BIOLOGY

BOOKS - MAXIMUM PUBLICATION

BREATHING AND EXCHANGE OF GASES

Exercise

1. Respiration in insects is called direct because

A. The tissues exchange $\frac{O_2}{C}O_2$ directly with the air in the tubes

B. The tissues exchange $\frac{O_2}{C}O_2$ directly with coelomic fluid

C. The tissues exchange $\frac{O_2}{C}O_2$ directly with the air outside through body surface

D. Tracheal tubes exchange $\frac{O_2}{C}O_2$ directly with the haemocoel which then exchange with tissues

Answer: A::B::C::D

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2. 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: A::C

3. Inspiration and expiration are passive processes 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::C

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4. Incidence of Emphysema - a respiratory disorder is high in cigarette smokers. In such cases

A. The alveolar walls are found damaged

B. The plasma membrane is found damaged

C. The bronchioles are found damaged

D. The respiratory muscles are found damaged

Answer: A::B::D

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5. 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: A::C

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6. $CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow HCO_3^- + H +$

These all the reactions that takes place in accordance with respiration. Br Where these reactions takes place?

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7. $CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow HCO_3^- + H +$

These all the reactions that takes place in accordance with respiration. Br Which is the enzyme present here?

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8. Fill in the table with appropriate heading values.

Respiratory gas	Atmospheric air	Alveoli	a	b	Tissues
O_2	159	104	40	95	40
CO_2	0.3	40	45	c	d

A. Blood (Deoxygenated)

B. Blood (oxygenated)

C. 40

D. 45

Answer: A::B::D

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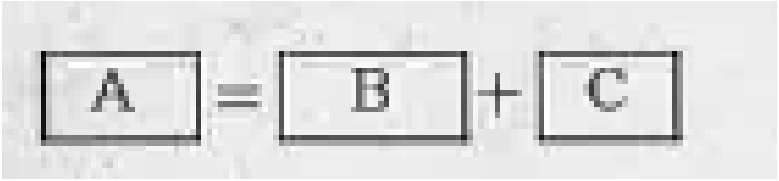
9. In the following diagram A represent Total lung capacity and B represent Vital capacity

and then C represent what?



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10. Name the biological principle involved in the exchange of gas between lungs and blood.

A. Transmittance

B. Osmosis

C. Diffusion

D. Incorporation

Answer: D

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11. What is the percentage of oxygen transported by Haemoglobin in the form of Oxyhaemoglobin?

A. 0.67

B. 0.97

C. 0.32

D. 0.5

Answer:

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12. Oxyhaemoglobin $\rightarrow$ Oxygen + Hb. Where does this process takes place ?

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13. Oxyhaemoglobin $\rightarrow$ Oxygen + Hb. What are the factors that influence 02 dissociation curve ?

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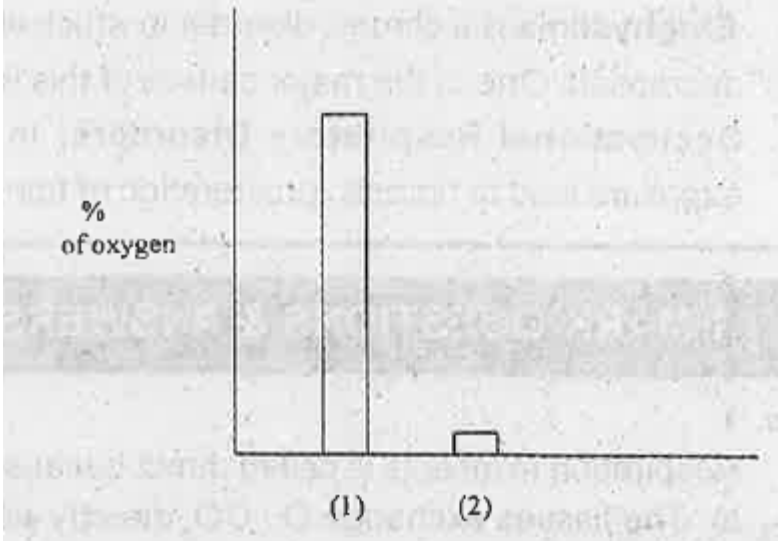
14. Bar diagram showing oxygen transport is shown below.



Name the two methods of oxygen transport.

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15. Match the following.

A. Prawn- Skin

B. Cockroach- Lungs

C. Viper -Gills

D. Earthworm- Trachea

Answer:

$(\#\#EXP_VAD_ZOO_XI_C06_E02_{009}\_A01\#\#)$

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16. Emphysema' is a term linked with 'Respiratory system'. What is emphysema?

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17. Draw a flow chart showing the air passage in the human respiratory system. Br (Trachea, nasal cavity, nasopharynx, bronchi, nos-trils, alveoli, bronchioles, larynx)

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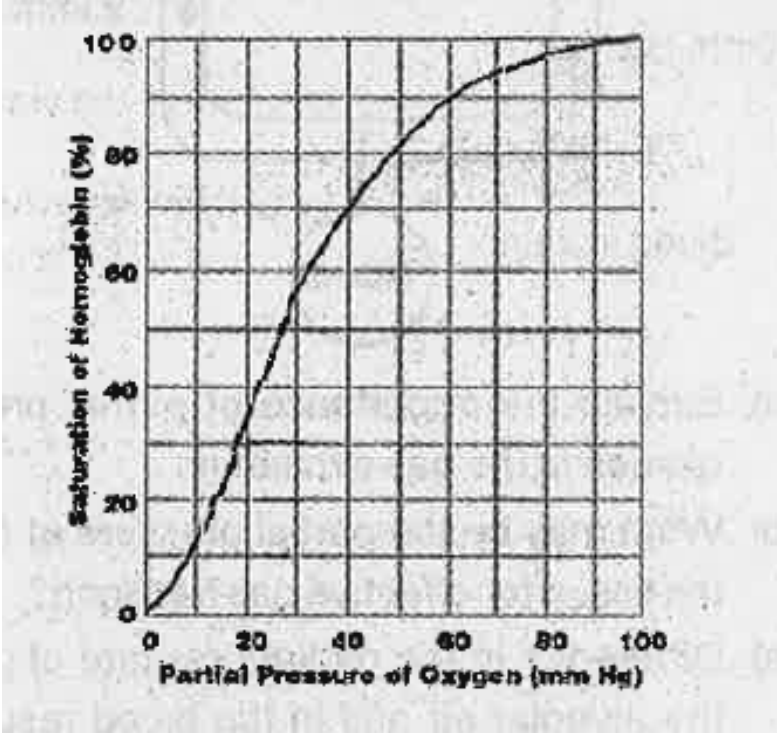
18. Study the graph and answer the following questions.



What is represented by the graph ?

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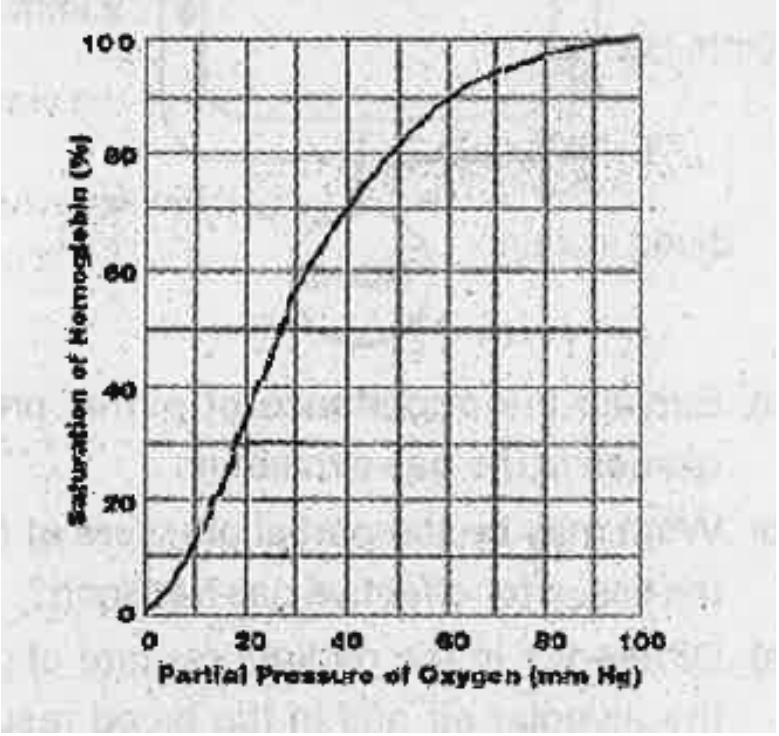
19. Study the graph and answer the following questions.



Find out the pressure at which Haemoglobin is 50% saturated with O_2?

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20. Name the structural and functional unit of lungs.

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21. Why the lungs replaces the skin in Mammals as respiratory organ.

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22. The pO_2 in cell cytoplasm is always lower than the capillary blood while pCO_2 is greater. How do you account for this?

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23. A dog expires CO_2, How can you correlate the relationship between the dog and grazing cattle in terms of CO_2.

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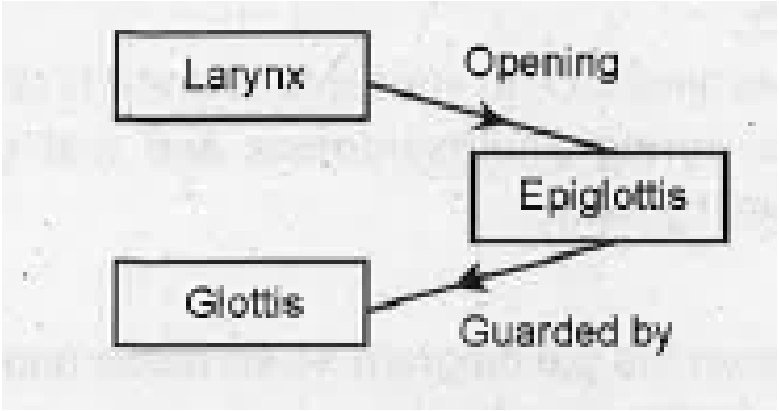
24. Analyse the concept map given below and if have mistakes reconstruct it.



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25. A person exhaled nearly more than 3000 ml of air during a breathing exercise. How do you justify that act?

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26. In order to give the awareness about healthy practices to reduce respiratory disorders, prepare a pamphlet.

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27. The venous blood in the lungs has a pCO_2 of 46mm Hg. Should the alveolar pCO_2 exceeds or be less than 46mmHg to result in

diffusion of CO_2 from the blood into alveolus?

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28. Human respiration is controlled by intercostal muscles in the ribs and diaphragm. Justify this statement.

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29. While analysing the blood of normal healthy person, it has been found that the amount of HCO_3 ions in his venous blood is much higher than his arterial blood. How do you account for this increase of HCO_3 ions.

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30. Place the following in the correct order. Lungs expand, rib rise, air enters lungs,

external intercostal muscle contract, thorax expands.

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31. Pneumatoxic centre has an important role in E regulating rate of respiration. Prepare a flow chart representing the regulation of respiration by pneumatoxic centre during strenuous exercise.

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32. Transport of CO2, as Bicarbonates.  Copy the diagram and fill the gaps.

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33. Transport of CO_2, as Bicarbonates. 

Name the other ways of CO_2 transport.

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34. Transport of CO_2, as Bicarbonates. If blood chlorine level decrease, does it affect gas transport? Justify.

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35. Analyse the flow chart.  Distinguish the function of external and internal intercostal muscles.

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36. Analyse the flow chart.  Distinguish the function of external and internal intercostal muscles.

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37. Pharynx is a common passage for air and food. Name the part for the passage of food.

Watch Video Solution

38. Pharynx is a common passage for air and food. Name the part for the passage of air.

Watch Video Solution

39. Pharynx is a common passage for air and food. How do these passage work without any problems?

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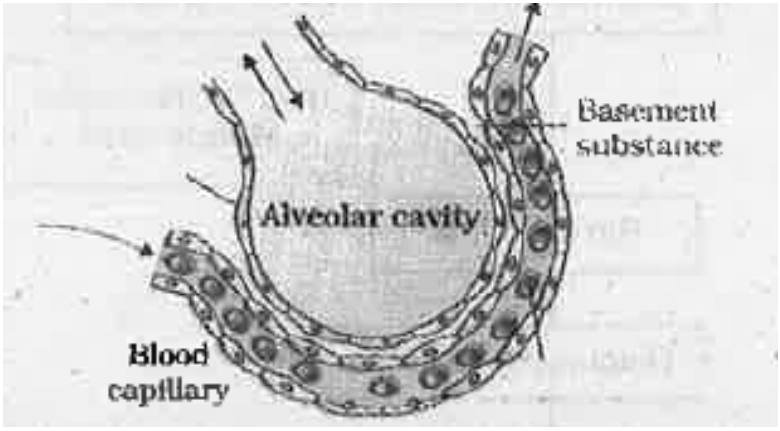
40. Following figure shows a microscopic section through the alveoli in the lungs of man.



Give the features visible in the diagram that help to increase the rate of diffusion across the wall of the alveoli into the blood.

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41. A person inhales to his maximum capacity and then he exhales also to his maximum. a) What term would you use for the volume of air thus breathed out.

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42. A person inhales to his maximum capacity and then he exhales also to his maximum. What is the volume of air thus breathed out?

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43. A person inhales to his maximum capacity and then he exhales also to his maximum. Suppose he hold his breath after that maximum expiration for 5 seconds would there be any exchange of respiratory gases occuring in lungs during that period. How?

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44. Human beings have a significant ability to maintain and moderate the respiratory

rhythm to suit the de mand of body tissues-substantiate.

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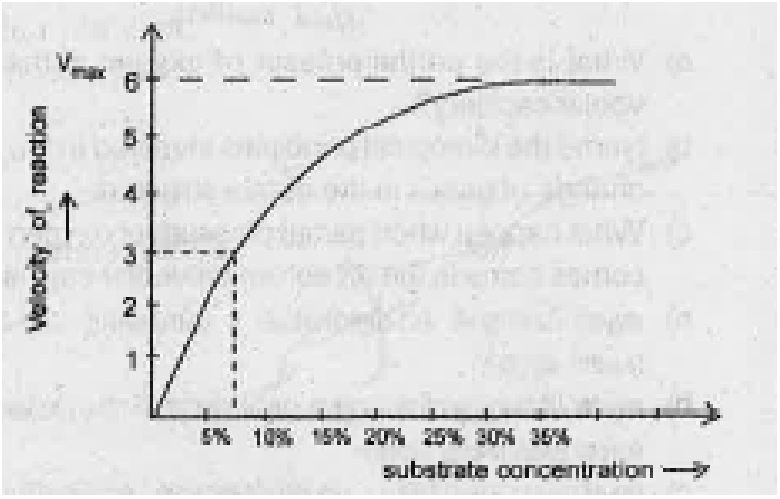
45. Observe the graph



What is meant by $'V_{\max}$ value?

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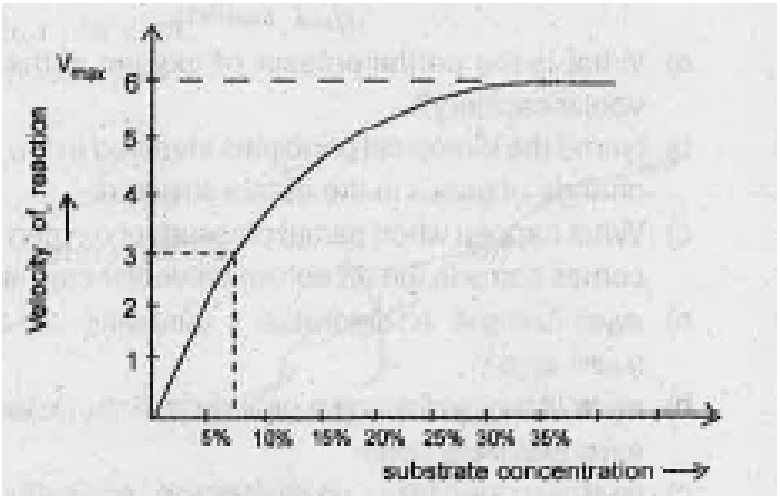
46. Observe the graph



Why is '$V_{\max}$ not exceeded by any further rise in the substrate concentration?

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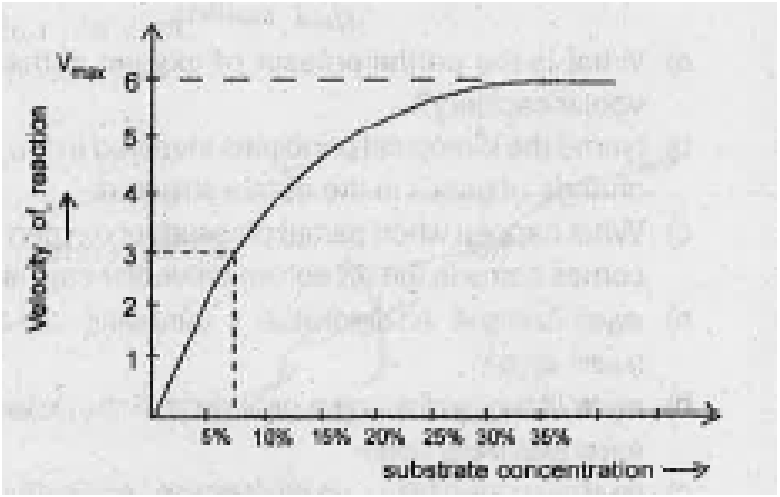
47. Observe the graph



If a chemical substance closely resembling to that of a substrate is introduced into the reaction system, what will be the consequences ? Substantiate.

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48. In a 400 metre race competition, Athira won the first place. Her friends commented that it is due to her high vital capacity. a) What do you understand by the tem vital capacity?

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49. In a 400 metre race competition, Athira won the first place. Her friends commented that it is due to her high vital capacity. Suggest the ways to improve the vital capacity.

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50. In a normal person expiratory reserve volume and residual volume were found to be 1000 ml and 1100 ml respectively. Find out his functional residual capacity?

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51. In a normal person expiratory reserve volume and residual volume were found to be 1000 ml and 1100 ml respectively. How the

functional residual capacity differ from the vital capacity?

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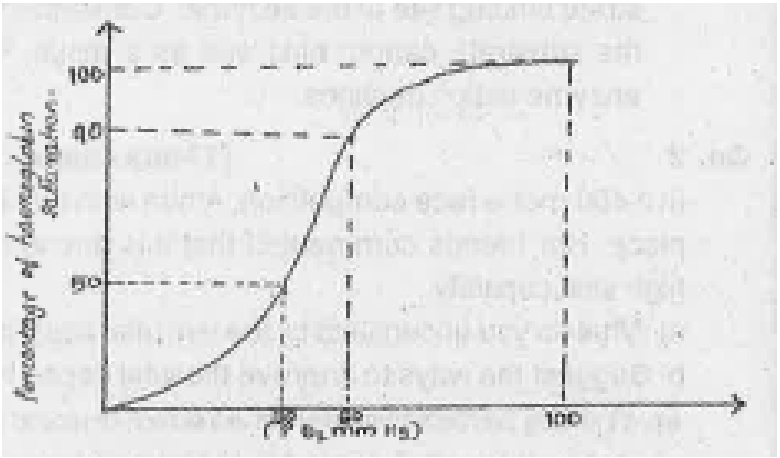
52. The graph given below is oxygen-haemoglobin dis sociation curve. Observe the graph and answer the following questions.



Identify

the PO, where 90% haemoglobin satura tion occurs.

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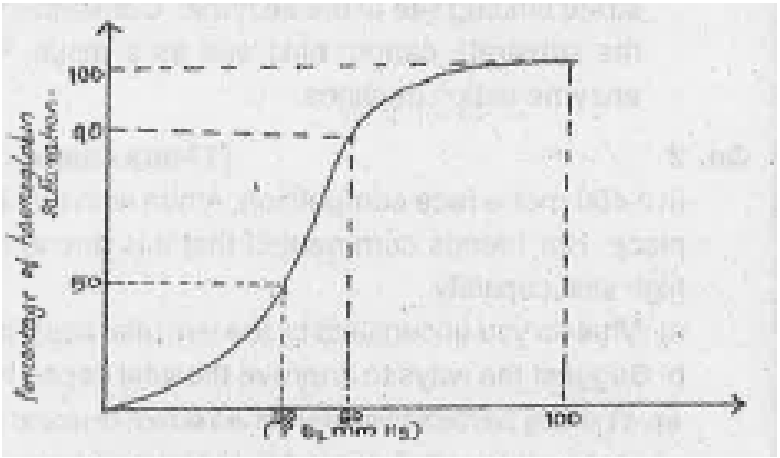
53. The graph given below is oxygen-haemoglobin dis sociation curve. Observe the graph and answer the following questions.



Write

any three factors favorable for the formation of oxyhaemoglobin in alveoli.

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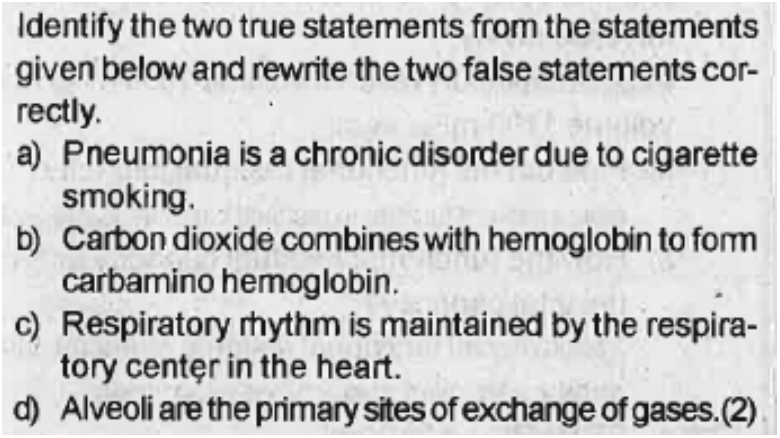
54. Identify the two true statements from the statements given below and rewrite the two false statements correctly.


Identify the two true statements from the statements given below and rewrite the two false statements correctly.

a) Pneumonia is a chronic disorder due to cigarette smoking.

b) Carbon dioxide combines with hemoglobin to form carbamino hemoglobin.

c) Respiratory rhythm is maintained by the respiratory center in the heart.

d) Alveoli are the primary sites of exchange of gases. (2)

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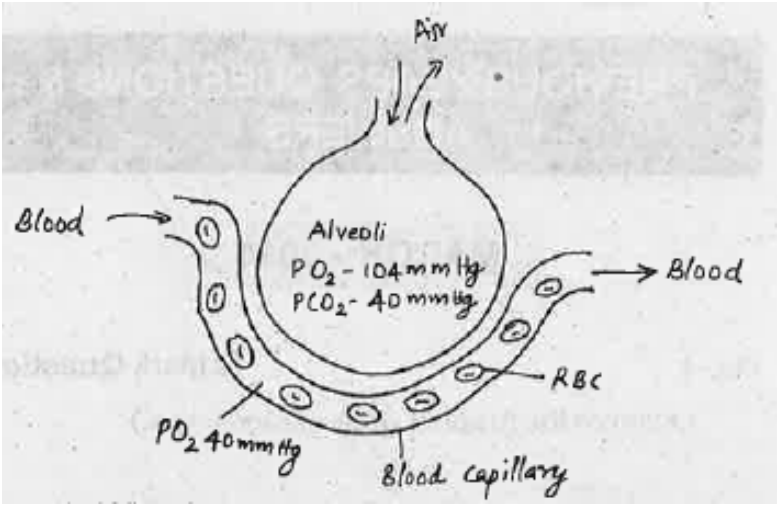
55. Observe the figure and answer the questions.



What is the partial pressur of oxygen in the alveolar capillary?

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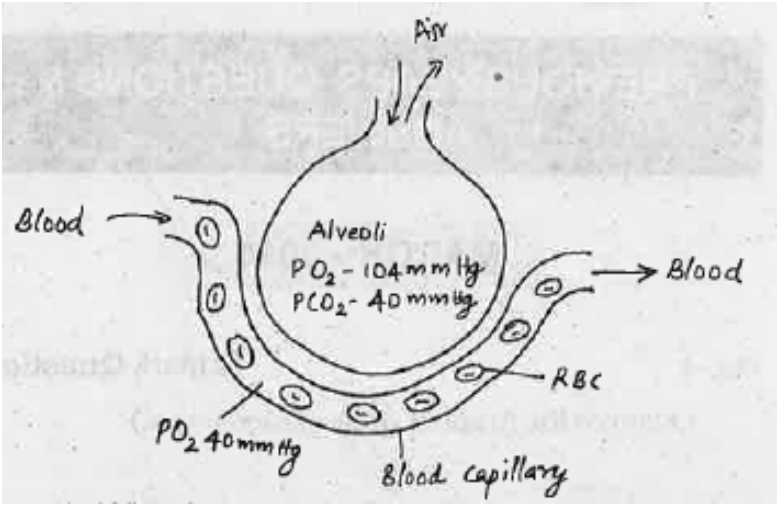
56. Observe the figure and answer the questions.



Name the biological principles involved in the exchange of gases in the above structure.

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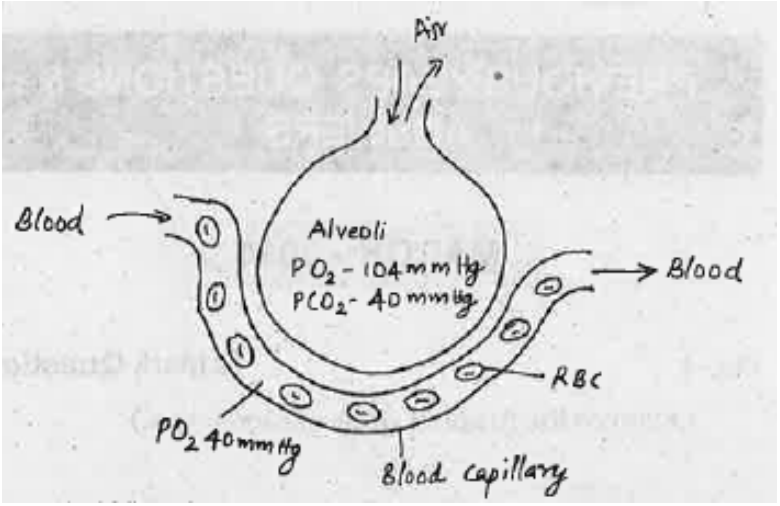
57. Observe the figure and answer the questions.



b) What happen when partial pressure of oxygen be comes same in the alveoli and alveolar capillary?

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58. Pick out the wrong one and justify your selection.

a) VC = ERV + IRV + TV
b) TLC = VC + RV
c) TV = 500 ml
d) ERV = 3000 ml

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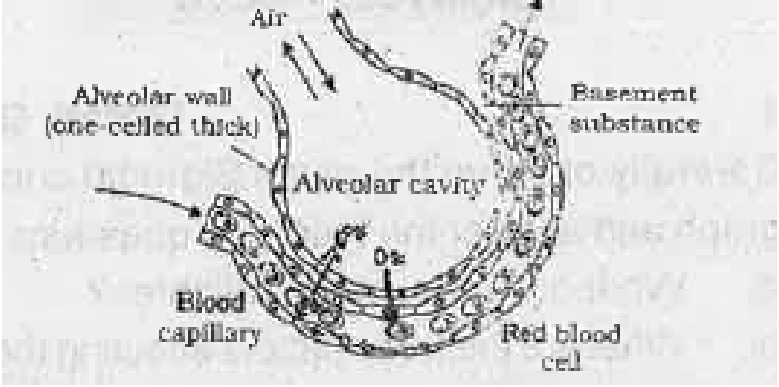
59. Observe the diagram and answer the following question.



Name the biological process involved in the gas exchange shown in the figure.

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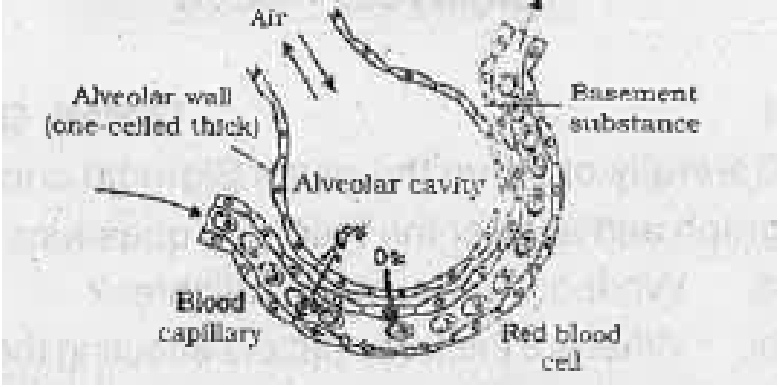
60. Observe the diagram and answer the following question.



How the oxygen is transported to cells from the alveoli?

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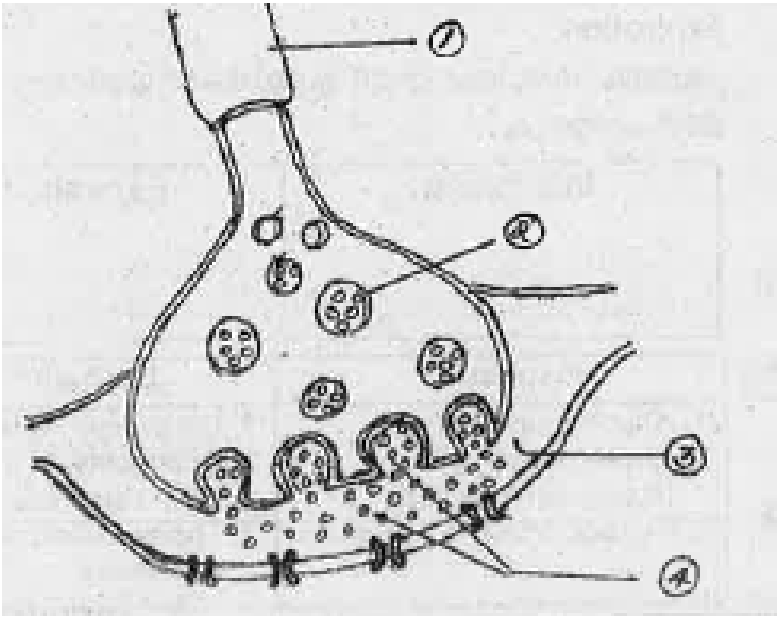
61. Write the functions of parts 1 and 4. Label the parts 2 and 3 in the following figure

showing a synapse.



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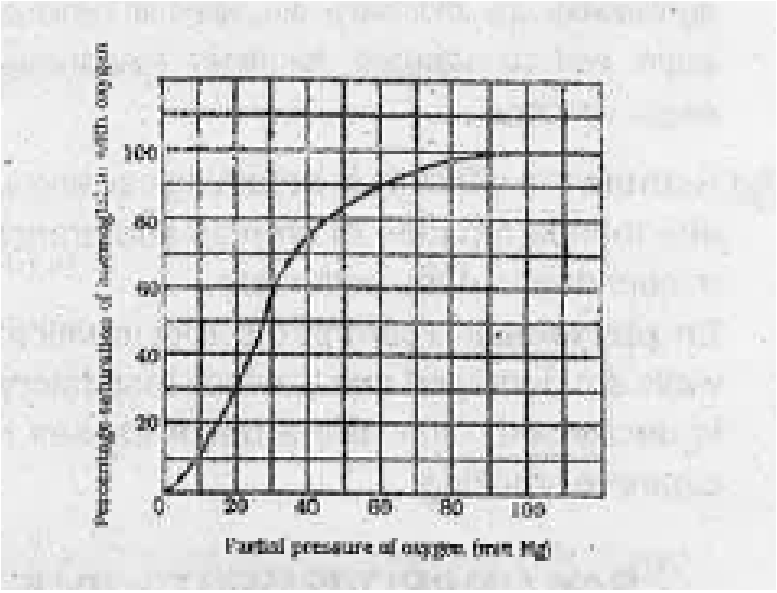
62. 

What is represented by the above graph?

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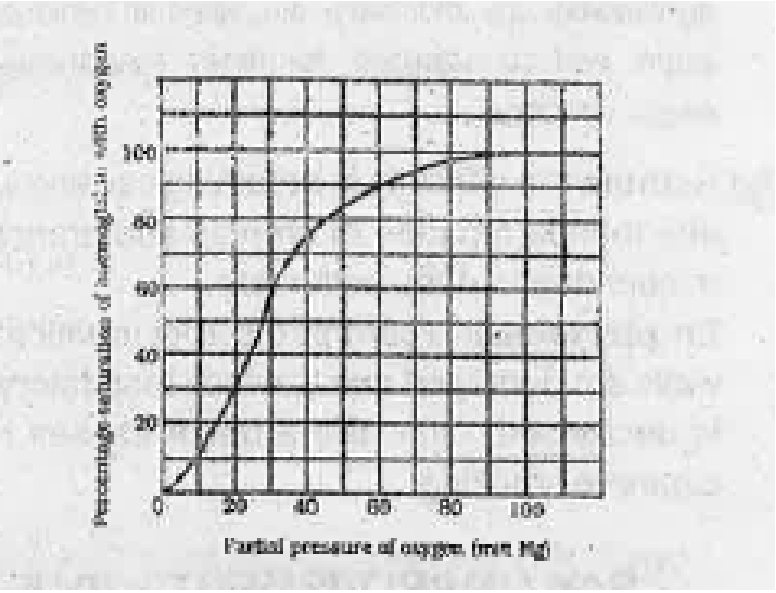
63. 

rite any three factors which can influence the sigmoid curve of this graph

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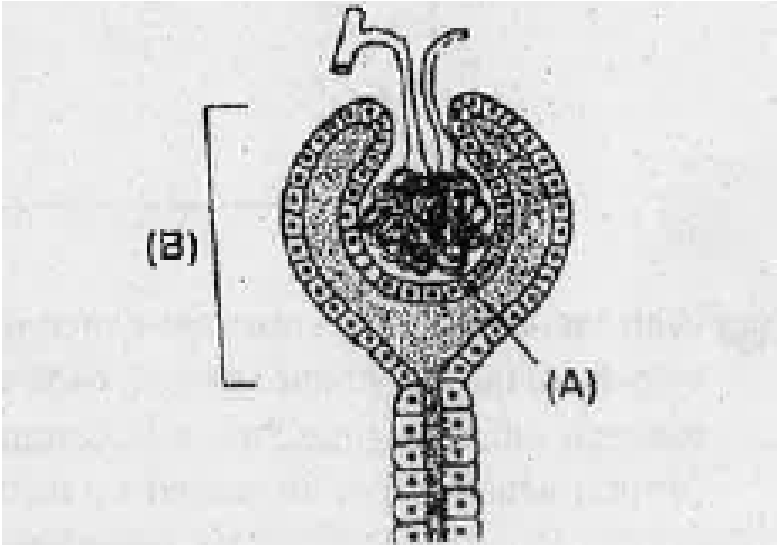
64. Observe the figure given below and answer the questions. Write the name of the figure.



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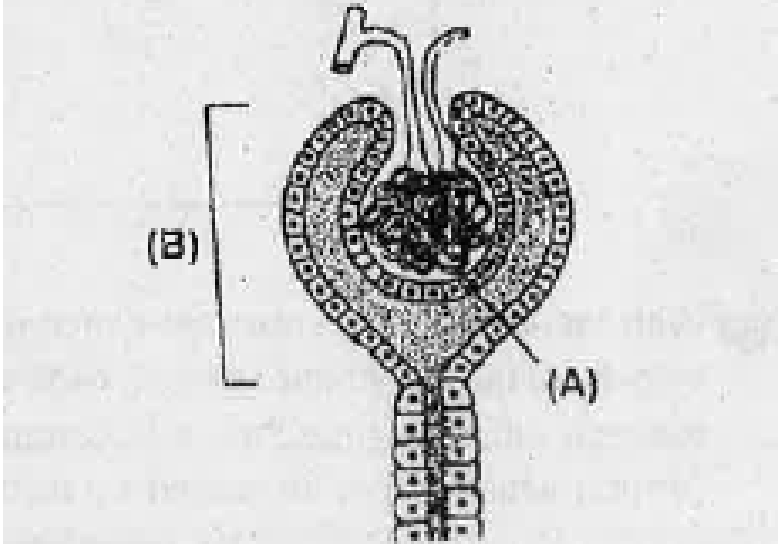
65. Observe the figure given below and answer the questions. Name the labelled part (A) and

(B)



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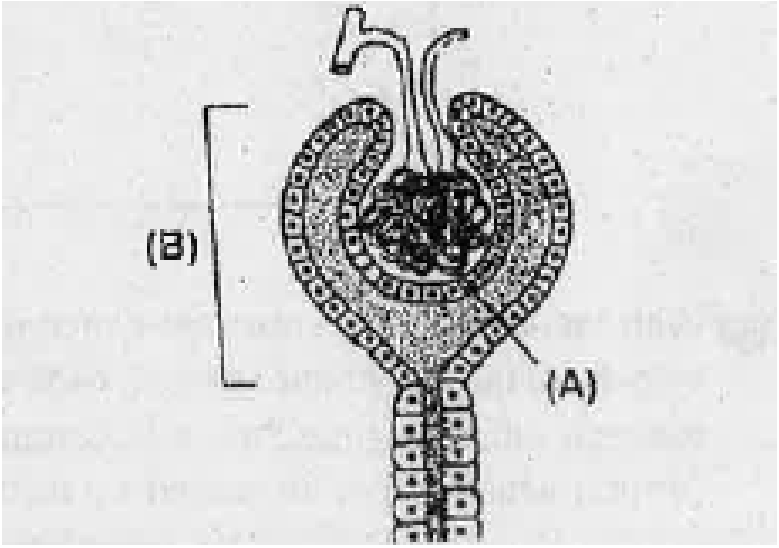
66. Observe the figure given below and answer the questions. Which is the site of formation

of ultrafiltrate?



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67. Asthma and emphysema are two disorders of the human respiratory system. Mention their causes and symptoms.

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68. Correct the following misconceptions of a student regarding human respiration.

a) Vital capacity includes tidal volume, residual volume and dead air.
b) Respiration is controlled by nerve centres located in hypothalamus and cerebrum.

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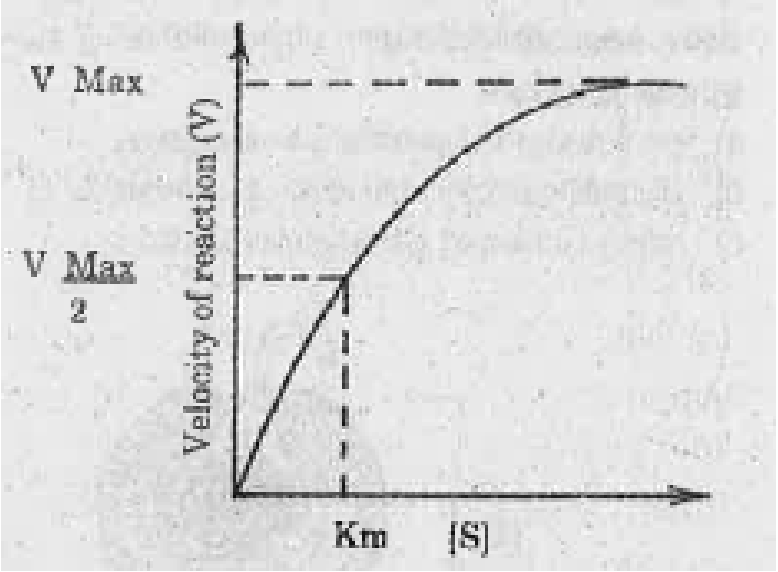
69. Based on the graph given below, explain the effect of concentration of substrate on

enzyme activity.



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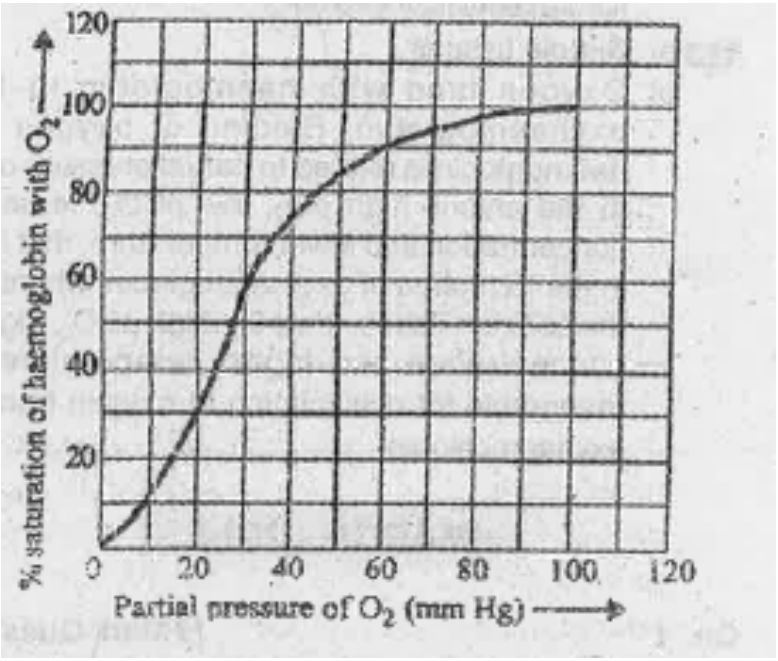
70. Carefully observe the given Sigmoid curve on the graph and answer the following

questions. What does the graph indicates?



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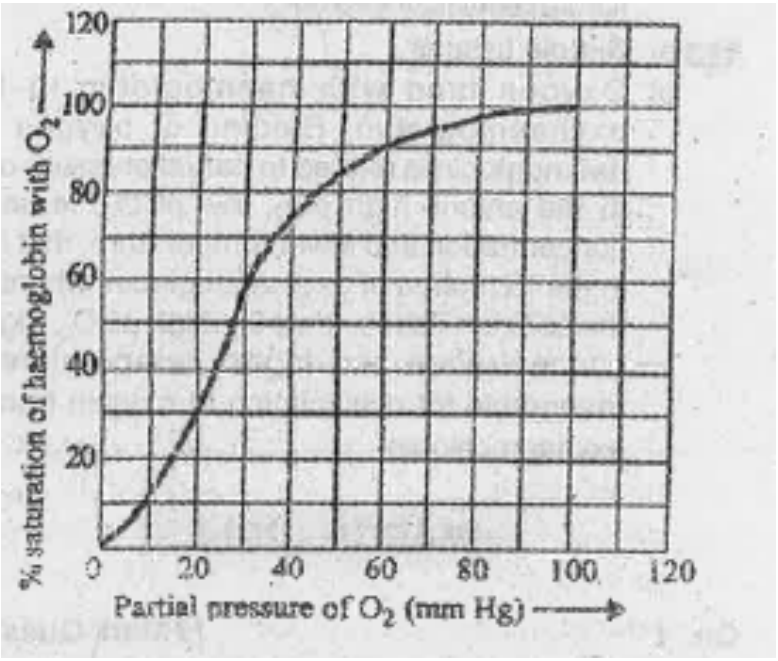
71. Carefully observe the given Sigmoid curve on the graph and answer the following

questions. What are the three factors affecting the Sigmoid pattern of the graph



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72. Differentiate the process of inspiration and expiration.

Inspiration	Expiration
.....	.....
.....	.....

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73. Define vital capacity. What is its significance?

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

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75. What are the major transport mechanisms for CO_2 ? Explain

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76. What will be the pO_2 and pCO_2, in the atmospheric air compared to those in the

alveolar air?

A. pO_2, lesser, pCO_2, higher

B. pO_2 higher, pCO_2 lesser

C. pO_2 higher, pCO_2` higher

D. $pO_2 \leq sser$, pCO_2 lesser

Answer:

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77. What is the effect of pCO_2, on oxygen transport?

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

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79. Which one is the cofactor of carbonic anhydrase?

A. Iron

B. Zinc

C. Copper

D. Magnesium

Answer:

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80. Skin is an accessory organ or respiration in

A. human

B. frog

C. rabbit

D. lizard

Answer:

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81. Which of the following respiratory organs are present in spiders and scorpions?

A. gill slit

B. Gills

C. Gill books

D. Book lungs

Answer:

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82. When the body is rapidly oxidising fats, excess ketone bodies accumulate resulting in

A. pyruvic acid

B. lactic acid

C. ketoacidosis

D. ATP

Answer:

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83. Oxygen dissociation curve is

A. sigmoid

B. parabolic

C. hyperbolic

D. straight line

Answer:

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84. Which one of the following statements is incorrect?

A. The residual air in lungs slightly decreases the efficiency of resplration In mammals

B. The presence of non-resplratory air sacs, increases the efficiency of respiration in birds

C. In insects, circulating body fluids serve to distribute oxygen to tissues

D. The principle of countercurrent flow facilitates efficient respiration in gills of fishes

Answer:

85. Haemoglobin is having maximum affinity with

A. carbon dioxide

B. carbon monoxide

C. oxygen

D. ammonia

Answer:

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86. Which is called Hamburger shift?

A. Hydrogen shift

B. Bicarbonate shift

C. Chloride shift

D. Sodium shift

Answer:

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87. Left shift of oxyhaemoglobin curve is noticed under

A. normal temperature and pH

B. low temperature and high pH

C. low pH and high temperature

D. low pH and low temperature

Answer:

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88. Read the following statements and select the correct one.

A. The H released from carbonic acid combines with haemoglobin to form haemoglobinic acid

B. Oxyhaemoglobin of erythrocytes is alkaline

C. More than 70% of carbon dioxide is transferred from tissues to the lungs in the form of carbamino compounds

D. In a healthy person, the haemoglobin content is more than 25 gm per 100 mL

Answer:

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89. In blood, carbon dioxide is transported majorly as

A. sodium carbonate

B. carboxyhaemoglobin

C. bicarbonate

D. carbon dioxide as such

Answer:

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90. Most of the carbon dioxide is transported in blood as a gas

A. gas

B. carbaminohaemoglobin

C. serum carbaminoproteins

D. HCO_3

Answer:

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91. How many molecules of oxygen can bind to a molecule of haemoglobin?

A. One

B. Two

C. Three

D. Four

Answer:

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92. When carbon dioxide concentration in blood increases, breathing becomes

A. shallower and slow

B. there is no effect on breathing

C. slow and deep

D. faster and deeper

Answer:

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93. The total number of lobes and alveoli present in both the lungs of man are

A. 17 and 30 million, respectively

B. 5 and 300 million, respectively

C. 19 and 300 million, respectively

D. 18 and 300 lakh, respectively

Answer:

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94. What is vital capacity of our lungs?

A. Inspiratory reserve volume plus tidal volume

B. Total lung capacity minus expiratory reserve volume

C. Inspiratory reserve volume plus expiratory reserve volume

D. Total lung capacity minus residual volume

Answer:

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95. When the oxygen supply to the tissues is inadequate, the condition is

A. hypoxia

B. asphyxia

C. pleuracy

D. anoxia

Answer:

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96. Severe Acute Respiratory Syndrome (SARS)

A. is caused by a variant of Pneumococcuspneumoniae

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 vegetarians

Answer:

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97. During inspiration, the diaphragm

A. expands

B. shows no change

C. contracts and flattens

D. relaxes to become dome-shaped

Answer:

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98. The oxygen toxicity is related with

A. blood poisoning

B. collapsing of alveolar walls

C. failure of ventilation of lungs

D.

Answer:

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