1. Even when there is no air in it, human trachea does not collapse due to presence of -

(a) Bony rings (b) Turgid pressure
(c) Chitinous rings (d) Cartilaginous rings

2. Oxygen carried in inhalation ultimately reaches -

(a) Bronchioles (b) Bronchus
(c) Trachea (d) Alveoli

3. Which one of the following statements is incorrect ?

A. Trachea divides at the level of 5th thoracic vertebra into a right and left primary bronchi.
B. Initial bronchioles are supported by complete cartilaginous rings.
C. Each terminal bronchiole gives rise to a number of very thin, irregular walled and vascularised bag-like structure called bronchi.
D. Larynx is a cartilaginous box which help in sound production and hence called the sound box.
(a) A only (b) (B) and (C) only
(c) A, D and C (d) B, C and D

4. In a mammalian lungs, the rate at which oxygen could be obtained from the air would increase, if -

(a) Tidal volume decreases
(b) The cells lining the alveoli and capillaries were thinner
(c) Blood haemoglobin content were lower
(d) You ascend to a higher altitude

5. Which of the following produces negative pressure in your thoracic cavity ?

(a) Exhalation
(b) Contraction of diaphragm muscles
(c) Relaxation of the muscles between the ribs
(d) Contraction of the muscles in the walls of stomach

6. Match the following and mark the correct options.

Animal	**Respiratory Organ**
A. Earthworm	i. Moist cuticle
B. Terrestrial Arthropods	ii. Gills
C. Fishes	iii. Lungs
D. Birds / Reptiles	iv. Trachea

(a) A-ii, B-i, C-iv, D-iii (b) A-i, B-iv, C-ii, D-iii
(c) A-i, B-iii, C-ii, D-iv (d) A-i, B-ii, C-iv, D-iii

7. The epithelial tissue present on the inner surface of bronchioles and fallopian tubes is -

(a) Glandular (b) Ciliated
(c) Squamous (d) Cuboidal

8. Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls -

(a) Emphysema (b) Pneumonia
(c) Asthma (d) Pleurisy

9. Respiration is controlled by

(a) Medulla oblongata (b) Cerebellum
(c) Hypothalamus (d) Cerebrum

10. Wall of alveoli is composed of

(a) Simple squamous epithelium (b) Simple cuboidal epithelium
(c) Pseudostratified epithelium (d) Simple columnar epithelium

11. The combination of oxygen with haemoglobin is called

(a) Oxidation (b) Oxygenation
(c) Reduction (d) None of the above

12. Carbonic anhydrase is found in

(a) WBC (b) RBC
(c) Blood plasma (d) All

13. Which is a common passage for food and air?

(a) Trachea (b) Oesophagus
(c) Pharynx (d) Glottis

14. Which muscles contract during normal expiration

A–Diaphragm
B–EICM
C–IICM
D–Abdominal muscles
(a) A and B
(b) C and D
(c) A and C
(d) No muscles contract during expiration

15. Binding of oxygen with haemoglobin is primarily related to -

(a) Partial pressure of O_2 (b) Partial pressure of CO_2
(c) H^+ ion concentration (d) Temperature

16. Number of RBCs per unit volume of blood is likely to be higher in a person residing at high altitudes, because :

(a) Air is clean and unpolluted (b) More sun shine is available
(c) Air is less dense (d) Vegetation gives out more O_2

17. Process of exchange of O_2 from the atmosphere with CO_2 produced by the cells is called
(a) breathing (b) respiration
(c) Both (a) and (b) (d) exhalation

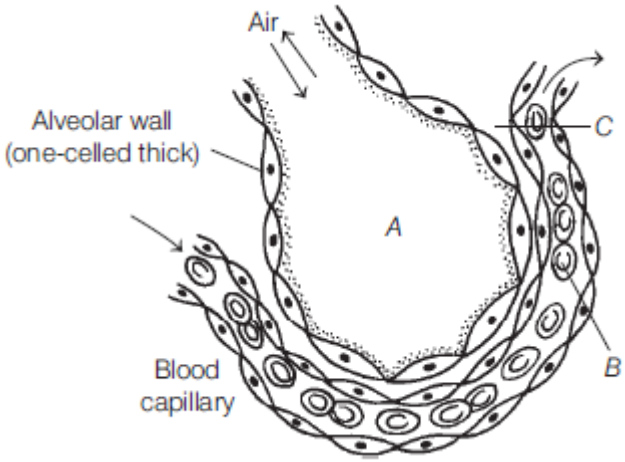
18. Bronchioles are formed by
(a) protoplasmic extension of trachea
(b) structural modification of pleural membrane
(c) repeated division of bronchi
(d) calcification of pleural membrane

19. In humans, which of the following is not a step in respiration?
(a) Alveolar diffusion of O_2 and CO_2
(b) Transport of gases by blood
(c) Diffusion of O_2 and CO_2 between blood and tissues
(d) Utilisation of CO_2 by cells for catabolic reactions

20. Additional volume of air, a person can inspire and expire by forcible inspiration and expiration, respectively is called
(a) TV (b) IRV and ERV
(c) IC and EC (d) FRC

21. Which vein contains the oxygenated blood in humans?
(a) Cardiac vein (b) Hepatopancreatic
(c) Portal vein (d) Pulmonary vein

22. Identify *A*, *B* and *C* in the given diagram and choose the correct option accordingly.



(a) A–Alveolar cavity, B–WBC, C–Capillary wall
(b) A–Alveolar cavity, B–RBC, C–Systemic wall
(c) A–Alveolar cavity, B–RBC, C–Basement membrane
(d) A–Alveolar cavity, B–WBC, C–Systemic wall

23. The shape of oxygen dissociation curve plotted between % saturation of Hb with O_2 and pO_2 is
(a) sigmoid
(b) J-shaped
(c) exponential, consisting of three phases
(d) hyperbolic

24. People who have migrated from the planes to an area adjoining Rohtang pass about six months back ***CBSE-AIPMT 2012***
(a) have more RBCs and their haemoglobin has a lower binding affinity to O_2
(b) are not physically fit to play games like football
(c) suffer from altitude sickness with symptoms like nausea, fatigue, etc
(d) have the usual RBC count but their haemoglobin has very high binding affinity to O_2

25. A chemosensitive area found adjacent to the rhythm centre in the brain is highly sensitive to the ncreased concentration of
(a) CO2 (b) O2
(c) H+ (d) Both (a) and (c)

26. Due to increasing airborne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to ***NEET (National) 2019***
(a) inflammation of bronchi and bronchioles
(b) proliferation of fibrous tissues and damage of the alveolar walls
(c) reduction in the secretion of surfactants by pneumocytes
(d) benign growth on mucous lining of nasal cavity

27. Occupational respiratory disorders can be prevented by
(a) the intake of antihistamine tablets daily
(b) avoid areas with increased levels of dust and smoke areas
(c) wearing protective masks
(d) All of the above

28. Mark the true statement among the following with reference to normal breathing.
(a) Inspiration is a passive process whereas expiration is active
(b) Inspiration is an active process whereas expiration is passive
(c) Inspiration and expiration are active processes
(d) Inspiration and expiration are passive processes

29. In breathing movements, air volume can be estimated by
(a) stethoscope (b) hygrometer
(c) sphygmomanometer (d) spirometer

30. Match the following columns.

	Column I		Coulmn II
A.	Earthworm	1.	Moist cuticle
B.	Aquatic arthropods	2.	Gills
C.	Fishes	3.	Lungs
D.	Birds/reptiles	4.	Trachea

Codes

	A	B	C	D		A	B	C	D
(a)	2	1	4	3	(b)	1	4	2	3
(c)	1	3	2	4	(d)	1	2	4	3

1. (d)
2. (d)
3. (b)
4. (b)
5. (b)
6. (b)
7. (b)
8. (a)
9. (a)
10. (a)
11. (b)
12. (b)
13. (c)
14. (d)
15. (a)
16. (c)
17. (*c*) The process of exchange of oxygen from the atmosphere with carbon dioxide produced by the cells is called breathing, commonly known as respiration.

18. (c)
19. (*d*) Option (d) is not a step of respiration. In humans, respiration involves following steps

l Breathing or pulmonary ventilation by which atmospheric air is drawn in and CO2 rich alveolar air is released out.
l Diffusion of gases (O2 and CO2) acrosses alveolar membrane.
l Transport of gases by the blood.
l Diffusion of O2 and CO2 between blood and tissue.
l Utilisation of O2 by the cells for catabolic reactions and release of CO2.

20. (b)
21. (*d*) Pulmonary vein is the only vein in body, which carries oxygenated blood rather than deoxygenated blood. It carries the blood from the lungs to the left auricle of heart. From left auricle, blood goes to the left ventricle, which then distributes that blood all over the body.

22. (c)
23. (*a*) Oxygen haemoglobin dissociation curve is sigmoid-shaped. The relationship between the *p*O2 and the per cent saturation of haemoglobin when represented on a graph is termed as oxygen haemoglobin dissociation curve. The *p*O2 in the arterial blood is about 95 mm Hg and the per cent saturation of haemoglobin at this partial pressure is 97%. 100% saturation of haemoglobin with O2 takes place at *p*O2 of 140 mm Hg.

24. (*a*) As a person moves up a hill, the *p*O2 and total atmospheric pressure decreases. It stimulates the juxta glomerular cells of kidney to secrete erythropoietin hormone which increases the number of RBCs (polycythemia) to compensate the supply of O2. Thus, the people who have migrated from planes to Rohtang pass will have more RBCs. At higher altitude, haemoglobin has lower binding affinity to O2 because the primary factor responsible for binding is *p*O2 which decreases at higher altitude.
25. (d)
26. (*a*) Wheezing occurs due to the inflammation of bronchi and bronchioles. It is one of the most significant feature of asthma in which people face difficulty in breathing. It is usually caused due to increasing airborne allergens and pollutants. The allergens stimulate the release of histamine from the mast cells which in turn contract the smooth muscles of bronchioles.

27. (d)
28. (*b*) Inspiration is an active process whereas expiration is a passive process because inspiration occurs when the muscles of diaphragm contract by using energy to increase the overall volume of thoracic cavity. Whereas, during the expiration diaphragm

muscles relax without the use of energy as there is high intrapulmonary pressure than the atmospheric pressure, thus the air rushes out. Thus, it is a passive process.

29. (*d*) Spirometer is the device used to measure the volume of air involved in breathing movements and it also helps in clinical assessment of pulmonary functions.

30. (b)