



# BIOLOGY

## BOOKS - PRADEEP BIOLOGY (HINGLISH)

### BREATHING AND EXCHANGE OF GASES

**Ncert Exercise With Answers**

1. Define vital capacity. What is its significance?



**Watch Video Solution**

2. State the volume of air remaining in the lungs after a normal breathing.



[Watch Video Solution](#)

3. Diffusion of gases occurs in the alveolar region only and not in the other parts of respiratory system. Why?



[Watch Video Solution](#)

4. What are the major transport mechanisms for  $CO_2$ ? Explain.



Watch Video Solution

5. What will be the  $pO_2$  and  $pCO_2$  in the atmospheric air compared to those in the alveolar air?

- (i)  $pO_2$  lesser,  $pCO_2$  higher
- (ii)  $pO_2$  higher,  $pCO_2$  lesser
- (iii)  $pO_2$  higher,  $pCO_2$  higher
- (iv)  $pO_2$  lesser,  $pCO_2$  lesser



**Watch Video Solution**

6. Explain the process of inspiration under normal conditions.



**Watch Video Solution**

7. HOW RESPIRATION IS REGULATED?



**Watch Video Solution**

8. What is the effect of  $pCO_2$  on oxygen transport?



[Watch Video Solution](#)

9. What happens to the respiratory process in a man going up a hill?



[Watch Video Solution](#)

**10.** What is the site of gaseous exchange in an insect?



**Watch Video Solution**

**11.** Define oxygen dissociation curve. Can you suggest any reason for its sigmoidal pattern?



**Watch Video Solution**

**12.** Have you heard about hypoxia? Try to gather information about it, and discuss with your friends.



**Watch Video Solution**

**13.** Distinguish between

(a) IRV and ERV

(b) Inspiratory capacity and Expiratory capacity

(c) Vital capacity and Total lung capacity



**Watch Video Solution**

**14.** What is Tidal volume? Find out the Tidal volume (approximate value) for a healthy human in an hour.



**Watch Video Solution**

**Additional Question Very Short Answer Questions**

**1.** Write the names of the respiratory organs present in human beings





**Watch Video Solution**

**2. Name two animals which carry on anaerobic respiration.**



**Watch Video Solution**

**3. Where are conchae located ?**



**Watch Video Solution**

4. What are choanae?



[Watch Video Solution](#)

5. Name the cavities which are separated by palate.



[View Text Solution](#)

6. Give the name of the partition between thorax and abdomen.



**Watch Video Solution**

7. Where does the exchange of gases occur?



**Watch Video Solution**

8. Glottis is the opening of\_\_\_\_\_



**Watch Video Solution**

9. Write down the term used for respiratory organs of insects



[Watch Video Solution](#)

10. Name the organ which produces sound.



[Watch Video Solution](#)

11. What is the role of oxyhemoglobin after releasing molecular oxygen in the tissues?



[Watch Video Solution](#)

**12.** Give the vital capacity of the lungs of a normal adult person.



[Watch Video Solution](#)

**13.** What are the respiratory organs of fishes.



[View Text Solution](#)

**14.** What is the maximum number of  $O_2$  molecules with one haemoglobin molecule can carry ?



**Watch Video Solution**

**15.** Define total lungs capacity.



**Watch Video Solution**

**16.** How is haemoglobin differently located in humans and earthworms ?



**Watch Video Solution**

**17.** A fluid filled double membranous layer surrounds the lungs. Name it and mention its important function.



**Watch Video Solution**

**18.** Name the primary site of exchange of gases in our body?



**Watch Video Solution**

**19.** A major percentage (97%) of  $O_2$  is transported by RBCs in the blood. How does the remaining percentage (3%) of  $O_2$  transported?



**Watch Video Solution**



## Additional Question Short Answer Questions

1. How does haemoglobin help in the transport of oxygen from lung to tissue?



[Watch Video Solution](#)

2. What is the role of carbonic anhydrase enzyme in the transport of gases during respiration ?



[Watch Video Solution](#)

3. What is fermentation ? Does it occur in our body ?



**Watch Video Solution**

4. Explain the main problem of water breathing

.



**View Text Solution**

5. Respiratory organs of kingcrab are called book-gills .why ?



**View Text Solution**

6. What is the vital capacity of lungs ?



**Watch Video Solution**

7. Name the cartilages that support the larynx.



**Watch Video Solution**

8. What tissues separate the air of the alveoli and blood of pulmonary capillaries?



[Watch Video Solution](#)

9. What is respiratory quotient ? Give RQ for carbohydrates fats and proteins



[Watch Video Solution](#)

**10.** What is meant by Respiration Quotient (RQ) ? When will the value of RQ be 1 and when will it be less than 1 ?



**Watch Video Solution**

**11.** Complete the following sentence:

(i) Nasal chambers are separated from the oral cavity by .....

(ii) air and food passages cross in the ....

(iii) Larynx communicates with the ..... by

glottis

(iv) The ..... checks the entry of food into the respiratory tract.

(v) Lungs lie in the thoracic cavity separated by ..... from the abdominal cavity .

(vi) two layers of peritoneum, called ..... and ..... enclose each lung.

(vii) Left lung has ..... lobes right lung has ..... lobes.

(viii) Wall of alveoli consists of simple ..... squamous epithelium.

(ix) A film of ..... lines the alveoli to keep them open by lowering surface tension

(x) the ..... corpuscles have respiratory pigment named .....

(xi) Air left in the lungs after expiration is called .....

(xii) volume of air normally inspired or expired in one breath is termed .....

(xiii) Prawn respire with ..... and insects with .....

(xiv) Sound is produced by vibrations of ..... located in the .....

(x v) Amount of air inhaled and exhaled with maximum effort is referred to as the ..... of the lungs.



Watch Video Solution

12. fill in the blanks :

(a) ..... ml of oxygen is transported per decilitre of blood.

(b) Total lung capacity is .....

(c ) There are ..... pairs of spiracles in cockroach.

( d ) lungs is enclosed by ..... membrane . Itbgt (e ) ..... bacteria cause pneumonia.



Watch Video Solution



**13.** Match the items in column I with those (one or more ) given in column II .

**Column I**

- (i) Yeast
- (ii) Diaphragm
- (iii) Insects
- (iv) Pons varolii
- (v) Chloride shift

**Column II**

- (a) Inspiration
- (b) Hamburger's phenomenon
- (c) Diffusion of  $\text{Cl}^-$  ions into R.B.Cs
- (d) Fermentation
- (e) Trachea
- (f) Pneumotaxic centre
- (g) Expiration



**Watch Video Solution**

**14.** complete the missing terms.

(a)

Inspiratory

capacity

$$(IC) = \dots\dots\dots + IRV$$

$$(b) \dots\dots\dots = TV + IRV + ERV$$

(c ) Functional residual capacity

$$(FRC) = ERV + \dots\dots\dots$$



Watch Video Solution

**15.** Name the organs of respiration in the following organisms.

(a) Flatworm .....

(b) Birds .....

(c) Frog .....

(d) Cockroach .....



Watch Video Solution

**16.** How does the skin of earthworm help in respiration ?



**Watch Video Solution**

**17.** What is chloride shift ? Write its significance during respiration.



**Watch Video Solution**

**18.** Tabulate differences between aerobic and anaerobic respiration .



**Watch Video Solution**

**19.** give the adaptations for gas exchange.



**Watch Video Solution**

**20.** List the parts of respiratory tract. Describe the nasal chambers.



[Watch Video Solution](#)

21. Explain the terms : tidal volume vital capacity and residual volume in relation to respiration.



[Watch Video Solution](#)

22. Enumerate the functions of respiration.



[Watch Video Solution](#)

**23.** How is the inspired air conditioned in man  
? Or

Discuss the advantage of nose breathing over  
mouth breathing .



**Watch Video Solution**

**24.** give a brief account of morphology of  
human lungs.



**Watch Video Solution**

25. "In mammals the lungs replace the skin very effectively as respiratory organs " Explain giving three reasons.



[Watch Video Solution](#)

26. Give the average values of the following in normal adult humans :

(a) Residual volume (b) Arterial  $P_{O_2}$  (d) Rate of resting respiration (e ) Arterial  $P_{CO_2}$  (f ) Venous  $P_{O_2}$ .



[Watch Video Solution](#)

**27.** Briefly write causes symptoms prevention and cure of any one of the following diseases :

(a) Bronchitis (b) Bronchial asthma (c ) Pnemonia (d ) Emphysema ( e) Occupational lung disorders.



**Watch Video Solution**

**28.** Write an account of artificial respiration.



**Watch Video Solution**



**29.** Write briefly about Bohr effect and Haldane effect and their significance.



**Watch Video Solution**

**30.** Write an account of carbon monoxide poisoning.



**Watch Video Solution**

**31.** Fill in the blanks :

(i) During normal quiet breathing on an average, approximately ..... ml of air is inspired or expired by adult human male in each ..... ml of air enters the lung alveoli for the exchange of gases. The remaining fills the respiratory passage and is termed .....

(iii) the amount of air which one can inhale with maximum effort and also exhale with maximum effort is termed as ..... It is about ..... in normal adult person.

(iv) The air that always remains in the lungs

even after forceful expiration is called ..... It is about .....

(v ) The ratio of the volume of  $CO_2$  produced to the volume of  $O_2$  used in a unit time is called ..... For fats it is .....



[Watch Video Solution](#)

**32.** Fill in the blanks with correct words :

(a) Diaphragm contracts to help in ..... while the contraction of abdominal muscles helps in .....

(b) vital capacity of trained athletes is ..... than that of non-athletes while the vital capacity of non- smokers is ..... than that of smokers.

( c ) Leeches  $P_{O_2}$  is ..... than the venous  $P_{O_2}$  while arterial  $P_{O_2}$  is ..... than the alveolar  $P_{O_2}$

( e ) The volume of air left in the lungs after a maximum expiration is called ..... while the volume of air breathed out during a normal restful respiration is called .....



[Watch Video Solution](#)

**33.** Give two example of each of the following :

(a) Animals having external gills

(b) Anaerobes

(c) Animals having internal gills

( d ) Animals groups showing tracheal  
respiration

(e ) Animals reveling buccopharyngeal  
respiration

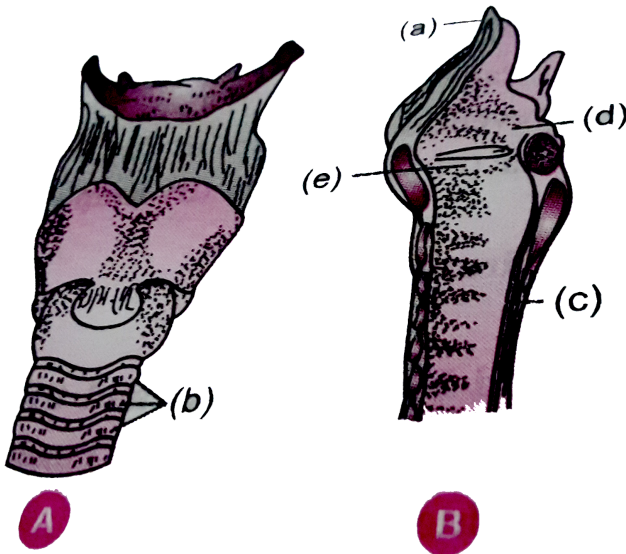


**Watch Video Solution**

34. Study the figure depicting human larynx carefully and answer the following question:

(i) some parts are labelled as a,b,c,d,e . Name them

(ii) Write one major function of each of these.



Watch Video Solution

**35.** Match the items in column A with suitable ones in column B :

**Column A**

- (a) Trachea
- (b) Respiratory centres
- (c) Yeast
- (d) Insects
- (e) Branchial respiration
- (f) Biologically useful energy
- (g) 100 mm. Hg.
- (h) Vocal cords

**Column B**

- (a) Alveolar air
- (b) ATP
- (c) Cartilaginous rings
- (d) Medulla oblongata
- (e) Larynx
- (f) Tracheal respiration
- (g) Ethanol
- (h) Fish



**Watch Video Solution**

**36.** Match the terms in column A with those in column B

**Column A**

- (a) Trachioles
- (b) Carbonic anhydrase
- (c) Lactic acid
- (d) Fermentation
- (e) Gill filaments
- (f) Cutaneous respiration
- (g) Diaphragm

**Column B**

- (i) Yeast
- (ii) Fish
- (iii) Inspiration
- (iv) Vital capacity
- (v) Fast muscle
- (vi) Insect
- (vii) Bicarbonates
- (viii) Earthworm



**Watch Video Solution**

**37.** which of the following statements are correct . ?

(i) Fishes respire with the lungs .

(ii) A water breather expends much more energy in ventilating its respiratory surface than an air-breathing one.



(iii) Lungs become empty after forceful expiration.

(iv) A rise in  $P_{O_2}$  increase the affinity of haemoglobin for oxygen.

(v ) Lactic acid is produced in anaerobic respiration .

(vi) Exchange of gases in the lungs is interrupted during expiration.

(vii) A molecule of haemoglobin can carry 1-4 molecules of oxygen.

(viii) maximum contraction of diaphragm causes maximum expiration.

(ix) Respiratory movements are controlled by

$CO_2$  concentration of arterial . blood.

(x ) Tidal volume is equal ot the vital capacity of the lungs.



[Watch Video Solution](#)

**38.** State whether the following statements are true or false :

(a) Fishes respire with their skin.

(b) Aerobic respiration produces lactic acid at the end.

( c ) Gas exchanges continue uninterrupted in

the lungs after a forceful expiration.

(d ) A person can expal brough about by the relaxation of inspiratory muscles.

(f ) vital capacity represents the maximum capacity to ventilate the lungs.

( g) A rise in  $P_{CO_2}$  increase the oxygen -affinity of haemoglobin.

( h) Forceful expiration results from a forceful contraction of diaphragm.

(i) Oxyhaemoglobin can hold much less carbon dioxide in the form of carbaminohaemoglobin than what deoxyhaemoglobin can.



[Watch Video Solution](#)

**39.** Consider the following four statements (I - iv) and select the correct option stating which ones are true (T) and which ones are false (F).

(i) Formation of oxyhaemoglobin occurs on alveolar surface.

(ii) During gaseous exchange the gases diffuse from high partial pressure to low partial pressure.

(iii) Carbon dioxide cannot be transported with haemoglobin.

(iv) Earthworm respire through parapodia.



Watch Video Solution

40. State the different modes of  $CO_2$  transport in blood.



Watch Video Solution

41. Compared to  $O_2$  diffusion rate of  $CO_2$  through the diffusion membrane per unit difference in partial pressure is much higher. Explain.



[Watch Video Solution](#)

## Additional Question Long Answer Questions

1. Explain the main features of respiration in cockroach.



[Watch Video Solution](#)

2. Define the following terms.

(a) Anaerobic respiration , (b) Breathing , (c )

Vital capacity , (d) Tidal volume , (e )

Respiratory centre.



[Watch Video Solution](#)

**3.** Give an account of the human respiratory tract.



[Watch Video Solution](#)

**4.** Describe the mechanism of pulmonary respiration.



[Watch Video Solution](#)

5. How does the exchange of gases occur in respiration between blood and alveolar air.



[Watch Video Solution](#)

6. Discuss the transport of gases ( $O_2$  and  $CO_2$ ) in the blood.



[Watch Video Solution](#)



7. Describe the human larynx. How is sound produced ?



**Watch Video Solution**

8. How is  $CO_2$  taken up from tissues and transported to lungs ?



**Watch Video Solution**

**9.** How does the exchange of gases occur in respiration between blood and alveolar air.



**Watch Video Solution**

**10.** How is oxygen transported in the blood and released to the tissue ?



**Watch Video Solution**

**11.** Describe how the contraction and relaxation of some skeletal muscles produce respiratory movements.



**Watch Video Solution**

**12.** Write in detail about various respiratory disorders.



**Watch Video Solution**

**13.** Explain the mechanism of breathing with neat labelled sketches.



**Watch Video Solution**

**14.** Explain the role of neural system in regulation of respiration.



**Watch Video Solution**

**Analytical Questions With Answers**

1. What is silicosis ? In which way affects the respiratory system ?



[View Text Solution](#)

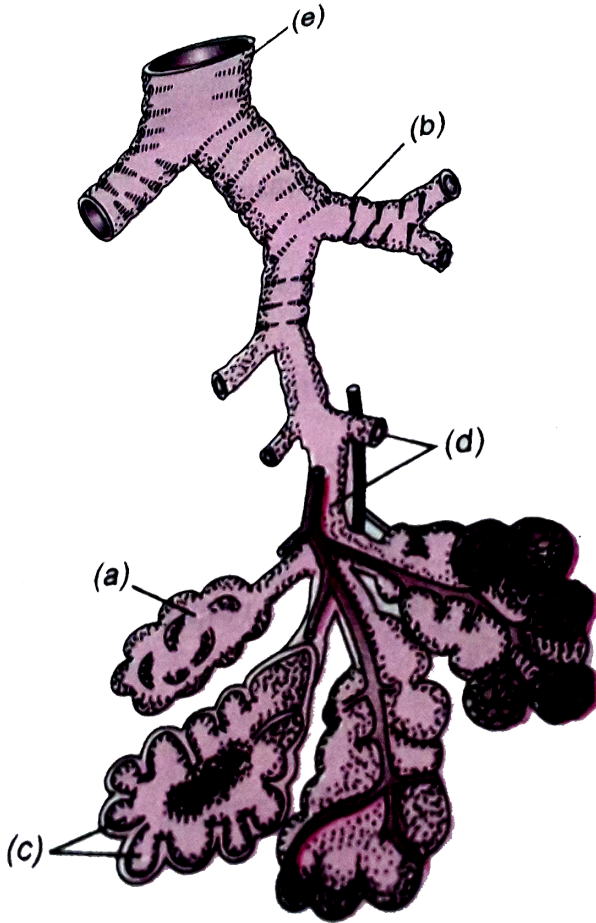
2. (i) Study the given figure of respiratory passage carefully . Parts are labelled as a,b,c,d and e. Label these parts .

(ii) How many secondary bronchi are there in right and left human lung ?

(iii) What is the approximate length width of human trachea (wind pipe) ?

(iv) What is the role of epiglottis?

(v) In which body cavity the lungs are located ?



**Watch Video Solution**

**3.** How does the lung-fish protopterus breathe during hibernation in mud ?



**Watch Video Solution**

**4.** How do the epiglottis and uvula differ in their role ?



**Watch Video Solution**

5. How do the words oxygenation and oxidation differ ?



**Watch Video Solution**

6. what is the role of carbonic anhydrase in humans ? Where is it operative ?



**Watch Video Solution**



7. Cigarette smoking causes emphysema. Give reason.



[Watch Video Solution](#)

8. Why is nasal breathing advantageous over mouth breathing ? Explain .



[View Text Solution](#)

9. What is dead space air ?



[Watch Video Solution](#)

**10.** How does faetal haemoglobin ensure survival of foetus inside the mother's body ?



[View Text Solution](#)

**11. (a)** What are the end products in anaerobic respiration ? How much energy is released in it ? Is it considered wasteful process ?

(b) Does anaerobic respiration occur in aerobes ? Give example .



[View Text Solution](#)

**12.** Given below are respiratory structures and list of some animals . Match them appropriately.

Respiratory structures. Book gills pharyngeal wall lungs gills , book lungs , body surface , skin.

Animals . Pigeon , scorpion , planaria ,  
earthworm spiders , king crab, prawn , labeo ,



**Watch Video Solution**

**13. (a)** What is 'Adam 's apple' ? Is it more prominent in male or female ?

(b) What is the role of epiglottis ?



**Watch Video Solution**

**14.** (a) In normal breathing which of the following is an active process.

Inspiration or expiration ? Also tell why ?

(b) In normal human how many times normal breathing occurs at rest per minute ?



**Watch Video Solution**

**15.** (i) What meant by respiratory quotient (RQ)

?

(ii) what is the value of RQ for glucose fats and proteins ?



[Watch Video Solution](#)

**16.** How are marine mammals able to make long underwater dives ? Explain.



[Watch Video Solution](#)

**17.** How would you differentiate between artificial hypoxia and anaemic hypoxia ?



[Watch Video Solution](#)

**18.** A person has stopped breathing due to smoke inhalation. What should be immediately done and how ?



[Watch Video Solution](#)

[Practice Questions Multiple Choice Questions](#)

1. When  $CO_2$  concentration in blood increases breathing becomes

A. slow and deep

B. faster and deep

C. shallower and slow

D. there is no effect on breathing

**Answer: B**



**Watch Video Solution**



2. Blood analysis of a patient reveals an unusually high quantity of carboxyhemoglobin content. Which of the following conclusion is the most likely to be correct? The patient has been inhaling polluted air containing unusually high content of

- A. Carbon dioxide
- B. Carbon monoxide
- C. Carbon disulphide
- D. Chloroform

**Answer: B**



**Watch Video Solution**

### **3. Severe acute respiratory syndrome**

A. Is caused by a variant of pneumococcus

pneumoniae

B. Is caused by a variant of the common

cold virus (corona virus )

C. Is an acute form of asthma

D. Affects non-vegetarians much faster than the vegetarians

**Answer: B**



**View Text Solution**

4. After taking a long deep breath we do not respire for some seconds due to

A. more  $CO_2$  in blood

B. more  $O_2$  in blood

C. less  $CO_2$  in blood

D. less  $O_2$  in blood

**Answer: C**



**Watch Video Solution**

5. How much per cent of air is expired ?

A. 0.07

B. 0.32

C. 0.25

D. 0.2

**Answer: B**



**Watch Video Solution**

**6.** Maximum amount of oxygen is exchanged from the blood in the

A. capillaries surrounding tissue cells

B. arteries of the body

C. left auricle of the heart

D. capillaries surrounding the alveoli

**Answer: A**



**View Text Solution**

7. The majority of carbon dioxide produced by our body cells is transported to the lungs -

A. attached to haemoglobin

B. dissolved in the blood

C. as bicarbonates

D. as carbonates

**Answer: C**



**Watch Video Solution**

**8.** The process after glycolysis in anaerobic respiration is known as

A. fermentation

B. respiration

C. Krebs's cycle

D. decomposition

**Answer: A**



**View Text Solution**

9. Identify the correct statement with reference to transport of respiratory gases by blood.

A. Haemoglobin is necessary for transport of carbon dioxide and carbonic



anhydrase for transport of oxygen .

B. Haemoglobin is necessary for transport of oxygen and carbonic anhydrase for transport of carbon dioxide

C. Only oxygen is transported blood.

D. Only carbon dioxide is transported by blood.

**Answer: B**



**Watch Video Solution**

10. Residual volume is

- A. lesser than tidal volume
- B. greater than inspiratory volume
- C. greater than vital capacity
- D. greater than tidal volume

**Answer: D**



**Watch Video Solution**

11. Mosquito receives air through

A. flagellum

B. cilia

C. pedicel

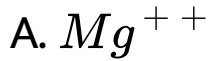
D. none of these

**Answer: D**



**Watch Video Solution**

12. In Hamburger's phenomenon which ion is transported ?



**Answer: C**



**Watch Video Solution**

**13.** The air which is breath in and out quietly is called

A. vital air

B. residual air

C. tidal air

D. total lung capacity

**Answer: C**



**Watch Video Solution**

14. What is vital capacity of our lungs

A. inspiratory reserve volume + expiratory  
reserve volume

B. total lung capacity - residual volume

C. inspiratory reserve volume + tidal  
volume

D. total lung capacity - expiratory reserve  
volume

**Answer: B**

---



Watch Video Solution

15. the haemoglobin of a human foetus

- A. has only 2 protein subunits instead of 4
- B. has a higher affinity for oxygen than that of a adult
- C. has a lower affinity for oxygen than that of a adult
- D. its affinity for oxygen is the same as that of a adult

**Answer: B**



**Watch Video Solution**

**16.** Oxygen carrying capacity of human blood is reduced due to the pollution of

A.  $CO_2$

B.  $CO$

C.  $SO_2$

D.  $O_3$



**Answer: B**



**Watch Video Solution**

**17.** Read the following statements and select the correct one

A. the  $H^+$  released from carbonic acid combines with Hb to form haemoglobin acid

B. oxyhaemoglobin of erythrocytes is alkaline

C. more than 70% of  $CO_2$  is transferred from tissues to lungs in the form of carbamino compounds

D. in a healthy person the Hb content is more than 25 gms per 100 ml

**Answer: A**



**Watch Video Solution**

**18.** the amount of volume of air that can be inspired / expired normally is called

A. tidal volume

B. vital capacity

C. residual volume

D. normal volume

**Answer: A**



**Watch Video Solution**

19. Book lungs are respiratory organs of

A. mollusca

B. mammals

C. arachnida

D. earthworm

**Answer: C**



**Watch Video Solution**

20. Respiration in insects is called direct because

A. the tissues exchange  $O_2/CO_2$  directly

with the air in the tubes

B. the tissues exchange  $O_2/CO_2$  directly

with coelomic fluid

C. The tissues exchange  $O_2/CO_2$  directly

with air outside through body surface

D. Tracheal tubes exchange  $O_2/CO_2$

directly with the haemocoel which then exchange with tissues.

**Answer: D**



**Watch Video Solution**

**21.** Regarding the functions of our respiratory system, mark the wrong entry

A. Humidifies the air

B. Warms up the air

C. Diffusion of gases

D. Cleans up the air

**Answer: D**



**Watch Video Solution**

**22.** A person suffers punctures in his chest cavity in an accident, without any damage to the lungs its effect could be

- A. Reduced breathing rate
- B. Rapid increase in breathing rate
- C. No change in respiration
- D. Cessation of breathing

**Answer: D**



**Watch Video Solution**

**23.** It is known that exposure to carbon monoxide is harmful to animals because



A. It reduces  $CO_2$  transport

B. it reduces  $O_2$  transport

C. In increases  $CO_2$  transport

D. It destroys haemoglobin

**Answer: D**



**Watch Video Solution**

**24.** Mark the true statement among the following with reference to normal breathing.

A. Inspiration is a passive process where as expiration is active

B. Inspiration is a active process where as expiration is passive

C. Inspiration and expiration are active processes

D. Inspiration and expiration are passive processes

**Answer: B**



**Watch Video Solution**

25. A person breathes in some volume of air by forced inspiration after having a forced expiration. This quantity of air taken in is

- A. Total lung capacity
- B. Tidal volume
- C. Vital capacity
- D. Inspiratory capacity

**Answer: A**



**Watch Video Solution**

26. Mark the incorrect statement in context to

$O_2$  binding to Hb

A. Higher  $pH$

B. Lower temperature

C. Lower  $pCO_2$

D. Higher  $PO_2$

**Answer: D**



**Watch Video Solution**

**27.** Mark the incorrect statement in context to  $O_2$  normal breathing in humans

A. External and internal intercostal muscles

B. Diaphragm and abdominal muscles

C. Diaphragm and external intercostal muscles

D. Diaphragm and internal intercostal muscles

**Answer: C**



**Watch Video Solution**

**28.** Incidence of Emphysems - a respiratory disorder is high in cigarette smokers. In such cases

A. the bronchioles are found damaged

B. The avleolar walls are found damaged

C. The plasma membrane is found  
damaged

D. the respiratory muscles are found damaged

**Answer: B**



**Watch Video Solution**

**29.** Respiratory process is regulated by certain specialized centres in the brain. One of the following listed centres can reduce the inspiratory duration upon stimulation

A. Medullary inspiratory centre

B. Pneumotaxic centre

C. Apneustic centre

D. Chemosensitive centre

**Answer: B**



**Watch Video Solution**

30.  $CO_2$  dissociated from carbamino haemoglobin when



A.  $pCO_2$  is high and  $pO_2$  is low

B.  $pO_2$  is high and  $pCO_2$  is low

C.  $pCO_2$  and  $pO_2$  are equal

D. None of the above

**Answer: B**



**Watch Video Solution**

**31.** In breathing movements, air volume can be estimated by

A. Stethoscope

B. Hygrometer

C. Sphygmomanometer

D. Spirometer

**Answer: D**



**Watch Video Solution**

**32.** From the following relationship between respiration volumes and capacities, mark the correct option.

(i) Inspiratory Capacity (IC) = Tidal Volume +  
Residual Volume

(ii) Vital Capacity (VC) = Tidal Volume (TV) +  
Inspiratory Reserve Volume (IRV) + Expiratory  
Reserve Volume (ERV)

(iii) Residual Volume (RV) = Vital Capacity (VC) -  
Inspiratory Reserve Volume (IRV)

(iv) Tidal Volume (TV) = Inspiratory Capacity  
(IC) - Inspiratory Reserve Volume (IRV)

A. (i) Incorrect , (ii) Incorrect , (iii) Incorrect

(iv) Correct

B. (i) Incorrect (ii) Correct (iii) Incorrect (iv)

Correct

C. (i) correct , (ii) Correct, (iii) Incorrect , (iv)

Correct

D. (i) Correct , (ii) Incorrect , (iii) correct (iv)

Incorrect

**Answer: B**



**Watch Video Solution**

33. The oxygen - haemoglobin dissociation curve will show a right shift in case of

A. High  $pCO_2$

B. High  $pO_2$

C. Low  $pCO_2$

D. Less  $H^+$  concentration

**Answer: B**



**Watch Video Solution**

**34.** Match the following and mark the correct options

Animal	Respiratory organ
Earthworm	(i). Moist cuticle
Aquatic Arthropods	(ii). Gills
Fishes	(iii). Lungs
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

**Answer: B**





Watch Video Solution

35. During lactic acid fermentation,.....

A.  $O_2$  is used  $CO_2$  is not liberated

B.  $O_2$  is not used  $CO_2$  is liberated

C.  $O_2$  is used  $CO_2$  is liberated

D. Neuther  $O_2$  is used nor  $CO_2$  is liberated

**Answer: D**



Watch Video Solution

**36.** According to Boyle's law, the product of pressure and volume is a constant. Hence,

A. if volume of lungs is increased the pressure decreases disproportionately

B. if volume of lungs is increased the pressure remains the same

C. if volume of lungs is increased the pressure decreases proportionately



D. if volume of lungs is increased the pressure also increases proportionately

**Answer: C**



**Watch Video Solution**

**37.** Volume of air inspired or expired with each normal breath is known as

A. tidal volume

B. inspiratory reserve volume

C. expiratory reserve volume

D. residual volume

**Answer: A**



**Watch Video Solution**

**38.** The urge to inhale in humans results from

A. rising  $P_{CO_2}$

B. rising  $P_{O_2}$

C. falling  $P_{CO_2}$

D. falling  $P_{O_2}$

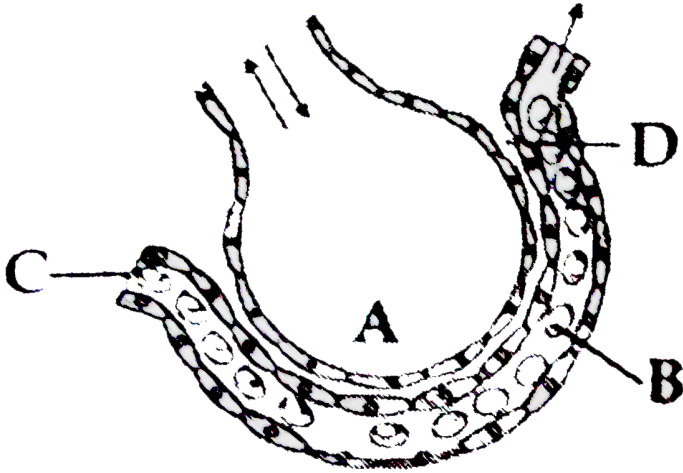
**Answer: A**



**Watch Video Solution**

**39.** The figure given below shows a small part of human lung where exchange of gases takes place. In which one of the option given below, the one part A, B, C or D is correctly identified

along with its functions



A. C : arterial capillary - passes oxygen to  
tissues

B. A: alveolar cavity - main site of exchange  
of respiratory gases

C. D : capillary wall - exchange of

$O_2$  and  $CO_2$  takes place here

D. B : red blood cells - transport of  $CO_2$

mainly

**Answer: B**



**Watch Video Solution**

**40.** A large proportion of oxygen is left unused the human blood even after its uptake by the body tissue. This  $O_2$

A. acts as a reserve during muscular exercise

B. raise the  $pCO_2$  of blood to 75 mm of Hg

C. is enough to keep oxyhaemoglobin saturation at 96%

D. helps in releasing more  $O_2$  to the epithelial tissues

**Answer: A**



**Watch Video Solution**

**41.** Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of

A. epiglottis

B. diaphragm

C. neck

D. tongue

**Answer: A**



Watch Video Solution

42. Which one of the following is a possibility for most of us in regards to breathing, by making a conscious effort

A. one can breathing out air totally without oxygen

B. one can breathe out air through Eustachian tube by closing both nose and mouth



- C. one can consciously breathe in and breathe out by moving the diaphragm alone. Without moving the ribs at all
- D. the lungs can be made fully empty by forcefully breathing out all air from them

**Answer: B**



**Watch Video Solution**

43. Bulk of carbon dioxide ( $CO_2$ ) released from body tissues into the blood is present as

A. bicarbonate in blood plasma and RBGs

B. 70% carbamino-haemoglobin and 30%  
as bicarbonate

C. free  $CO_2$  in blood plasma

D. carbamino -haemoglobin in RBCs

**Answer: A**



**Watch Video Solution**

44. When fats are respiratory substrate the value of R.Q would be

- A. approx . 0.7
- B. approx . 1.0
- C. more than 1.0
- D. none of these

**Answer: A**



**Watch Video Solution**

45. Glycolysis term has originated from Greek words

- A. glycos and lysis
- B. glycys and lysis
- C. glyco and lysis
- D. glucose and lysis

**Answer: B**



**Watch Video Solution**

**46.** Which one of the following is the correct statement for respiration in humans ?

A. cigarette smoking may lead to inflammation of bronchi

B. Neural signals from pneumotaxic centre in pons region of brain can increase the duration of inspiration

C. workers in grinding and stone-breaking industries may suffer from lung fibrosis

D. About 90% of carbon dioxide ( $CO_2$ ) is carried by haemoglobin as carbamino haemoglobin

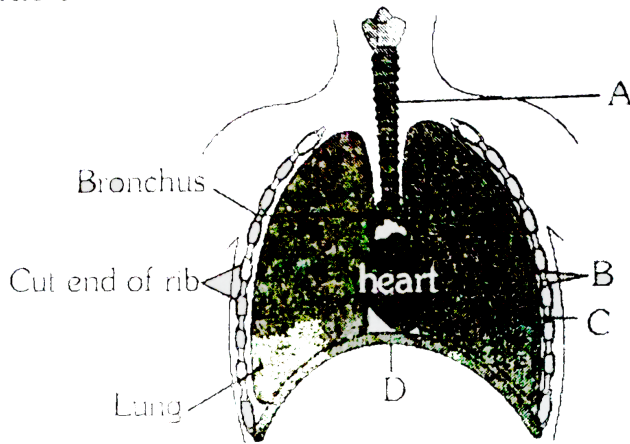
**Answer: C**



**Watch Video Solution**

**47.** the figure shows a diagrammatic view of human respiratory system with labels A, B , C and D . Select the option which given correct identification and main function and / or

# characteristic



A. B - Pleural membrane - Surround ribs on both sides to provide cushion against rubbing

B. C- Alveoli -Thin walled vascular bag like structures for exchange of gases.

C. D- Lower end of lungs -Diaphragm pulls it down during inspiration .

D. A -Trachea -Long tube supported by complete cartilaginous rings for conducting inspired air.

**Answer: B**



**Watch Video Solution**



**48.** Approximately seventy percent of carbon dioxide absorbed by the blood will be transported to the lungs

A. as bicarbonate ions

B. in the form of dissolved gas molecules

C. as carbamino - haemoglobin

D.

**Answer: A**



**Watch Video Solution**

**49.** Aerobic respiration produces more usable chemical energy than fermentation, because fermentation involves

- A. formation of lactic acid
- B. complete oxidation of food
- C. partial oxidation of food
- D. evolution of  $CO_2$  and alcohol

**Answer: C**



**Watch Video Solution**

50. Forced deep breathing for a few minutes by a person sitting at rest may be followed by a temporary cessation of breathing. This is due to

A. too much  $CO_2$  in the blood

B. too much  $O_2$  in the blood

C. very little  $CO_2$  in the blood

D. both high  $O_2$  and very little  $O_2$  in the  
blood

**Answer: D**



**Watch Video Solution**

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

A. Asthma

B. pleurisy

C. Emphysema

D. Pneumonia

**Answer: C**



**Watch Video Solution**

**52.** Name the chronic respiratory disorder caused mainly by cigarette smoking

A. Asthma

B. Respiratory acidosis

C. Respiratory alkalosis

D. Emphysema

**Answer: D**



**Watch Video Solution**

**53.** Reduction in pH of blood will

A. reduce the blood supply to the brain

B. decrease the affinity of hemoglobin with  
oxygen

C. release bicarbonate ions by the liver

D. reduce the rate of heart beat

**Answer: B**



**Watch Video Solution**

**54.** Asthma may be attributed to

A. allergic reaction of the mast cells in the

lungs

B. inflammation of the trachea

C. accumulation of fluid in the lungs

D. bacterial infection of the lungs

**Answer: A**



**Watch Video Solution**

**55.** The partial pressure of oxygen in the alveoli of the lungs is

A. equal to that in the blood

B. more than that in the blood

C. less than that in the blood



D. less than that of carbon dioxide

**Answer: B**



**Watch Video Solution**

**56.** Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because

A. there is a negative pressure in the lungs

- B. there is a negative intrapleural pressure  
pulling at the lung walls
- C. there is a positive intrapleural pressure
- D. pressure in the lungs is higher than the  
atmospheric pressure

**Answer: B**



**Watch Video Solution**

57. Lungs are made up of air-filled sacs the alveoli. They do not collapse even after forceful expiration, because of

A. inspiration reserve volume

B. tidal volume

C. expiratory reserve volume

D. residual volume

**Answer: D**



**Watch Video Solution**

58. Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively

A. Inflammation of bronchioles , Decreased respiratory surface

B. Increased number of bronchioles , Increased respiratory surface

C. Increased respiratory surface , Inflammation of bronchioles

D. Decreased respiratory surface ,

Inflammation of bronchioles

**Answer: A**



**Watch Video Solution**

**59.** match the given in column I with those in column II and select the correct option given

below .

below.

Column I		Column II	
A. Tidal volume		(i) 2500 – 3000 mL	
B. Inspiratory reserve volume		(ii) 1100 – 1200 mL	
C. Expiratory reserve volume		(iii) 500 – 550 mL	
D. Residual volume		(iv) 1000 – 1100 mL	

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



[Watch Video Solution](#)

60. Which of the following is an occupational respiratory disorder ?

A. Anthrax

B. Silicosis

C. Botulism

D. Emphysema

**Answer: B**



**Watch Video Solution**

**Practice Questions Assertion Reason Type  
Questions**

1. Assertion . All terrestrial vertebrates are air - breathers.

Reason . They have developed lungs for air breathing an adaptation for land life.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.



**Answer: A**



**Watch Video Solution**

2. Assertion . Aerobic respiration is bioenergetically more efficient than anaerobic respiration.

Reason. Aerobic respiration takes place in mitochondria whereas anaerobic respiration occurs in the cytoplasm.

- A. If both A and R are true and R is the correct explanation of A.
- B. If both A and R are true but R is not the correct explanation of A
- C. if A is true but R is false.
- D. If both A and R are false.

**Answer: B**



**Watch Video Solution**

3. Statement 1 : Rate of breathing is regulated is regulated by respiratory centres present in the medulla oblongata.

Statement 2 , Changes in the  $CO_2$  level of the arterial blood control the rate of breathing.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.

**Answer: B**



**Watch Video Solution**

4. Statement 1 : About 70 % of  $CO_2$  that enters *RBCs* changes into  $HCO_3^-$  for transport in plasma to the lungs where it reconverts into  $CO_2$  for elimination.

Statement 2 : About 40 % of  $CO_2$  that enters

*RBCs* changes into carbaminohaemoglobin which releases  $O_2$  in the lungs.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.

**Answer: C**



**Watch Video Solution**

5. Assertion.  $CO_2$  is carried in the plasma mainly as  $HCO_3^-$  ions

Reason. Zinc -containing enzyme carbonic anhydrase of RBCs catalyses the formations fo  $HCO_3^-$  ions that enter plasma.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.

**Answer: A**



**Watch Video Solution**

**6. Assertion.** Human lungs have enormous surface area for exchange of gases.

**Reason.** In humans glottis is guarded by epiglottis.

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.

**Answer: B**



**Watch Video Solution**



7. Assertion. Earthworms come out of their burrows on rainy days .

Reason . Rain water fills their burrows depriving them of  $O_2$

A. If both A and R are true and R is the correct explanation of A.

B. If both A and R are true but R is not the correct explanation of A

C. if A is true but R is false.

D. If both A and R are false.

**Answer: A**



**Watch Video Solution**

**8. Assertion.** Respiration is most efficient in the insects.

**Reason .** In the insects air is carried directly to the cells by tracheoles



**Watch Video Solution**

**9. Assertion :** In mammals, complex respiratory system has developed.

**Reason :** Mammalian skin is impermeable to gases.



**Watch Video Solution**

**10. Assertion.** Tidal volume is the volume of air inspired or expired with the normal breath .

**Reason** Adult person contains 500 ml expired

or inspired volumes of air with each normal breath.



[Watch Video Solution](#)

## Curiosity Questions

1. Why should we breathe all the time ?



[Watch Video Solution](#)

2. Why do large animals cannot carry on respiration without circulatory system



[Watch Video Solution](#)

3. What is the significance of respiratory pigment in the blood of many animals ?



[Watch Video Solution](#)

4. Why is lungs / air breathing advantageous?



[Watch Video Solution](#)

5. How is nasal breathing superior to oral breathing ?



[Watch Video Solution](#)

6. Does the colour of the blood change on gaining and losing oxygen ?



[Watch Video Solution](#)

7. How are marine mammals able to make long underwater dives ? Explain.



[Watch Video Solution](#)

## Notable Questions

1. What enables the diving mammals (seals , whales ) to stay under water for a long time ?



[Watch Video Solution](#)