



Mahavir Senior Model School
Subject : Biology
Class : XI C
Topic: Human Physiology
COMPETENCY BASED QUESTIONS
(Multiple Choice Questions)

Q.1 A man respire about
(a) 40-42 times per minute
(b) 72-74 times per minute
(c) 12-16 times per minute
(d) 100 times per minute

Q.2 In man, gaseous exchange between the environment and the body takes place in
(a) Bronchi (c) Alveoli
(b) Larynx (d) Trachea

Q.3 Inspiration would not occur if the
(a) Diaphragm is elevated
(b) Diaphragm is lowered
(c) Ribs are elevated
(d) Ribs are elevated and diaphragm is lowered

Q.4 Ventricular systole is stimulated by
(a) S-A node (c) A-V node
(b) A-V aperture (d) A-V valve

Q.5 The sound dupp in heart is produced by
(a) Closure of semilunar valves (c) Opening of A-V Valves
(b) Closure of A-V valves (d) Opening of semilunar valves

Q.6 Blood and lymph differ in
(a) Blood has cells while lymph is without cells
(b) Blood has RBCs which are absent in lymph
(c) Blood has several inorganic substances which are absent in lymph
(d) Blood has WBCs which are absent in lymph

Q.7 Blood coming out of liver has high concentration of

- (a) Urea
- (b) Protein
- (c) Erythrocytes
- (d) Oxygen.

Q.8 In glycosuria, urine contains

- (a) Glucose
- (b) Inorganic ions
- (c) Amino acids
- (d) Epithelial cells.

Q.9 The plasma resembles in its composition with the filtrate produced in glomerulus except for the presence of

- (a) Amino acids
- (b) Glucose
- (c) Chlorides
- (d) Proteins.

Q.10 Human skull is

- (a) Tricondylic
- (b) Acondylic
- (c) Dicondylic
- (d) Monocondylic

Q.11 Total number of cervical vertebrae in human vertebral column are

- (a) 3
- (b) 5.
- (c) 7
- (d) 12

Q.12 Acetabulum is a part of

- (a) Humerus bone
- (b) Pelvic girdle
- (c) Femur bone
- (d) Pectoral girdle

Q.13 Outer most covering of brain is

- (a) Pia mater
- (b) White matter
- (c) Arachnoid
- (d) Dura mater

Q.14 Synapse is a close proximity of

- (a) Two veins
- (b) Two lymphatics
- (c) Two neurons
- (d) Two arteries

Q.15 Hormone produced during emotional stress is

- (a) Adrenaline
- (b) Melatonin
- (c) Calcitonin
- (d) Norepinephrine

Mahavir Senior Model School
Subject : Biology
Class : XI C
Topic: Human Physiology
COMPETENCY BASED QUESTIONS
(Assertion-Reason Type)

Given below are two statements labelled as Assertion (A) and Reason (R).

Select the most appropriate answer from the options given below:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true and R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

1.Assertion (A): Emphysema is caused by dust accumulation in lungs.

Reason (R): It causes a shortening of breath and decreases respiratory surface.

2.Assertion (A): Residual volume is the retained air in the lungs.

Reason (R):Even after forceful expiration, some volume of air remains inside the lung.

3.Assertion (A): The human heart is called myogenic.

Reason (R): Normal activities of the heart are regulated intrinsically, i.e. auto-regulated by specialised muscles.

4. Assertion (A): Blood pumped by the right ventricle enters the pulmonary artery.

Reason (R): Pulmonary artery carries oxygenated blood to the lungs.

5.Assertion (A): The vasa recta is not present or highly diminished in cortical nephrons.

Reason (R): The main concern of cortical nephrons is urine concentration.

6.Assertion (A): Birds and insects are uricotelic animals.

Reason (B):Comparative to uric acid, urea is a more toxic excretory substance.

7.Assertion (A): Ball and socket joint is an immovable Synovial joint.

Reason (R): Presence of synovial fluid makes a joint freely movable.

8.Assertion (A): The Ca^{2+} ions play a crucial role in muscle contraction.

Reason (R): The Ca^{2+} ions bind troponin causing the displacement of tropomyosin, allowing the myosin head to bind actin.

9.Assertion (A): The last two pairs of ribs are floating ribs.

Reason (R): They float in the abdominal fluid.

10.Assertion (A): Inflammation of a skeletal joint may immobilise the movement of joints.

Reason (R): Uric acid crystals in the joint cavity and ossification of articular cartilage leads to this condition.

11.Assertion (A): Adrenaline and noradrenaline are called emergency hormones.

Reason (R): These hormones increase alertness, pupillary dilation and piloerection.

12.Assertion (A): The PNS comprises all the nerves of the body associated with CNS.

Reason (R): PNS is the site of information processing and control.

MSMS

Mahavir Senior Model School
Subject : Biology
Class : XI C
Topic: Human Physiology
COMPETENCY BASED QUESTIONS
(Case Based Questions)

Case 1. Each muscle fibre has a sarcolemma, which surrounds the sarcoplasm. Because the sarcoplasm includes several nuclei, muscle fibre is a syncytium. The sarcoplasm also contains sarcoplasmic reticulum, which is a calcium ion storage compartment. The sarcoplasmic reticulum (SR) can be functionally defined as a specialised form of the endoplasmic reticulum (ER) dedicated to Ca^{2+} storage and release with respect to regulation of muscle contraction. The first studies showing the convoluted structure of the SR and the associated T-tubule system go back to the beginning of the 20th century when Veratti described a complex network of membrane structures, characterised by longitudinal tubules interconnected with large cisternae. The real structure of the SR was, however, fully appreciated only half a century later, following electron microscopy studies by Porter and Palade.

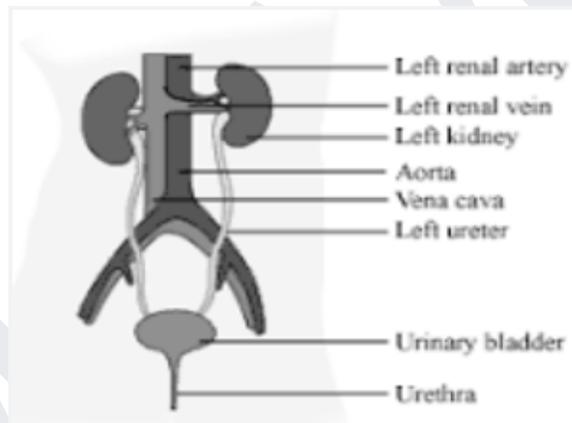
- (A) Describe the role of calcium with regard to the changes in myofibril bands?
- (B) What happens to the cross-bridge in a muscle fibre after ATP binding?
- (C) Sarcolemma, sarcoplasm and sarcoplasmic reticulum are all different names for the parts of muscle. Which parts of the muscle do these names refer to?
- (D) Draw a neat and well labelled diagram of sarcomere.

Case 2. The use of blood in forensic analysis is a method for identifying individuals suspected of committing some kind of crime. Paul Uhlenhuth and Karl Landsteiner, two scientists working separately in Germany in the early twentieth century, showed that there are differences in blood between individuals. Uhlenhuth developed a technique to identify the existence of antibodies, and Landsteiner and his students showed that humans had distinctly different blood types called A, B, AB, and O. Once doctors differentiated blood into distinct types, they could use that information to safely perform blood transfusions. Furthermore, forensic scientists can use that information to exculpate people suspected of some types of crimes, and they can use it to help

determine the paternity of children. When scientists identify blood types, they rely on slight differences in the antigens or protein markers on the surfaces of red blood cells in a blood sample. In a body, those antigens are recognized and attached to by antibodies.

- (A) Name the four blood groups found in humans.
- (B) Name the blood group that acts as universal donors.
- (C) Which blood group is a universal acceptor? Where are antigens present?
- (D) Why blood has to be matched before transfusion.

Case3 The excretory system is a vital biological system that helps remove waste from the body and maintain internal chemical balance. It's made up of several organs that perform a number of important functions, including Removing metabolic waste, extra salt, and water from the body, helps regulate blood pressure and volume, helps control levels of electrolytes in the body, It releases the hormone erythropoietin, which regulates the production of red blood cells, Maintaining fluid balance etc. Observe the diagram given below and answer the questions :



- (A) Which blood vessel carries nitrogenous wastes ?
- (B) Which blood vessel carries deoxygenated blood from the left kidney ?
- (C) How the urine formed gets concentrated more than the initial filtrate.
- (D) Differentiate between cortical and juxtamedullary nephrons.