?

(I) A-bands of the muscle is dark and contain myosin.

(II) I-bands are the light bands and contain

actin.

(II) during muscle contraction, the A-band contracts.

(IV) The part between the two H-lines is called as sarcomere.

(V) The central part of thin filament, not overlapped by thick filament is called H-zone.

A. (I),(II) and (III) are correct, while (IV) and (V) are incorrect.

B. (I),(II),(IV) are correct, while (III), (V) are incorrect.

C. (I) and (II) are correct, while (III),(IV) and (V) are incorrect.

D. (I),(II),(III) and (V) are correct, while (IV) is incorrect.

**Answer:**



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**32.** Which of the following features differentiate bone from cartilage?

A. Haversian canal

B. Blood vessel

C. Lymph vessel

D. All of these

**Answer:**



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**33.** Cancellous bone is one which has:

A. calcified cartilage

B. spongy bone

C. compact bone

D. none of above

**Answer:**



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**34.** How many bones are there in one half of the lower jaw of human?

A. Three

B. Four

C. One

D. Eight

**Answer:**



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**35.** Human backbone consists of:

A. 30 vertebrae

B. 31 vertebrae

C. 32 vertebrae

D. 33 vertebrae

**Answer: D**



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**36.** In mammals, the number of cervical (neck) vertebrae is typically:

A. 5

B. 7

C. 9

D. 11

**Answer:**



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**37. Which of the following helps in nodding?**

A. Atlas vertebra

B. Axis vertebra

C. Both the above



D. None of these

**Answer:**



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**38.** The total number of ball and socket joints in man's body is:

A. two

B. four

C. eight

D. sixteen

**Answer:**



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**39.** Head of humerus articulates in the:

A. ossified cavity

B. glenoid cavity

C. sigmoid cavity

D. acetabulum

**Answer:**



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**40. Acetabulum is associated with:**

- A. pelvic girdle
- B. pectoral girdle
- C. cranium
- D. vertebral column

**Answer:**



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41. Through which aperture the spinal cord passes out of the skull

- A. Foramen ovale
- B. Foramen magnum
- C. Foramen of Panzee
- D. Foramen of Monro

**Answer:**



42. The sagittal suture is positioned between the ...

- A. sphenoid and temporal bones
- B. temporal and parietal bones
- C. occipital and parietal bones
- D. right and left parietal bones

**Answer:**



**43.** Intervertebral disc is a .....

- A. fibrocartilage between the centrum of vertebrae
- B. pad in the centrum of bone
- C. cartilage bone in the body
- D. body of vertebrae

**Answer:**



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**44.** Gout is a disease that affects the joints and leads to arthritis. It is associated with an abnormality of..... .

A. pyrimidine metabolism

B. purine metabolism

C. fat metabolism

D. protein metabolism

**Answer:**



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**45.** Collar bone is also known as

A. scapula

B. coracoid

C. petella

D. clavicle

**Answer:**



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**46.** Coccygeal bone is formed by the fusion of..... bones in man.

A. three vertebrae

B. six vertebrae

C. five vertebrae

D. four vertebrae

**Answer:**



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47. Vertebral formula for human beings is

A.  $C_3T_{12}L_7S_5C_{3-5} = 33 - 35$

B.  $C_7T_{12}L_5S_5C_{3-5} = 33 - 35$

C.  $C_5T_{10}L_5S_5C_{3-5} = 33(D)$

D.  $C_7T_{10}L_7S_5C_{3-5} = 33$

**Answer:**



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48. The process of bone formation is called

A. ossification

B. calcification

C. magnification

D. none of these

**Answer:**



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**49.** The cytoplasmic segment of striated muscle fibre is termed..... .

A. metamere

B. neuromere

C. sarcoplasm

D. sarcomere

**Answer:**



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**50.** Term 'innominate' is related with .....

A. nerve

B. artery

C. skeleton and artery

D. none of these

**Answer:**



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**51. Cartilaginous joints .....**

A. permit slight movements

B. are found in symphysis

C. are found in the bodies of vertebrae

D. All of the above

**Answer:**



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**52.** Six of the 206 bones of human skeleton occur in ..... .

A. skull

B. middle ear

C. pectoral girdle

D. pelvic girdle

**Answer:**



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**53.** .....pairs of ribs are floating ribs.

A. 7

B. 2

C. 5

D. 3

**Answer:**



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**54.** Sutures on the skull are.....joints.

A. Synovial

B. Freely moveable

C. Immoveable

D. slightly moveable



**Answer:**



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**55.** During locomotion joints acts as ..... .

A. Levers

B. fulcrum

C. pulleys

D. Points

**Answer:**



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**56.** Locomotion in sperms takes place with the help of .....

A. flagella

B. cilia

C. Muscles

D. Pseudopodia

**Answer: A**



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**57.** State the number of bones and muscles in human body.



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**58.** Give the name of the funny bone.



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**59.** Where is ball and socket joint present in human body?



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**60.** List the bones helping in hearing.



**Watch Video Solution**

**61.** Write a note on osteoporosis.



**Watch Video Solution**

**62.** How is the structure of sarcomere suitable for the contractility of the muscle? Explain its function according to sliding filament theory?



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