LOCOMOTION AND MOVEMENT

QUESTIONS:

01. In a sarcomere of a mammal, the numbers of Z-lines, H-zones, M-lines and triad systems respectively are

a) 2, 1, 2 and 2 b) ***2, 1, 1 and 2*** c) 2, 1, 1 and 1 d) 1, 2, 2 and 1

02. In a muscle, the region of sarcomere where actin and myosin filaments noticed is

a) Complete I-band b) Complete A-band c) H-zone d) ***A-I overlap***

03. Troponin-tropomyosin complex shifts away from active, when

a) Calcium binds with tropomyosin b) ***Calcium binds with troponin***

c) Calcium is stored by S.R d) Oxygen debt is established

04. The middle zone of A-band is provided

a) With thin filaments only b) ***With thick filaments only***

c) With thin and thick filaments d) Neither with thin nor thick filaments

05. Triad system is associated with "A-I junction" and "Z-membrane" in

a) Mammals

b) Vertebrates other than mammals

c) ***Mammals and vertebrates other than mammals respectively***

d) Vertebrates other than mammals and mammals respectively

06. In power stroke, the cross bridge swings towards H-zone

a) Immediately after the release of ADP

b) ***Immediately after the release of inorganic phosphorus***

c) After the withdrawal of calcium ions into S.R

d) Before the release of calcium ions from S.R

07. In anaerobic degradation, lactic acid formed in muscle is shifted to the following structure to produce glycogen

a) ***Liver*** b) Pancreas c) Brain d) Kidney

08. Shortening of a sarcomere during muscle contraction is due to

a) Contraction of thin and thick filaments

b) Sliding of both thin and thick filaments

c) ***Sliding of thin filaments over thick filaments***

d) Sliding of thick filaments over thin filaments

09. Cori cycle occurs in between

a) Liver and kidney b) Kidney and gonad

c) ***Liver and muscle*** d) Muscle and bone

10. The following acts as an immediate additional source of energy in muscle contraction of rabbit

a) Arginine phosphate b) ***Creatine phosphate***

c) Glycogen d) Unsaturated fatty acids

11. During the relaxation of muscle, the troponin permits the tropomyosin to cover the active site of thin filament when

a) Calcium binds with troponin

b) Creatine phosphate is present in sarcoplasm

c) ***Calcium detaches from troponin***

d) Creatine phosphate is absent in sarcoplasm

12. In a voluntary muscle, the lactic acid deposition leads to

a) Tetany b) ***Muscle fatigue*** c) Muscle strain d) Convulsions

13. Skeletal muscle fibres of human being are

a) Voluntary and uninucleated b) ***Voluntary and multinucleated***

c) Involuntary and uninucleated d) Involuntary and multinucleated

14. The following is true with respect to myofilaments of sarcomere

a) ***Primary filaments are thicker than secondary filaments***

b) Secondary filaments are thicker than primary filaments

c) Primary and secondary filaments are thin

d) Primary and secondary filaments are thick

15. Walk along mechanism in muscle contraction is the

a) Movement of thin filaments towards H-zone only

b) Movement of thin filaments away form H-zone only

c) ***Swinging movements of thin filaments over thick filaments***

d) Swinging movements of thick filaments over thin filaments

16. The event that does not occur during relaxation of muscle

a) Cross bridges between actomyosin complex break

b) Ca^{++} ions diffuse into sarcoplasmic reticulum

c) Tropomyosin covers active site of thin filament

d) ***Ca^{++} binds to TpC unit of troponin***

17. In a skeletal muscle fibre, the 'T' tubule is the extension of

a) Sarcoplasmic reticulum

b) ***Sarcolemma***

c) Sarcosome

d) Sarcomere

18. The two sarcomeres are separated by

a) Henson's discs

b) ***Krause's membranes***

c) M-lines

d) Isotropic bands

19. Krause's membrane is a bisecting

a) Dense line of two A-bands

b) ***Dense line of one I-band***

c) Dense line of two I-bands

d) Dense line of one H-zone

20. The following is the importance of creatine phosphate

a) Stimulating skeletal muscle to a maximum extent

b) Formation of thin and thick filaments for sliding movement

c) Abundant supply of calcium ions for muscle contraction

d) ***Supply of energy rich phosphorus to convert ADP into ATP***

21. If a stimulus beyond the threshold stimulus is given to a muscle, it

a) Contracts vigorously

b) ***Contracts with same force***

c) Contracts slowly

d) Undergoes immediately fatigue

22. The following muscle is highly inclined to fatigue

a) Muscle of myocardium b) Muscle of urinary bladder

c) ***Muscle of leg*** d) All the above

23. The following autoimmune disorder is due to imperfection of transmission of nerve impulse

a) ***Myasthenia gravis*** b) Grave's disease

c) Rheumatoid arthritis d) Addison's disease

24. Duchenne muscular dystrophy (DMD) is a

a) Degenerative disorder b) ***Genetic disorder***

c) Nutritional deficiency disease d) Epidemic disease

25. In tetany of muscle,

a) No contractions are seen b) Slow contractions are seen

c) ***Wild contractions are seen*** d) 1 or 2

26. Total number of bones found in human skull is

a) 22 b) ***29*** c) 35 d) 72

27. Jaw suspension in mammals is

a) Amphistylic b) Audodiastylic c) Hyostylic d) ***Craniostylic***

28. The following are forked but false ribs

a) Vertebrosternal ribs b) ***Vertebrochondral ribs***

c) Floating ribs d) All the thoracic ribs

29. Identify the correct statement

a) ***Syndesmosis is fibrous amphiarthrosis*** b) Synchondrosis is cartilaginous diarthrosis

c) Gomphosis is cartilaginous diarthrosis d) Symphysis is fibrous amphiarthrosis

30. Biaxial diarthrosis which can be seen in most of the mammals is

a) Pivot joint b) Cotyloid joint c) Saddle joint d) ***Condyloid joint***

31. The freely movable joint that found in axial skeleton only is

a) ***Pivot joint*** b) Condyloid joint c) Saddle joint d) Planar joint

32. Saddle joint is similar to

a) ***Ball and socket joint*** b) Pivot joint

c) Hinge joint d) Condyloid joint

33. Immovable joints are

a) Amphiarthroidial joints b) Arthrodial joints

c) ***Synarthroidial joints*** d) Diarthrodial joints

34. Olecranon process helps in the formation of

a) Gliding joint b) ***Hinge joint***

c) Pivot joint d) Ball and socket joint

35. The bone of upper arm of human is

a) Compact and flat bone b) ***Compact and long bone***

c) Sesamoid and irregular bone d) Sesamoid and short bone

36. Pick out the correct statement from the following

a) Both the movable and immovable joints have synovial fluid

b) Restricted movements are taking place by hip joint

c) ***Angular movement is seen between upper arm and fore arm***

d) The articular surfaces of a joint are made up of elastic cartilage

37. The movable joint without synovial capsule and synovial fluid is present

a) Pubic symphysis of pelvic girdle of males

b) ***Pubic symphysis of pelvic girdle of females***

c) Pubic symphysis of pectoral girdle of females

d) Pubic symphysis of pectoral girdle of males

38. The joint that lies between ethmoid bone and vomer exhibits the following

a) Bony projection fits into a socket of other

b) One bone slide over on the other bone

c) ***One bone fits into a slit in other bone***

d) One bone fixed in other bone with peg like elevation

39. Acetabulum forms

a) Ball for hip joint b) ***Socket of hip joint***

c) Ball for shoulder joint d) Socket of shoulder joint

40. Which of the following bones does not contain paranasal sinus in human being?

a) Ethmoid bone b) ***Vomer bone*** c) Nasal bone d) Sphenoid bone

41. The only movable bone in the skull is

a) ***Mandible*** b) Parietal c) Maxilla d) Vomer

42. The major component of vertebrate bone is

a) Calcium carbonate b) ***Calcium phosphate***

c) Magnesium phosphate d) Magnesium carbonate

43. Synsacrum and sacrum found respectively in

a) Mammals and birds b) Reptiles and mammals

c) ***Birds and mammals*** d) Mammals and reptiles

44. In mammals, the zygomatic arch is formed by

a) Maxilla b) Squamosal c) Jugal d) ***All the above***

45. Sella turcica that lodges pituitary gland is modified

a) Presphenoid b) Alisphenoid c) Orbitosphenoid d) ***Basisphenoid***

46. Knee joint is

a) ***Hinge joint*** b) Saddle joint

c) Condyloid joint d) Ball and socket joint

47. Cartilaginous joints are

a) Perfect joints b) ***Slightly movable joints***

c) Immovable joints d) Synovial joints

48. Which of the following is not a bone of skeleton of forelimb?

a) Humerus b) Radial c) Ulna d) ***Tibia***

49. Gorilla rib is

a) Extra abdominal rib b) Abdominal rib

c) ***Extra floating rib*** d) Extra true rib

50. Which of the following is true pertaining to a mammal?

a) All false ribs are floating ribs b) All floating ribs are true ribs

c) ***All true ribs are forked ribs*** d) All true ribs are floating ribs

51. **Assertion (A):** Even though the ATP content is very low in a skeletal muscle fibre, it is actively replenished continuously

Reason (R) : In the muscle fibres, the immediate additional source of energy namely Creatine.

Phosphate is present and it donates an energy rich phosphate group to ADP to form ATP

a) ***A & R are correct, and R is the correct explanation***

b) A & R are correct and R is not the correct explanation

c) A is correct, but R is incorrect

d) Both A & R are incorrect

52. **Assertion (A):** "Barefoot walking" in human being performed by the operation of second lever system

Reason (R) : In normal walking, the resistance (sole) is present between the fulcrums (toes) and effort (muscle of shank)

a) ***A & R are correct, and R is the correct explanation***

b) A & R are correct and R is not the correct explanation

c) A is correct, but R is incorrect

d) Both A & R are incorrect

53. **Assertion (A):** The increase in the concentration of calcium ions causes the conformational changes in the myosin that permits the binding of myosin to the thin filaments at the active site

Reason (R) : ATPase that present in the head of myosin is activated by calcium ions to develop hydrolysed ATP and ultimately results the formation of an active site in myosin filament to attach with thin filaments

a) A & R are correct, and R is the correct explanation

b) A & R are correct and R is not the correct explanation

c) ***A is correct, but R is incorrect***

d) Both A & R are incorrect

54. **Assertion (A):** Due to rapid activity of a muscle, the oxygen debt occurs in it

Reason (R) : Pyruvic acid gets accumulated in a muscle due to lack of oxygen in the medium

a) A & R are correct, and R is the correct explanation

b) A & R are correct and R is not the correct explanation

c) ***A is correct, but R is incorrect***

d) Both A & R are incorrect

55. **Assertion (A):** Synovial membrane secretes synovial fluid into synovial capsule of joint

Reason (R): Lubricants create free movement

a) ***A & R are correct, and R is the correct explanation***

b) A & R are correct and R is not the correct explanation

c) A is correct, but R is incorrect

d) Both A & R are incorrect

56. **Assertion (A):** No need of the presence of tubercular facet for 10^{th}-12^{th} thoracic vertebrae

Reason (R) : In rabbit, the ribs that associated with 10^{th}-12^{th} thoracic vertebrae are unforked

a) ***A & R are correct, and R is the correct explanation***

b) A & R are correct and R is not the correct explanation

c) A is correct, but R is incorrect

d) Both A & R are incorrect

57. Read the following and arrange them in a sequence with regard to the stimulation of muscle

A. Depolarization of cisternae

B. Depolarization of T-tubule

C. Release of Ca^{++} ions

D. Depolarization of sarcolemma

a) D-A-B-C b) D-C-B-A c) D-B-C-A d) ***D-B-A-C***

58. Read the following and choose the correct combinations

I. I-band is bisected by Z-line

II. The middle paler zone of A-band is H-zone

III. The centre of H-zone has M-line

IV. The part between two H-zones is a sarcomere

a) ***I, II and III*** b) II and III only c) III and IV only d) II, III and IV

59. Read the following and choose the correct combinations pertaining to rabbit

A. The smallest bone is found in internal ear

B. The longest bone is found in hind limb

C. The strongest bone is suprascapula

D. The longest tarsal is calcaneum

a) A and B b) ***B and D*** c) B and C d) A and C

60. The following are absent in adult rabbit

I. First metatarsal II. Entocuneiform

III. Hallux IV. Phalanges of 1st toe

a) I and II only b) II and III only c) III and IV only d) ***I, II, III and IV***

61. Read the following and choose the correct combinations

I. A myosin molecule is formed by six polypeptides

II. The essential light chain of neck is present towards the head

III. The regulatory light chain of neck is present towards the tail

IV. The heavy chains are wrapped around each other in tail region

a) I, II and III b) I, III and IV c) II, III and IV d) ***I, II, III and IV***

62. If 'F' is fulcrum, 'R' is resistance and 'M' is effort, match the following and choose the correct

List-I	List-II
A. First class leverage	I. 'F' between 'R' and 'M'
B. Second class leverage	II. 'M' between 'R' and 'F'
C. Third class leverage	III. 'R' between 'F' and 'M'

a) A-II, B-I, C-III b) ***A-I, B-III, C-II*** c) A-I, B-II, C-III d) A-II, B-III, C-I

63. Match the following and choose the correct answer

List-I	List-II
A. Ratchet mechanism	I. Accumulation of lactic acid
B. Phosphagen	II. Re synthesis & transport back of glycogen to muscle
C. Muscle fatigue	III. Immediate additional source of energy
D. Cori cycle	IV. Basis for sliding filament hypothesis

a) A-II, B-I, C-III, D-IV b) A-II, B-I, C-IV, D-III

c) ***A-IV, B-III, C-I, D-II*** d) A-II, B-IV, C-I, D-III

64. Match the following and choose the correct answer

List-I	List-II
A. T-tubule at A-I junction	I. Frog and snake
B. T-tubule in Z-line	II. Rabbit and Human
C. Much darker portion of A-band	III. Krause's membrane
D. Darker portion of I-band	IV. A-I junction

a) A-II, B-I, C-III, D-IV b) ***A-II, B-I, C-IV, D-III***

c) A-IV, B-III, C-I, D-II d) A-II, B-IV, C-I, D-III

65. Match the following in striated muscle

Column I	Column-II
A. Sarcosomes	p. Line at the center of H-zone
B. H-zone	q. S.R of muscle cell
C. Sarcomere	r. Space between two Z-lines
D. M-line	s. Mitochondria of muscle cell
	t. A light region of dark band

a) A-q, B-t, C-s and D-p

b) ***A-s, B-t, C-r and D-p***

c) A-r, B-t, C-p and D-s

d) A-s, B-t, C-p and D-q

66. Match the following and choose the correct answer

List-I	List-II
A. Fenestra rotunda	I. Thoracic rib
B. Tuberculum	II. Periotic
C. Acromial spine	III. Femur
D. Trochlea	IV. Scapula
E. Trochanter	V. Humerus

a) A-II, B-I, C-III, D-IV, E-V

b) ***A-II, B-I, C-IV, D-V, E-III***

c) A-IV, B-III, C-V, D-II, E-I

d) A-II, B-I, C-IV, D-III, E-V

67. Match the following and choose the correct answer

List-I	List-II
A. Amphiarthrosis and fibrous joint	I. Symphysis
B. Amphiarthrosis and cartilaginous joint	II. Syndesmosis
C. Synarthrosis and fibrous joints	III. Gomphosis
D. Synarthrosis and cartilaginous joint	IV. Synchondrosis

a) A-I, B-III, C-IV, D-II b) ***A-II, B- I, C-III, D-IV***

c) A-I, B-II, C-IV, D-III d) A-I, B-III, C-II, D-IV

68. Read the following and choose the correct combinations

Type of joint	Type of diarthrosis	Type of motion
I. Hinge	Monoaxial	Angular
II. Pivot	Monoaxial	Rotation
III. Saddle	Biaxial	Angular
IV. Condyloid	Biaxial	Angular

a) I and II b) I, II and III c) II, III and IV d) ***I, II, III and IV***

69. Study the following and choose the correct combinations

Segment/Capsule	Dorsal	Ventral	Lateral
I. Occipital	Exoccipital	Supraoccipital	Basioccipitals
II. Parietal	Parietals	Basisphenoid	Alisphenoids
III. Frontal	Frontals	Presphenoid	Orbitosphenoids
IV. Optic	Frontals	Parietals	Basihyals

a) III and IV b) I and III c) II and IV d) ***II and III***

70. Study the following about joints and choose the correct answer

Type	Movement	Example
I. Ball and socket	Free movement in more than one plane	Shoulder joint
II. Hinge	Two or more than two planes	Elbow joint
III. Pivot	Angular	Between C_1 and C_2 vertebrae
IV. Planar	Restricted movement in different planes	Between carpals

a) I and II b) ***I and IV*** c) II and III d) II and IV