

# Digestion and absorption

- Just as HCl is to pepsinogen, so is
  - Haemoglobin to oxygen
  - Enterokinase to trypsinogen
  - Bile juice to fat
  - Glucagon to glycogen.
- Match the following and choose the correct combination from the options given.

	Column I		Column II
P	ptyalin	(i)	Lipids
Q	Pepsin	(ii)	Starch
R	Steapsin	(iii)	DNA
S	Nuclease	(iv)	Protein

- P-(iii), Q-(ii), R-(iv), S-(iii) .
- P-(ii), Q-(iv), R-(i), S-(iii) .
- P-(iv), Q-(i), R-(iii), S-(ii) .
- P-(ii), Q-(iii), R-(i), S-(iv) .

- Maltase converts
  - Maltose to glucose at pH greater than 7.
  - Maltose to glucose at pH less than 7.
  - Maltose to alcohol.
  - Starch to maltose at pH higher than 7.
- Which of the following is not present in pancreatic juice?
  - Trypsinogen
  - Chymotrypsin
  - Pepsinogen
  - Lipase
- Lactose can be hydrolysed into
  - Glucose + Fructose
  - Fructose only
  - Glucose and Galactose
  - Glucose only
- Pick out the wrong enzymatic reaction
  - Sucrose + invertase  $\rightarrow$  glucose +fructose
  - Lactose + Lactase  $\rightarrow$  glucose +fructose
  - Pepsinogen + HCl  $\rightarrow$  Pepsin
  - Maltose + Maltase  $\rightarrow$ Glucose + Glucose
- Which of the following are proteolytic enzymes?
  - Ptyalin, trypsin, pepsin
  - Lipase, chymotrypsin, carboxypeptidase
  - Trypsin, carboxypeptidase, Pepsin

- (D) Pepsin, Nuclease, trypsin.
8. The layer lining lumen of human alimentary canal is  
 (A) Serosa  
 (B) Submucosa  
 (C) Muscularis  
 (D) Mucosa
9. Parietal cells secrete  
 (A) Pepsinogen  
 (B) Mucus  
 (C) Lysozymes  
 (D) HCl
10. Following is the scheme showing digestion of carbohydrates. Identify the enzymes-a,b,c and d.  
 (A) (a) –amylase,(b)- maltase, (c) –lactase , (d) – invertase.  
 (B) (a) –amylase,(b)- maltase, (c) –invertase, (d) – lactase.  
 (C) (a) –amylase,(b)- invertase, (c) -maltase ,(d) – lactase.  
 (D) (a) –amylase,(b)- lactase , (c) –maltase, (d) – invertase.

11. A child took sugarcane and sucked its juice.Regarding this which of the following match is correct?

	substrate	enzyme	Site of secretion of enzyme	Product formed
(A)	proteins	Pepsin	Duodenum	Polypeptides
(B)	Starch	Amylase	Salivary amylase	Glucose
(C)	Lipids	Lipase	Pancreas	Fat goblets
(D)	Sucrose	Invertase	Duodenum	Glucose + Fructose

12. Number of milk teeth found in human is  
 (A) 32 (B) 20 (C) 52 (D) 12
13. Oxyntic cells are located in  
 (A) Islets of langerhans and secrete insulin  
 (B) Kidneys and secrete rennin  
 (C) Gastric epithelium and secrete HCl  
 (D) Gastric epithelium and secrete Pepsin
14. Ilium is  
 (A) First part of the small intestine  
 (B) Middle part of the intestine  
 (C) Last part of the small intestine  
 (D) Not a part of the small intestine
15. A bolus is  
 (A) A mass of crushed food moistened with saliva  
 (B) The semisolid material resulting from partial digestion in the stomach  
 (C) The milky emulsified fat absorbed from small intestine  
 (D) Indigestible material that help in movement and absorption
16. If you chew a piece of bread long enough,it will begin to taste sweet because  
 (A) Maltase is breaking down maltose  
 (B) Lipase are forming fatty acids  
 (C) Amylase is breaking down starch to disaccharides  
 (D) Disaccharides are forming glucose
17. Which of the following region of the alimentary canal of man does not secrete a digestive enzyme?  
 (A) Oesophagus (B) Stomach (C) Duodenum (D) Mouth

18. Rennin acts on
- (A) Milk changing casein into calcium paracaseinate at 7.2 -8.0 pH
  - (B) Fat in intestine
  - (C) Proteins in small intestine
  - (D) Milk changing casein into calcium paracaseinate at 1-3 pH
19. Digestion of starch takes place in
- (A) Stomach and Duodenum
  - (B) (B) Buccal cavity and duodenum
  - (C) Duodenum only
  - (D) Buccal cavity and oesophagus only
20. Trypsin is enzyme ,which digests
- (A) Proteins in duodenum in acidic medium
  - (B) Proteins in stomach in alkaline medium
  - (C) Proteins in duodenum in alkaline medium
  - (D) Proteins in stomach in acidic medium

# Breathing and respiration

- Mark the true statement among the following with reference to normal breathing
  - Inspiration is a passive process whereas expiration is active
  - Inspiration is an active process where as expiration is passive
  - Inspiration and expiration are active processes
  - Inspiration and expiration are passive processes
- A person breaths in some volume of air by forced inspiration after having a forced expiration . This quantity of air taken in is
  - Total lung capacity
  - Tidal volume
  - Vital capacity
  - Inspiratory capacity
- CO<sub>2</sub> dissociates from carbaminohaemoglobin when
  - pCO<sub>2</sub> is high and pO<sub>2</sub> is low
  - pCO<sub>2</sub> is high and pCO<sub>2</sub> is low
  - pCO<sub>2</sub> and pO<sub>2</sub> are equal
  - None of the above
- About 1000 ml of air is always known to remain inside human lungs. It is described as
  - Residual volume
  - Tidal volume
  - Inspiratory reserve volume
  - Expiratory reserve volume
- Under a given O<sub>2</sub> concentration in blood , the dissociation of the oxyhaemoglobin will increase if
  - pH of blood rises
  - pH of blood falls
  - CO<sub>2</sub> concentration of blood falls
  - Free fatty acid concentration in blood falls
- Match the items in column I with column II and choose the options .

	Column I		ColumnII
1	Tidal volume	a	2500 3000 ml of air
2	Inspiratory reserve volume	b	1000 ml of air
3	Expiratory reserve volume	c	500 ml of air
4	Residual volume	d	3400 to 4800 ml of air
5	Vital capacity	e	1200 ml of air

- 1--c, 2--d, 3--b, 4--a ,5--e
  - 1--c, 2--a,3--b, 4--e, 5--d
  - 1--c, 2--a, 3--d, 4--e, 5--d,
  - 1--e , 2--d , 3--b, 4--a, 5--b
- Which of the following increases area of thoracic cavity during inhalation ?
    - Inward and upward movement of rib cage
    - Outward and downward movement of rib cage
    - Outward and upward movement of rib cage

- (D) Inward and downward movement of rib cage
8. According to Boyle's Law, the product of pressure and volume is constant. Hence,
- (A) If volume of lungs is increased, the pressure decreases proportionately
  - (B) If volume of lungs is increased, the pressure also increases proportionately
  - (C) If volume of lungs is increased, the pressure decreases disproportionately
  - (D) If volume of lungs is increased, the pressure remains the same
9. The partial pressure of oxygen in alveolar air is :
- (A) 45mmHg
  - (B) 125 mm Hg
  - (C) 110 mm Hg
  - (D) 104 mm Hg
10. Oxygen binding to haemoglobin is
- (A) Directly proportional to CO<sub>2</sub> concentration
  - (B) Directly proportional to CO concentration
  - (C) Inversely proportional to CO<sub>2</sub> concentration
  - (D) Independent of CO concentration
11. Which of the following is a possibility for most of us in regard to breathing, by making conscious effort
- (A) One can breathe out air totally without oxygen
  - (B) One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the rib at all.
  - (C) One can breathe out air through eustachian tube by closing both nostrils and mouth
  - (D) The lungs can be made fully empty by forceful breathing out all air from them.
12. Air is breathed through
- (A) trachea → lungs → larynx → pharynx → alveoli
  - (B) nose → larynx → pharynx → bronchus → alveoli → bronchioles
  - (C) Nostrils → pharynx → larynx → trachea → bronchi → bronchioles → alveoli
  - (D) Nose → mouth → lungs
13. Which of the following events take place during inspiration in man?
- (A) The internal intercostal muscles relax
  - (B) Due to contraction of external intercostal muscles, and flattening of diaphragm the volume of thoracic cavity decreases
  - (C) Due to contraction of external intercostal muscles, and flattening of diaphragm the volume of thoracic cavity increases
  - (D) Due to contraction of external intercostal muscles, and flattening of diaphragm the volume of thoracic cavity increases
  - (E) The abdominal muscles contract
14. All of the following can bind to haemoglobin except
- (A) HCO<sub>3</sub><sup>-</sup>
  - (B) O<sub>2</sub>
  - (C) H<sup>+</sup>
  - (D) CO<sub>2</sub>
15. About 23% of CO<sub>2</sub> is transported as
- (A) Carbamino compounds
  - (B) Bicarbonates of Na and K
  - (C) Carboxyhaemoglobin
  - (D) Oxyhaemoglobin
16. A molecule of haemoglobin carries \_\_\_\_\_ oxygen molecules
- (A) 1 (B) 2 (C) 3 (D) 4

17. Each lung is enclosed in two membranes called pleura. The membrane , which closely covers the lungs , is called:
- (A) Parietal pleura
  - (B) Visceral pleura
  - (C) Peritoneum pleura
  - (D) Lung pleura
18. When diaphragm of man is completely dome shaped, it shows,
- (A) End of expiration and beginning of inspiration
  - (B) Beginning of expiration and end of inspiration
  - (C) Increased rate of breathing
  - (D) Decreased rate of breathing
19. Gases diffuse over the respiratory surface because of
- (A)  $pO_2$  is more in alveoli than in blood
  - (B)  $pO_2$  is more in alveoli than in tissues
  - (C)  $pCO_2$  is more in alveoli than in blood
  - (D)  $pCO_2$  is more in alveoli than in tissues
20. which type of respiratory organs are present in spider and scorpions?
- (A) Book lungs
  - (B) Gills books
  - (C) Gills
  - (D) Lungs .

# Locomotion and movement

- Functional unit of skeletal muscle is called  
(A) Sarcomere (B) twitch (C) Z—band (D) Sarcoplasm
- Passage of ova through female reproductive tract is facilitated by  
(A) Amoeboid movement  
(B) Muscular movement  
(C) Ciliary movement  
(D) Sliding movement
- In myofibrils, light band containing actin is called  
(A) Z—line (B) A--- band (C) I---- band (D) H-zone
- In myofibril,the term sarcomere refers to the distance between  
(A) Two I bands  
(B) Two Z bands  
(C) Z and A bands  
(D) A and I bands
- Major protein in thick filaments of skeletal muscle fiber is  
(A) Myosin (B) Actin (C) Tropomyosin (D) Troponin
- During muscular contraction the events occur
  - H—zone disappear
  - A-band widens
  - I band reduces in width
  - Width of A band is unaffected
  - M-line and Z-line come closer

(A) i , ii, and v (B) i ,ii and iii (C) i ,iii ,iv and v (D) ii ,iv and v

- Match the items in column I with column II and choose the correct options .

	Column I		ColumnII
a	Ball and socket	1	Carpel and metacarpal of thumb
b	Hinge	2	Atlas and Axis
c	Pivot	3	Frontal and Parietal
d	Saddle	4	Knee
e		5	Humerus and pectoral girdle

- a —5, b—4, c—2, d—1
  - a —1, b—2, c—5, d—4
  - a —1, b—2, c—5, d—4
  - a —5, b—4, c—2, d—1
- progressive degeneration of skeletal muscles, mostly due to genetic disorder occurs in  
(A) Myasthenia gravis  
(B) Muscular dystrophy  
(C) Arthritis  
(D) Osteoporosis
  - Which one of the following is showing the correct sequential order of the vertebral column of human being?  
(A) Cervical – lumbar—thoracic --- sacral--- coccygeal  
(B) Cervical – thoracic —sacral --- lumbar --- coccygeal

- (C) Cervical – sacral —thoracic --- lumbar l--- coccygeal  
(D) Cervical – thoracic —lumbar --- scaral--- coccygeal
10. Muscles with characteristic striations and involuntary nature are  
(A) Muscles in the wall of alimentary canal  
(B) Muscles of heart  
(C) Skeletal muscles  
(D) Muscles of eye lids
11. Human cranium has  
(A) 8 bones (B) 14 bones (C) 20 bones (D) 30 bones
12. Cervical vertebrae are located in  
(A) Thoracic region (B) abdominal region (C) neck region (D) lumbar region
13. Axial skeleton in man is made up of  
(A) 126 bones (B) 22 bones (C) 30 bones (D) 80 bones
14. In ball and socket joint the friction of two bones is lessened by  
(A) Mucin (B) Pericardial fluid (C) Coelomic fluid (D) Synovial fluid
15. The neurotransmitter between a motor neuron and a muscle cell is  
(A) Serotonin (B) Endorphin (C) dopamine (D) Acetylcholine
16. A—band of striated muscle fibre is composed of  
(A) Actin molecule (B) overlapping actin and myosin molecules (C) myosin molecules (D) none of the above
17. The ear ossicle of man are arranged in the following order starting from ear drum inwards  
(A) Malleus , Incus , Stapes  
(B) Malles , Stapes , Incus  
(C) Incus , malleus , Stapes  
(D) Stapes ,malleus, incus
18. The joints between bones of human skull is  
(A) Hinge joint  
(B) Synovial joint  
(C) Cartilaginous joint  
(D) Fibrous joint
19. During contraction and relaxation of striated muscle fibre the length of A band  
(A) Increases (B) remains same and does not change (C) decreases (D) none of the above
20. Contraction of muscle results in  
(A) A contraction of myosin molecule  
(B) The sliding of the actin and myosin filaments in to each other  
(C) The formation of peptide bond that link actin and myosin  
(D) Contraction of actin molecule .

# Neural control and coordination

- Potential difference across resting membrane is negatively charged. This is due to differential distribution of the following ions
  - Na<sup>+</sup> and K<sup>+</sup> ions
  - CO<sub>3</sub><sup>++</sup> and Cl<sup>-</sup> ions
  - Ca<sup>++</sup> and Mg<sup>++</sup> ions
  - Ca<sup>++</sup> and Cl<sup>-</sup> ions
- In the resting stage of neural membrane, diffusion due to concentration gradients, if allowed would drive
  - K<sup>+</sup> in to the cell
  - K<sup>+</sup> and Na<sup>+</sup> out of the cell
  - Na<sup>+</sup> in to the cell
  - Na<sup>+</sup> out of the cell
- Unidirectional transmission of a nerve impulse through nerve fibre is due to the fact that
  - Nerve fibre is insulated by a medullary sheath
  - Sodium pump starts operating only at the cyton and then continues in to the nerve fibre
  - Neurotransmitter are released by dendrites and not by axon endings
  - Neurotransmitter are released by the axon endings and not by dendrites
- Nerve impulse is generated when nerve cell undergoes
  - Hyperpolarisation
  - Depolarisation
  - Pseudopolarisation
  - Repolarisation
- Depolarisation of neuron involves
  - Influx of K<sup>+</sup>
  - influx of Na<sup>+</sup>
  - efflux of Na<sup>+</sup>
  - influx of Ca<sup>2+</sup> and Cl<sup>-</sup>
- the primary function of myelinated sheath around a vertebrate axon is to
  - regulate Na<sup>+</sup>-K<sup>+</sup> pump
  - increase size of action potential
  - increase the speed of conduction by preventing leakage of nerve impulse
  - deactivate the release of neurotransmitters
- a typical value of resting membrane potential is
  - 40 volts
  - 60 volts
  - 70 volts
  - 80 volts
- These processes occur during re-polarisation of nerve fibre
  - Open Na<sup>+</sup> channel
  - Closed Na<sup>+</sup> channel
  - Closed K<sup>+</sup> channel
  - Open K<sup>+</sup> channel
  - (ii) and (iii)
  - (i) and (ii)
  - (ii) and (iv)
  - (i) and (iii)
- During repolarisation of nerve
  - Na<sup>+</sup> channel are closed and K<sup>+</sup> channels are open
  - K<sup>+</sup> gate closes and Na<sup>+</sup> gate opens
  - Both gates remain open
  - Both K<sup>+</sup> and Na<sup>+</sup> gates are closed

10. An action potential in nerve fibre is produced when positive and negative charges on the outside and inside of the axon membrane are reversed, because
- (A) More sodium ions enter the axon as compared to potassium ions leaving it
  - (B) More potassium ions enter the axon as compared to sodium ions leaving it
  - (C) All potassium ions leave the axon
  - (D) All sodium ions enter the axon
11. When neuron is in resting state , i.e, not conducting any impulse, the axon membrane is
- (A) Impermeable to both  $\text{Na}^+$  and  $\text{K}^+$  ions
  - (B) Comparatively more permeable to  $\text{K}^+$  ions and nearly impermeable to  $\text{Na}^+$  ions
  - (C) Comparatively more permeable to  $\text{Na}^+$  ions and nearly impermeable to  $\text{K}^+$  ions
  - (D) Equally permeable to both  $\text{Na}^+$  and  $\text{K}^+$  ions
12. An area of brain which is associated with strong emotions is
- (A) Cerebral cortex
  - (B) Cerebellum
  - (C) Limbic system
  - (D) Medulla
13. Human eyeball consists of three layers and it encloses
- (A) lense, iris, optic nerve
  - (B) lense , aqueous humor and virteous humor
  - (C) cornea, lense, Iris
  - (D) cornea, lense, optic nerve

14. Match the items in column I with column II and choose the correct options .

	Column I		ColumnII
a	Cerebrum	1	Controls the pituitary
b	Cerebellum	2	Controls vision and hearing
c	Hypothalamus	3	Controls the rate of heart beat
d	Mid brain	4	Seat of intelligence
e		5	Maintains body posture

- (A) a —5, b—4, c—2, d—1
- (B) a —1, b—2, c—5, d—4
- (C) a —1, b—2, c—5, d—4
- (D) a —4, b—5, c—1, d—2

15. Corpus callosum connects

- (A) two cerebral hemisphere
- (B) two cerebellar hemisphere
- (C) Medulla and cerebellum
- (D) Pons and cerebellum

16. Motor neuron of a reflex arc carriers impulse from

- (A) Receptor to CNS
- (B) CNS to receptor
- (C) Effector to CNS
- (D) CNS to effector

17. The decoding and interpretation of visual information is carried out by which part of the brain ?

- (A) Frontal lobe
- (B) parietal lobe
- (C) Occipital lobe
- (D) temporal lobe

18. the amount of light falling on the eyes is controlled by

- (A) lense capsule
- (B) Ciliary body
- (C) iris
- (D) Cornea

19. Cochlea of mammalian internal ear is connected with

- (A) Balance of boy posture
- (B) Both balance and hearing
- (C) Hearing
- (D) Perception of atmospheric pressure

20. H shaped grey matter is found in

- (A) Spinal cord
- (B) Cerebellum
- (C) Cerebrum
- (D) Medulla

21. Nerve impulse for hearing originates from

- (A) Ear drum
- (B) Cochlea
- (C) Auditory nerve
- (D) Ear ossicles