BIOLOGY

BOOKS - MTG BIOLOGY (ENGLISH)

BREATHING AND EXCHANGE OF GASES

Corner

1. Statement 1 : Respiration is most efficient in the insects, among the invertebrates.

Statement 2 : In the insects, air is carried directly to the cells by tracheoles.

A. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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2. Read the given statements characterizing certain types of animals. Select the option which correctly exemplifies each of these types.

(i) Animal having external gills

(ii) Animal having internal gills

(iii) Animal showing tracheal respiration

(iv) Animal revealing buccopharyngeal respiration

A.

(i)	(ii)	(iii)	(iv)
Prawn	Arenicola	Unio	*Fish*

B.

(i)	(ii)	(iii)	(iv)
Necturus	Unio	Prawn	*Frog*

C.

(i)	(ii)	(iii)	(iv)
Pila	Arenicola	Unio	Toad

D.

(i)	(ii)	(iii)	(iv)
Necturus	Pila	Milipede	Toad

Answer: D

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3. Match column I with column II and select the correct option from the given codes.

Column I (Animals)	Column II (Respirartory structures)
A. Pigeon	(i) Book gills
B. Scorpion	(ii) Pharyngeal wall
C. Planaria	(iii) Lungs
D. Earthworm	(iv) Gilles
E. Spiders	(v) Book lungs
F. King crab	(vi) Body surface
G. Prawn	(vii) Skin
H. Labeo	

A. (a)

$A-(iii), B-(v), C-(vi), D-(vii), E-(v), F-(i), G-(iv),$

B. (b)

$A-(v), B-(ii), C-(vi), D-(vii), E-(vi), F-(iv), G-(i),$

C. (c)

$A-(vi), B-(iv), C-(vi), D-(v), E-(i), F-(ii), G-(iii),$

D. (d)

$$A-(i), B-(vi), C-(vii), D-(iii), E-(vii), F-(ii), G-(iv$$

Answer: A

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4. Which structure of man is similar to spiracle of cockroach?

A. Nostril

B. Bronchiole

C. Lung

D. Alveolus

Answer: A

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5. Which of the following option is incorrect about the larynx (sound box) ?

A. (a) It is a bony box

B. (b) Glottis is the opening into the larynx.

C. (c) During swallowing of food glottis is covered by epiglottis to prevent food entry into the larynx.

D. (d) All of these

Answer: A

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6. Which of the following structures close the glottis during swallowing to prevent the entry of food wind pipe

A. Tongue

B. Epiglottis

C. Diaphragm

D. Larynx

Answer: B

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7. In man and mammals, air passes from outside into the lungs through

A. a) nasal cavity, larynx, pharynx, trachea, bronchi, alveoli

B. b) nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli

C. c) nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli

D. d) nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli

Answer: D

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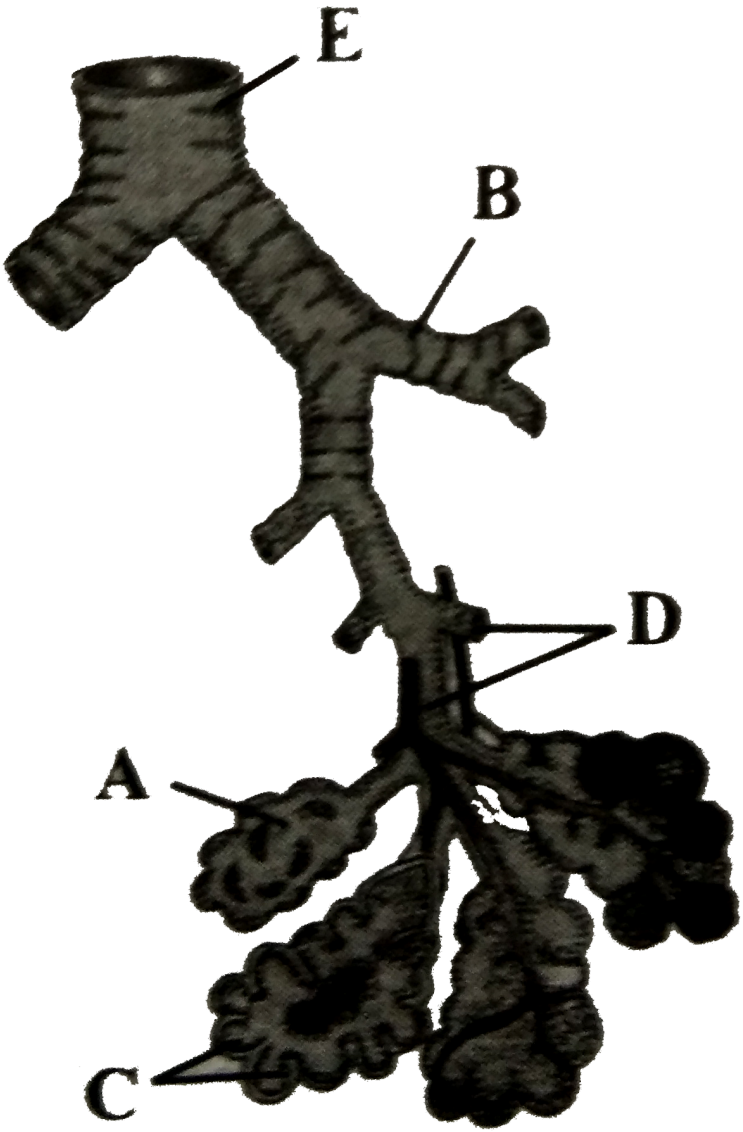
8. Study the given figure of respiratory passage carefully and identify the parts labelled as A, B, C, D and E.



A. a)

A	B	C	D	E
Alveolar sac	secondary brounchus	Alveoli	Bronchioles	Trachea

B. b)

A	B	C	D	E
Alveoli	secondary brounchus	Alveolar sac	Trachea	Bronchioles

C. c)

A	B	C	D	E
Alveolar sac	Tertiary brounchus	Alveoli	Trachea	Bronchioles

D. d)

A	B	C	D	E
Alveoli	Tertiary brounchus	Alveolar sac	Bronchioles	Trachea

Answer: A

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9. Mammalian lungs have an enormous number of minute alveoli (air sacs). This is to allow

A. more surface area for difusion of gases

B. more space for increasing the volume of inspired air

C. more nerve supply to keep the lungs working

D. more spongy texture for keeping lung in proper shape.

Answer: A

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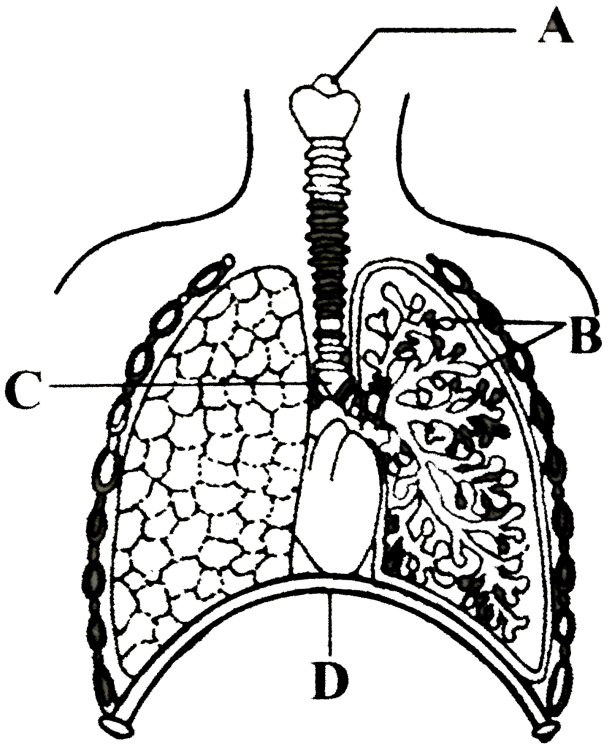
10. The given figure shows the diagrammatic view of human respiratory system. Identify A, B, C and D.



A. A-Epiglottis, B-Alveoli, C-Bronchus, D-Diaphragm

B. A-Epiglottis, B-Alveoli, C-Bronchioles, D-Diaphragm

C. A-Soundbox, B-Alveoli, C-Brounchus, D-Diaphragm

D. A-Larynx, B-Alveoli, C-Brounchioles, D-Diaphragm

Answer: A

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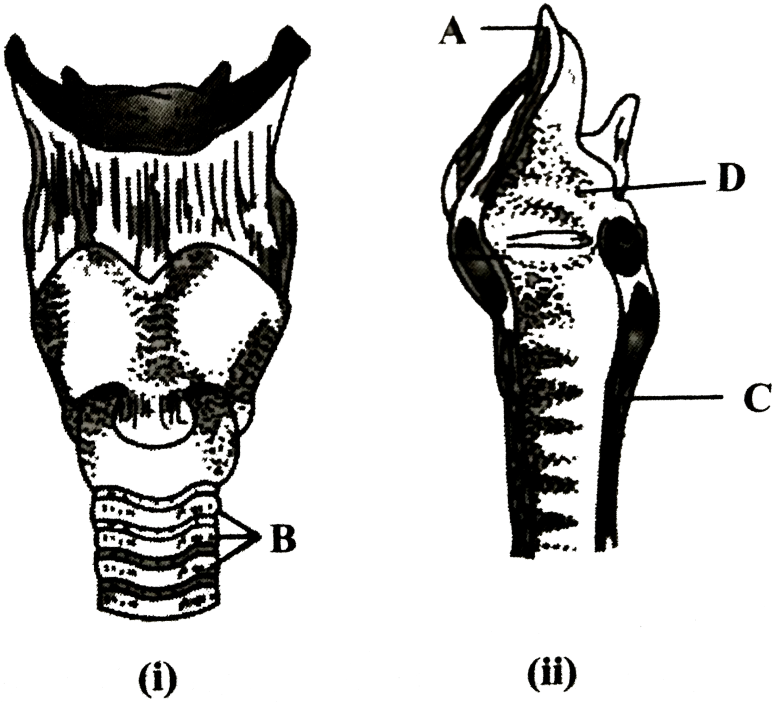
11. The given figures are of human larynx, front view (i) and vertical section (ii).



Identify the labelled parts A to D.

A. (A) Glottis (B) Larynx (C) Vocal cord (D) Cartilaginous rings of trachea

B. (A) Epiglottis (B) Cartilaginous rings of trachea (C) Trachea (D) Larynx

C. (A) Glottis (B) Cartilaginous rings of trachea (C) Larynx (D) Trachea

D. (A) Epiglottis (B) Bony rings of trachea (C) Larynx (D) Trachea

Answer: B

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12. Lungs are enclosed in

A. perichondrium

B. pericardium

C. pleural membrane

D. peritoneum.

Answer: C

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13. Thoracic chamber is formed dorsally by the $\underline{(i)}$, vertrally by the $\underline{(ii)}$, laterally by the $\underline{(iii)}$ and on lower side by the dome shaped $\underline{(iv)}$.

Select the correct option to complete the above paragraph.

A. (i) vertebral column (ii) sternum (iii) ribs (iv) diaphragm

B. (i) sternum (ii) vertebral column (iii) diaphragm (iv) ribs

C. (i) diaphragm (ii) ribs (iii) vertebral column (iv) sternum

D. (i) ribs (ii) diaphragm (iii) vertebral column (iv) sternum

Answer: A

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14. Given below is a list of different steps (i-vi) involved in respiration.

(i) Utilisation of O_2 by the cells for catabolic reactions.

(ii) Transport of gases by the blood.

(iii) Pulmonary ventilation by which atmospheric air is drawn in and CO_2 is released out.

(iv) Release of resultant CO_2.

(v) Diffusion of O_2 and CO_2 between blood and tissues.

(vi) Diffusion of gases (O_2 and CO_2) across alveolar tissues.

Select an option which has correct sequence of all the steps.

A. $(iii), (vi), (ii), (v), (i), (iv)$

B. $(iii), (vi), (i), (v), (ii), (iv)$

C. $(iv), (ii), (v), (iii), (i), (vi)$

D. $(iv), (vi), (ii), (v), (i), (iii)$

Answer: A

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15. Inspiration occurs when there is a negative pressure in the lungs with respect to atmospheric pressure. This negative pressure is achieved when

A. intrapulmonary pressure is less than the atmospheric pressure

B. Intrapulmonary pressure is greater than the atmospheric pressure

C. intrapulmonary pressure is equal to the atmospheric pressure

D. intrapleural pressure becomes more than the intra-alveolar pressure.

Answer: A

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16. Statement 1 : Mammals can eat while breathing.

Statement 2 : Mammals have negative-pressure breath-ing.

A. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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17. The ventilation movements of the lungs in mammals are governed by

A. muscular walls of lung

B. diaphram

C. costal muscles

D. both (b) and (c)

Answer: D

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18. Fill up the blanks in the following paragraph by selecting the correct option.

The movement of air into and out of the lungs is carried out by creating a (i).___ between the lungs and the atmosphere. Inspiration can occur if intra-pulmonary pressure is (ii).___ Expiration takes place when the intra-pulmonary pressure is (iii).___ than the atmospheric pressure. Expiration takes place when the intra-inspiration is initiated by the (iv).___ of diaphragm which (v).___the volume of thoracic chamber in the antero-posterior axis.

A.

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	less	higher	relaxation	increases

B.

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	higher	less	contraction	decrease

C.

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	higher	less	relaxation	decrease

D.

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	less	higher	contraction	increase

Answer: D

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19. Which of the following sequenes is correct to intite inspiration ?

(i) the contraction of external intercostal muscles raises the ribs and sternum

(ii) Volume of thorax increases in the dorso-ventral axis

(iii) intrapulmonary pressure decreases

(iv) Diaphragm contraction

(v) Air rushes into lungs

(vi) Volume of thorax increases in the anterior-posterior axis

A. $(i), (ii), (iv), (v), (iii), (vi)$

B. $(i), (ii), (iii), (iv), (vi), (v)$

C. $(i), (ii), (iv), (vi), (iii), (v)$

D. $(vi), (v), (i), (ii), (iii), (iv)$

Answer: C

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20. Which of the following changes occur in diaphragm and intercostal muscles when expiration of air takes place ?

A. Internal intercostal muscles relex and diaphragm contracts

B. External intercostal muscles and diaphragm relax

C. internal intercostal muscles contract and diaphragm ralax

D. External intercostal muscles and diaphragma contract

Answer: C

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21. During expiration, the diaphragm becomes

A. dome-sphaped

B. oblique

C. concave

D. flattened.

Answer: A

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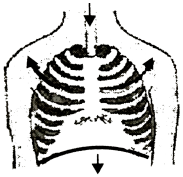
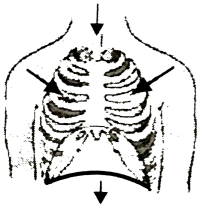
22. Exhalation is the process of expulsion of air through the respiratory tract. Which figure illustrates the process of exhalation ?

(a)

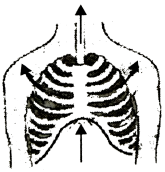


A.

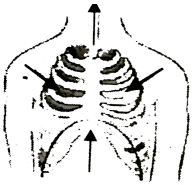
B. (b)



C. (c)



D. (d)



Answer: D

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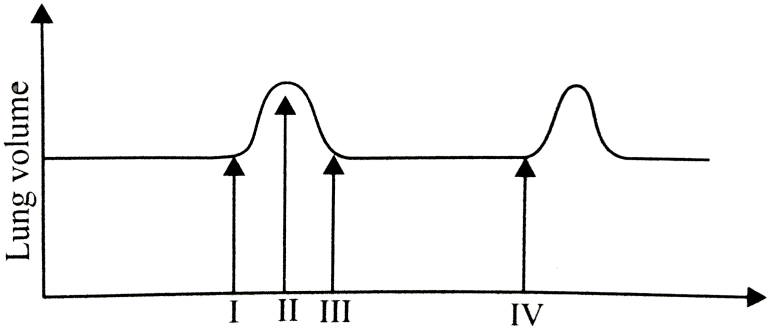
23. The given figure illustrates the changes in lung volume during the process of breathing.



The changes from II to III indicates the

A. movement of diaphragm away from the lungs

B. expansion of the thoracic cavity

C. movement of air out of the lungs

D. expansion of ribs.

Answer: C

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24. Accoding to Boyle's law, the product of pressure and volume is a constant. Hence,

A. If volume of lungs is increased, then pressure decreases proportionately

B. if volume of lungs is increased, then pressure also increases proportionately

C. if volume of lungs is increased, then pressure decreases disproportionately

D. if volume of lungs is increased, then pressure remains the same.

Answer: A

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25. Which of the following statements about the mechanism of ventilation/breathing is incorrect ?

A. As the diaphragm relaxes, air is expelled from the respiratory system.

B. During inspiration the lungs act as suction pump.

C. Inspiration is a passive and expiration is an active process.

D. For quiet breathing, external intercostal muscles and diaphragm play an important role.

Answer: C

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26. A person breathing normally at rest, takes in and expels approximately half a litre of air during each respiratory cucle. This is called

A. inspiratory reserve volume

B. tidal volume

C. expiratory reserve volume

D. vital capacity.

Answer: B

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27. Which one of the following statements is incorrect ?

A. The principal of countercurrent flow facilitates efficient respiration in gills of fishes.

B. The residual air in lungs slightly decreases the efficiency of repiration in mammals.

C. The presence of non-respiratory air sacs, increases the efficiency of respiration in birds.

D. in insects, circulating body fluids serve to distribute oxygen to tissues.

Answer: B

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28. Listed below are four respiratory capacities (i-iv) and four jumpled respiratiory volumes of a normal human adult.

	Respiratory volumes and capacities	Volume of air
(i)	Residual volume	1200 mL
(ii)	Vital capacity	4500 mL
(iii)	Inspiratory reserve volume	2500 mL
(iv)	Inspiratory capacity	3500 mL

A. $(ii)2500mL$, $(iii)4500mL$

B. $(iii)1200mL$, $(iv)2500mL$

C. $(iv)3500mL$, $(i)1200mL$

D. $(i)4500mL$, $(ii)3500mL$

Answer: C

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29. Complete the following sentences by selecting the correct option.

(A) Inspiratory capacity $(IC) =$ ____(i)____ $+ IRV$

(B) $\_\_\_(ii)\_\_\_ = TV + IRV + ERV$

(C) Funcational residual capacity $(FRC) = ERV + \_\_\_(iii)\_\_\_$

A.

(i)	(ii)	(iii)
Vital capacity	Tidal Volume	Residual volume

B.

(i)	(ii)	(iii)
Expiratory capacity	Residual volume	Inspiratory reserve volume

C.

(i)	(ii)	(iii)
Tidal volume	Vital capacity	Residual volume

D.

(i)	(ii)	(iii)
Tidal volume	Total lung capacity	Expiratory capacity

Answer: C

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30. Consider the following statements each with one or two blanks.

(i) Left lung has $\_\_\_(1)\_\_\_$ lobes and right lung has $\_\_\_(2)\_\_\_$ lobes.

(ii) Prawn respires with $\_\_\_(3)\_\_\_$ and insects with $\_\_\_(4)\_\_\_$.

(iiii) Amount of air inhaled and exhaled with maximum effort is referred to as the $\_\_\_(5)\_\_\_$ of the lungs.

Fills up the above blanks by selecting the correct option.

A. (1) - three, (2) - two, (3) - gills (4) - tracheae

B. (1) - two, (2) - three, (5) -vital capacity

C. (3) -gills, (4) - tracheae, (5) - tidal volume

D. (3) - tracheae, (4) - gill, (5) tidal volume

Answer: B

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31. Consider the following statements each with two blanks.

(i) Actually, only about $\_\_(1)\_\_$ mL of air enters the lungs alveoli for the exchange of gases. The remaining fills the respiratory passage and is termed $\_\_(2)\_\_$.

(ii) The amount of air which one can inhale with maximum effort and also exhale with maximum effort is termed as $\_\_(3)\_\_$. It is about $\_\_(4)\_\_$ in normal adult person.

(iii) During normal quiet breathing, on an average, approximately $\_\_(5)\_\_$ mL of air is inspired or expired by adult human male in each breath. It is

termed as $\_\_(6)\_\_$ volume.

Which of the following options gives the correct fill ups for the respective blanks numbers from (1) to (6) in the above statement ?

A. (3)-vital capacity, $(4) - 4000$ mL, $(5) - 500$, $(6) -$ tidal

B. $(1) - 100$, (2)-residual volume, $(3) -$ functional residual capacity, $(4) - 3000mL$

C. $(1) - 350$, (2)-dead space air, $(5) - 1000$, (6)-inspiratory reserve

D. $(1) - 350$, (2)-residual volume, $(3) -$ vital capacity $(4) - 4000mL$

Answer: A

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32. The inspiratory reserve volume $+$ tidal volume $+$ expiratory reserve volume is the same as

A. a) inspiratory capacity $+$ expiratory reserve volume

B. b) total lung capacity $-$ functional residual capacity

C. c) inspiratory capacity $+$ functional residual capacity

D. d) inspiratory capacity $+$ residual volume.

Answer: A

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33. Vital capacity of lungs is

A. $IRV + ERV$

B. $IRV + ERV + TV - RV$

C. $IRV + ERV + Tv + RV$

D. $IRV + ERV + TV.$

Answer: D

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34. After forceful inspiration, the amount of air that can be breathed out by maximum forced expiration is equal to

A. Inspiratory Reserve volume (IRV) + Expiratory Reserve Volume (ERV) + Tidal Volume (TV) + Residual Volume (RV)

B. IRV + RV + ERV

C. IRV + TV + ERV

D. TV + RV + ERV.

Answer: C

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35. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
$A.$	Tidal volume	(i)	$2500-3000mL$of air
$B.$	Inspiratory reserve volume	(ii)	$1000mL$of air
$C.$	Expiratory reserve volume	(iii)	$500mL$of air
$D.$	Residual volume	(iv)	$3400-4800mL$of air
$E.$	Vital capacity	(v)	$1200mL$of air

A. a) A-(iii), B-(iv), C-(ii), D-(i), E-(v)

B. b) A-(iii), B-(i), C-(ii), D-(v), E-(iv)

C. c) A-(iii), B-(i), C-(iv), D-(iv), E-(ii)

D. d) A-(v), B-(i), C-(ii), D-(iii), E-(iv)

Answer: B

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36. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
$A.$	TV + ERV	(i)	$\exp ira \rightarrow ry \cap acity$
$B.$	RV + ERV + TV + IRV	(ii)	Total Lung Capacity
$C.$	ERV + RV	(iii)	Functional Residual Capacity

A. a) $A-(i), B-(ii), C-(iii)$

B. b) $A-(iii), B-(i), C-(ii)$

C. c) $A-(iii), B-(ii), C-(i)$

D. d) $A-(ii), B-(iii), C-(i)$

Answer: A

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37. 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 respires through parapodia.

A.

(i)	(ii)	(iii)	(iv)
T	F	T	F

B. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & F & T & F\end{matrix}$

C. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & T & F & T\end{matrix}$

D. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ T & T & F & F\end{matrix}$

Answer: D

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38. The exchange of gases in the alveoli of the lungs takes place by

A. passive transport

B. active transport

C. osmosis

D. simple diffusion.

Answer: D

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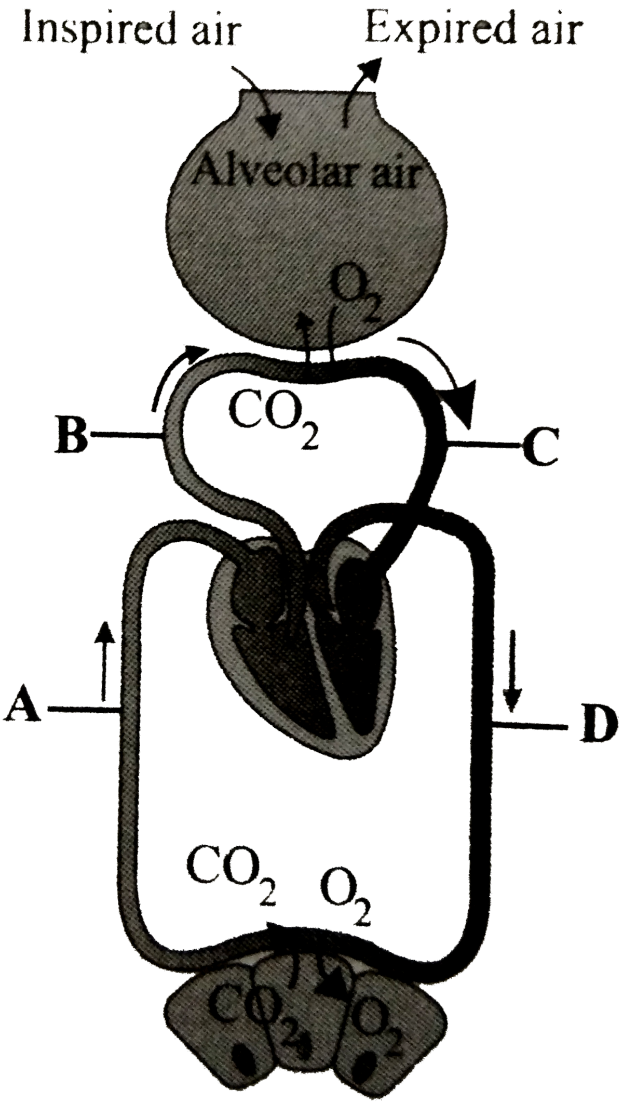
39. The given figure shows the diagrammatic represtation of exchange of gases at the alveolus and the body tissues with blood and trasport of oxygen and carbon dioxide. Identify the blood vessles A to D.



A.

A	B	C	D
Systemic vein	Pulmonary artery	Pulmonary vein	Systemic artery

B.

A	B	C	D
Systemic artery	Pulmonary artery	Pulmonary vein	Systemic vein

C.

A	B	C	D
Pulmonary artery	Systemic vein	Pulmonary vein	Systemic vein

D.

A	B	C	D
Systemic vein	Pulmonary vein	Pulmonary artery	Systemic artery

Answer: A

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40. Consider the following statement each with two blanks.

(i) Diaphragm contrects to help in __(1)__ while the contraction of abdominal muscles help in __(2)__.

(ii) Vital capacity of trained atheles is __(3)__ than that of non-athletes

while the vital capacity of non-smokers is $\underline{\quad(4)\quad}$ than that of smokers.

Which of the follwoing options gives the correct fill ups for the respective blanks numbered from (1) to (6) in the above statements ?

A. a) (1)-expiration, (2)-inspiration, (5)-higher, (6)-lower

B. b) (3)-higher, (4)-lower, 5-lower (6)-higher

C. c) (1)-inspiration, (2)-forced expiration, (3)-higher, (4)-higher

D. d) (1)-expiration, (2)-forced expiration, (5)-higher, (6)-lower

Answer: C

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41. Which of the following would have the same O_2 content?

A. Blood entering the lungs and blood leaving the lungs

B. Blood entering the right side of the heart and blood leaving the right side of the heart

C. Blood entering the right side of the heart and blood leaving the left side of the heart

D. Blood entering the tissue capillaries and blood leaving the tissue capillaries

Answer: B

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42. What is the approximate normal composition of alveolar air ?

A. 14% oxygen, 6% carbon dioxide, 80% nitrogen

B. 21% oxygen, 2% carbon dioxide, 77% nitrogen

C. 16% oxygen, 3% carbon dioxide, 81% nitrogen

D. 10% oxygen, 8% carbon dioxide, 82% nitrogen

Answer: A

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43. The CO_2 content by volume, in the atmospheric air is about

A. $3.34\ \%$

B. $4\ \%$

C. $0.0314\ \%$

D. $2.1\ \%$

Answer: C

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44. Among the following the partial pressure of oxygen is maximum in

A. alveolar air

B. aterial blood

C. venous blood

D. expired air.

Answer: D

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45. In lungs, the air is separated from the venous blood through

A. transitional epithelium + tunica externa of blood vessel

B. squamous epithelium + endothelium of blood vessel

C. squamous epithelium + tunica media of blood vessel

D. none of these

Answer: B

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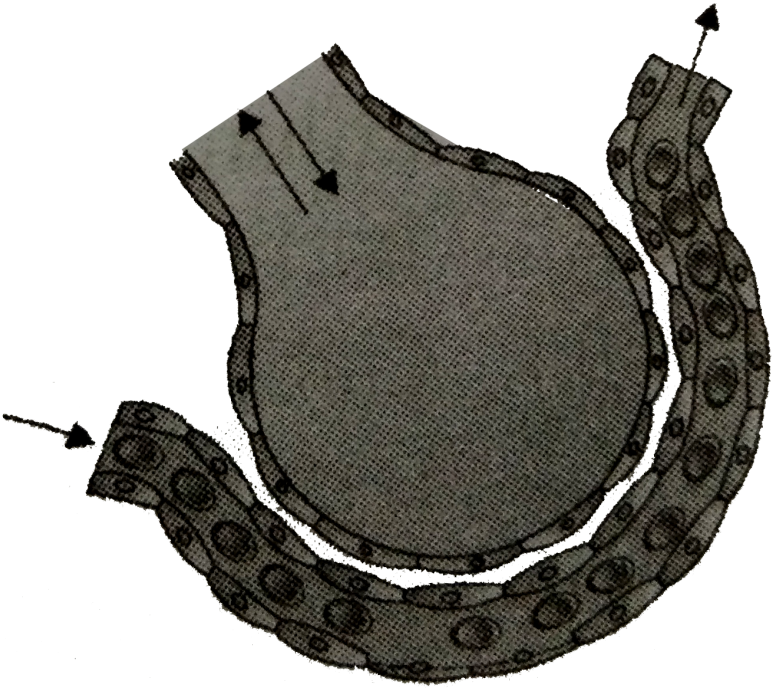
46. The factor which does not affect the rate of alveolar diffusion is



A. solubility of gases

B. thickness of the membranes

C. pressure gradient

D. reactivity of the gases.

Answer: D

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47. Besides RBC, blood plasma also carries O_2 in solution. The percentage is

A. $3 - 9\%$

B. $1 - 2\%$

C. $3 - 6\%$

D. $2 - 3\%$

Answer: D

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48. Which of the following statement is correct?

A. The contraction of internal intercostal muscles lifts up the ribs and sternum.

B. The RBCs transport oxygen only.

C. The thoracic cavity is anatomically an air tight chamber.

D. Healthy men can inspire appromixmately 500 mL of air per minute.

Answer: C

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49. Which of the following statement is true about RBCs in humans?

A. They carry about $20 - 25$ percent of CO_2.

B. They transport 99.5 percent of O_2

C. They transpart about 80 per cent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma.

D. They do not carry CO_2 at all.

Answer: A

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50. The carbon dioxide is transported via blood to lungs mostly

A. in combination with haemoglobin only

B. dissolved in blood plasma

C. in the form of bicarbontes

D. as carbaminohaemoglobin.

Answer: C

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51. Blood carries the CO_2 in three forms. The correct percentages of CO_2 in the these form are

A.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$20-25\ \%$	$70\ \%$	$7\ \%$

B.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$70\,\%$	$20-25\,\%$	$7\,\%$

C.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$20-25\,\%$	$7\,\%$	$70\,\%$

D.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$7\,\%$	$20-25\,\%$	$70\,\%$

Answer: A

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52. Bulk of oxygen diffuses from the plasma into the red blood corpuscles where it joins loosly with Fe^{2+} ions of hemoglobin (Hb) to form bright red oxyhaemoglobin (HbO_2). The process is called

A. oxidation

B. oxgenation

C. hydration

D. dehydrogenation

Answer: B

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53. One haemoglobin carries how many molecules of O_2 ?

A. 4

B. 2

C. 6

D. 8

Answer: A

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54. The oxygen dissociation curve is

A. parabola

B. slope

C. sigmoid

D. stright line.

Answer: C

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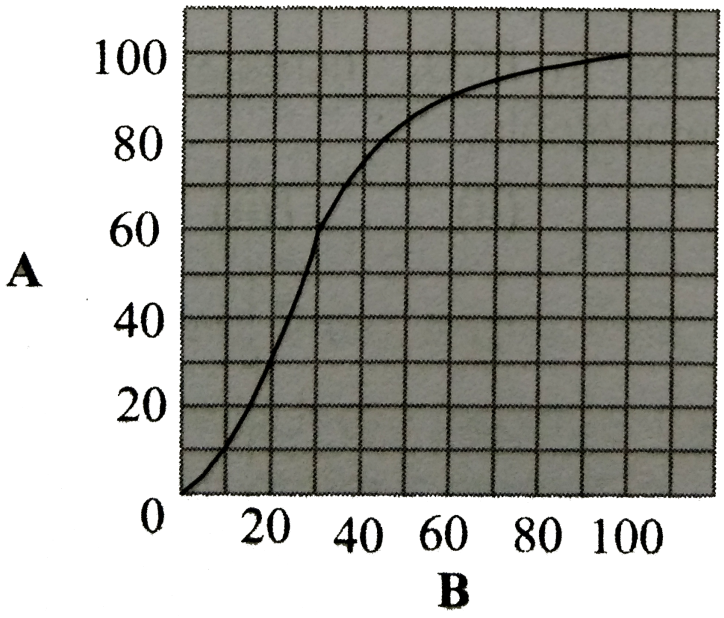
55. Which of the following is incorrect about the given graph ?



A. The curve is called oxygen dissociation curve.

B. The part 'A' represents percentage saturation of haemologbin with oxygen.

C. The part 'B' represents partial pressure of carbon dioxide.

D. This curve is highly useful in studying the effect of factors like PCO_2, H^+ concentration, etc. on binding of CO_2 with haemoglobin.

Answer: C

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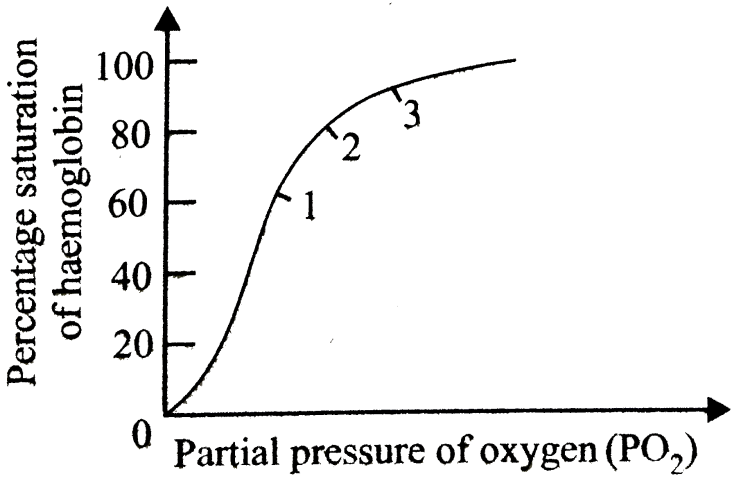
56. The given graph shows an oxygen dissociation curve for haemoglobin.



Wher is the body will haemoglobin be saturated at the percentage shown at point 1, 2 and 3 in graph ?

A. Left ventricle 1 Pulmonary vein 2 Vena cava 3

B. Left ventricle 2 Pulmonary vein 1 Vena cava 3

C. Left ventricle 2 Pulmonary vein 3 Vena cava 1

D. Left ventricle 3 Pulmonary vein 2 Vena cava 1

Answer: C

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57. When temperature decrease, oxy-Hb curve becomes

A. more steep

B. straight

C. parabola

D. none of these

Answer: A

Watch Video Solution

58. Which of the following factors is not favourable for the formation of oxyhaemoglobin ?

A. High PO_2

B. Low temperature

C. Less H^+ concentration

D. High PCO_2

Answer: D

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59. Consider for following four statements and select the correct option starting which ones are true (T) and which ones are flase (F).

(i) Expiration is normally brough about by the relaxation of inspiratory muscles.

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

(iii) A person can expel all the air from the lungs by a forceful expiration.

(iv) A rise in PCO_2 increases the oxygen-affinity of haemoglobin.

A. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & F & T & F\end{matrix}$

B. $\begin{matrix}(\mathrm{i})1 & (ii) & (iii) & (iv) \\ T & T & F & F\end{matrix}$

C. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & T & T & F\end{matrix}$

D. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ T & T & T & F\end{matrix}$

Answer: B

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60. 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

61. A large proportion of oxygen remain unused in the human blood even after its uptake by the body tissues. This O_2

A. acts as a reserve during muscular exercise

B. raises the PCO_2 of blood to $75mm$ of Hg

C. is enough to keeo oxyhaemoglobin saturation at $96\ \%$

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

Answer: A

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62. In the tissues, high concentrations of carbon dioxide

A. increases the affinity of haemoglobin to both oxygen and hydrogen

B. increases the affinity of haemoglobin to oxygen but decreases its affinity to hydrogen

C. decrease the affnitiy to haemoglobin to oxygen but increases its affinity to hydrogen

D. decrease the affinity of haemoglobin to both oxygen and hydrogen.

Answer: C

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63. Fetal haemoglobin has X affinity for oxygen than that of mother's haemoglobin during gestation. X is

A. same

B. higher

C. lower

D. lower affinity earlier but higher later.

Answer: B

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64. 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. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: B

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65. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
$A.$	Tracheoles	(i)	Yeast
$B.$	Carbonic anhydrase	(ii)	Fish
$C.$	Lactic acid	(iii)	Inspiration
$D.$	Fermentation	(iv)	Vital capacity
$E.$	Gill filaments	(v)	Fast muscle
$F.$	Cutaneous respiration	(vi)	Insert
$G.$	Diaphragm	(vii)	Bicarbonates
		$(viii)$	Earthworm

A.

$A-(vi), B-(vii), C-(v), D-(i), E-(ii), F-(vii), G-(iii)$

B.

$A-(viii), B-(iv), C-(vii), D-(i), E-(iii), F-(ii), G-(v$

C.

$A-(vi), B-(i), C-(ii), D-(v), E-(iv), F-(viii), G-(iii)$

D.

$A-(viii), B-(vii), C-(i), D-(iv), E-(ii), F-(vi), G-(v)$

Answer: A

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66. The enzyme that increases the reaction rate between CO_2 and H_2O in red blood cell is

A. carbonic anhydrase

B. adenylate cyclase

C. carbonic synthetase

D. alkaline phosphatase.

Answer: A

Watch Video Solution

67. Which of the following equations is correct ?

A. $CO_2 \rightarrow H_2CO_3 \rightarrow HCO_3^- + H^+$

B. $CO_2 + H_2O \underset{\text{anhydrase}}{\overset{\text{Carbonic}}{\Longleftrightarrow}} H_2C_3 \underset{\text{anhydrase}}{\overset{\text{Carbone}}{\Longleftrightarrow}} H^+ + HCO_3^-$

C. $CO_2 + H_2O \Rightarrow CH_4 + 2O_2$

D. $CO_2 + H_2O \Leftrightarrow CO + H_2O_2$

Answer: B

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68. People living at sea level have around 5 million RBC per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude.

A. people eat more nutritive food, therefore more RBCs are formed

B. people get pollution-free air to breathe and more oxygen is available

C. atmospheric O_2 level is less and hence more $RBCs$ are needed to abosorb the required amount of O_2 to survive

D. there is more UV radiation which enhances RBC production.

Answer: C

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69. During CO_2 transport, HCO_3^- diffuses from erythrocytes to plasma and in turn upsets the ionic balance momentraily. In order to keep the ionic balance, an equal number of Cl^- pass into the erythrocyes from plasma. The process is known as

A. Hamburger phenomenon

B. bicarbonate shift

C. carbonation

D. Bohr's effect.

Answer: A

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70. 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 by blood.

D. Only carbon dioxide is transported by blood.

Answer: B

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71. Which of the following is ture for CO_2 concentration ?

A. More in alveolar air than in expired air

B. More in expired air than in alveolar air

C. More in inspired air than in alveolar air

D. More in inspired air than in expired air

Answer: A

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72. 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

Answer: D

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73. Although much CO_2 is carried in blood, yet blood does not become acidic, because

A. a) CO_2 is absorbed by the leucocytes

B. b) Oxygen combines with haemoglobin to form oxyhaemoglobin

C. c) CO_2 transport and blood buffers play an important role in it

D. d) it is continously diffused through the tissues and is not allowes to accumulate.

Answer: C

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74. Haldane effect plays more important role in promoting carbon dioxide tranport than that of the Bhr's effect in promoting oxygen trasnport because

A. oxyhaemoglobin is a stronger acid which donates hydrogen ion $\left(H^+\right)$ which in turn displace carbone dioxide from blood

B. carbaminohaemoglobin is a stronger acid which spilts into hydrogen ion $\left(H^+\right)$ and bicarbonate $\left(HCO_3^-\right)$

C. carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue

D. carbon dioxide is less soluble in venous blood than in arterial blood.

Answer: A

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75. During rest, the metabolic needs of the body are at their minimum. Which of the following Is indicative of this situation ?

A. Rate of breathing

B. O_2 intake CO_2 output

C. Pulse rate

D. All of these

Answer: D

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76. Match column I with column II and select the correct option from the given codes ?

	Column I		Column II
$A.$	Trachea	(i)	PO_2in alveolar air
$B.$	Respiratory centre	(ii)	ATP
C	Yeast	(iii)	Cartilaginous rings
$D.$	Insects	(iv)	MEdulla oblongata
$E.$	Fish	(v)	Larynx
$F.$	Biologically useful energy	(vi)	Tracheal respiration
$G.$	100mm Hg	(vii)	Ethanol
$H.$	Vocal cords	(vii)	Branchial respiration

A.

$A-(iii), B-(iv), C-(vii), D-(vi), E-(vii), F-(ii), G-(i$

B.

$A-(v), B-(ii), C-(vii), D-(viii), E-(vi), F-(iv), G-(i)$

C.

$A-(vi). B-(iv), C-(viii), D-(v), E-(i), F-(ii), G-(iii)$

D.

$$A-(i), B-(v), C-(vii), D-(iii), E-(viii), F-(ii), G-(iv$$

Answer: A

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77. Pneumotaxic center which can moderate the functions of the respiratory rhythm center is present in

A. pons region of brain

B. thalamus

C. spinal cord

D. right cerebral hemisphere.

Answer: A

Watch Video Solution

78. Match column I with column II an select the correct option from the codes given below.

Column I	Column II
A. Carbomino-heamoglobin	(i) Inspiration
B. Diaphragm	(ii) Hamburger's phenomenon
C. Larynx	(iii) Diffusion of Cl^- into RBC
D. Pons varolii	(iv) Carbon dioxide
E. Chloride shift	(v) Cartilages
	(vi) Pneumotaxic centre
	(vii) Expiration

A. a) $A-(iv), B-(i), (vii), C-(v), D-(vi), E-(ii), (iii)$

B. b) $A-(v), B-(i), C-(iv), (vii), D-(vi), E-(ii), (iii)$

C. c) $A-(ii), (vi), B-(i), C-(iii), D-(v), (vii), E-(iv)$

D. d) $A-(iii), B-(i), C-(ii), (v), D-(vi), (vii), E-(iv)$

Answer: A

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79. Chemosensitive area of respiratory centre in medulla is affected by

A. less CO_2 and H^+ ions

B. less O_2 and H^+ ions

C. excess CO_2 and H^+ ions

D. excess O_2 and H^+ ions

Answer: C

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80. Fill up the blanks in the following paragraph by selecting the correct option.

Human beings have a significant ability to maintain and moderate the respiratory rhythm to suti the demands of the body tissues. This is done by the neural system. A specialised centre present in the medulla region of the brain called ___(i)___ is primarily responsible for this regulation. Another centre present in the pons region of the brain called ___(ii)___ can moderate the functions of the repiratory rhytm cenre. Neutral signal from this cenre cen reduce the duration of ___(iii)___ and thereby alter the

respiratory rate. A ___(iv)___ is situated adjacent to the rhythm centre which is highly sensitive to CO_2 and hydrogen ions.

A.

(i)	(ii)	(iii)	(iv)
Chemosensitive area	Respiratory rhythm centre	Expiration	Pneu

B.

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Pneumotaxic centre	Inspiration	Cher

C.

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Chemosensitive area	Expiration	Pneu

D.

(i)	(ii)	(iii)	(iv)
Pneumotaxic centre	Chemosensitive area	Inspiration	Respirator

Answer: B

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81. Rate of breathing is controlled mainly by

A. CO_2 is level in blood

B. pH in blood

C. O_2 level in blood

D. O_2 level and pH in blood.

Answer: A

Watch Video Solution

82. The respiratory centre in the brain is stimulate by

A. CO_2 concentration in venous blood

B. O_2 concentration in arterial blood

C. CO_2 concentration in arterial blood

D. O_2 concentration in venous blood

Answer: C

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83. Complete the following sentence by selecting the correct option.

Receptors associtated with aortic arch and carotid artery can recognise changes in $\_\_(i)\_\_$ and $\_\_(ii)\_\_$ concentration and send necessary signals to $\_\_(iii)\_\_$ for remedial actions.

A. (i) (ii) (iii)
O_2 CO_2 pneumotaxic centre

B. (i) (ii) (iii)
CO_2 H^+ rhythm centre

C. (i) (ii) (iii)
CO_2 H^+ apneustic centre

D. (i) (ii) (iii)
O_2 H^+ pneumotaxic centre

Answer: B

Watch Video Solution

84. Complete the following sentence by selecting the correct option.

the breathing rhythm is generated in the $\_\_(i)\_\_$ and is influenced by variation in levels of $\_\_(ii)\_\_$ in the blood.

A. (i) (ii)
medulla CO_2

B. (i) (ii)
medulla O_2

C. (i) (ii)
frontal lobe CO_2 and O_2

D. (i) (ii)
frontal lobe CO_2

Answer: A

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85. When CO_2 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: D

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86. Statement I : Rate of breathing 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. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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87. Read the following four statement (i) - (iv) with certain mistakes in two of them.

(i) A water breather expends much more energy in ventilating its

respiratoru surface than an air-breathing one.

(ii) Lungs become empty after forceful expiration.

(iii) Exchange of gases in the lungs are interrupted during expiration.

Respiratory movement are controlled by CO_2 concentration of arterial blood.

Which of the above two statements have mistakes ?

A. (i) and (iv)

B. (ii) and (iii)

C. (i) and (ii)

D. (iii) and (iv)

Answer: B

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88. Human beings have a significant ability to maintain and moderate the respiratory rhythm to suit demands of the body. For it we have

Respiratory rhythm centre in medulla -R

Pneumotaxic centre in pons -RT

Chemosensitive area in medulla -C_1

Peripheral chemoreceptors in aortic arch and carotid artery -C_2

Find out the correct path for regulation of respiration.

A. $C_2 \rightarrow R \rightarrow RT \rightarrow C_1$

B. $RT \rightarrow \underset{\uparrow}{R} \leftarrow C_2$
C_1

C. $C_1 \rightarrow \underset{\uparrow}{RT} \rightarrow C_2$
R

D. $RT \rightarrow \underset{\uparrow}{C_2} \rightarrow C_1$
R

Answer: B

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89. The urge to inhale in humans results from

A. rising PCO_2

B. rising PO_2

C. falling PCO_2

D. falling PO_2

Answer: A

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90. Read the following four statement carefully.

(i) Ventral respiratory group of neurons of medulla oblongata can cause both inspiration and expiration.

(ii) The part of the respiratory system starting with the external nostrils up to the terminal bronchioles constitutes the respiratory or exchange part of the respiratory system.

(iii) During swallowing epiglottis can be covered by a thin elastic cartilaginous flap called glottis to prevent the entry of food into the larynx.

(iv) Binding of oxygen with haemoglobin in primarily related of oxygen with haemoglobin is primarily related to partial prssure of O_2.

Which of the above two statement are correct ?

A. a) (ii) and (iii)

B. b) (iii) and (iv)

C. c) (i) and (ii)

D. d) (i) and (iv)

Answer: D

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91. Emphysema is a condition resulting from

A. cigarette smoking

B. liquor consumption

C. durg addiction

D. reduced oxygen carrying capacity of blood.

Answer: A

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92. Which one of the following is the incorrect 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 respiratory rate.

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

D. None of these

Answer: D

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93. Given below are few respiratory disorders. Identify occupational respiratory disorders among these.

(i) Coryza , (ii) SARS

(iii) Silicosis , (iv) Asbestosis

(v) Emphysema

A. (i) and `(ii)

B. (i) and (v)

C. (iii) and (iv)

D. (i), (ii) and (v)

Answer: C

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94. Which of the following statements is correct ?

A. During inspiration external intercostal muscles and diaphragm contract.

B. Cyanosis mean collapse of alveoli.

C. Eupnea is slow breathing.

D. Coryza is caused by human coronavirus.

Answer: A

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95. Following are few characters of a disorder from the choices give below.

A. Diphtheria

B. Rhinitis

C. Bronchial carcinom

D. Emphysema

Answer: B

View Text Solution

96. Visiting high mountains may cause altitude sickness in men living in plan areas. Prime of this is

A. excess of CO_2 in blood

B. decreased efficiency of haemoglobin

C. decreased partial pressure of oxygen

D. decreased efficiency of red blood cells.

Answer: C

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97. Carbon monoxide can kill a person because of it's extermely high affinity for

A. haemoglobin

B. phytochrome

C. cytochrome

D. none of these

Answer: A

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98. The toxic effect of carbon monoxide is due to its greater affinity for haemoglobin as compared to oxygen approximately by

A. 200 times

B. 1000 times

C. 2 times

D. 20 times

Answer: A

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99. Blood analysis of a patient reveals an ususually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct ?

A. carbon disulphide

B. chloroform

C. carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue

D. carbon monoxide.

Answer: D

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100. During winter a person died during sleep, the room was closed and a container with burnt charcoal was found in the room. What may be the possible reason of his death ?

A. Non-availability of oxygen

B. Hb has more affinity to combine with carbon monoxide

C. Hb has more affinity to combine with carbon dioxide

D. Combined effect of both (a) and (c)

Answer: B

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101. Assertion : Vocal cords consists of three pairs of mucous membrane that extend into the lumen of the larynx.

Reason : Sound is produced by only two pairs of cords.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

Watch Video Solution

102. Assertion : Tracheae, primary, secondary and tertiary bronchi are supported by incomplete carilaginous rings.

Reason : These rings of carilage make the wall non-collapsible.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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103. Assertion : The lungs are situated in thoracic chamber which is anatomically an air-tighlt chamber.

Reason : Such an arrangement is essential to avoid an change in pulmonary volume.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

Watch Video Solution

104. Assertion : The abdominal muscles are primarily involved in generating pressure gradient between the lungs and the atmosphere.

Reason : The strength of inspiration and expiration can be increased by abdiminal muscles in diaphragm and intercostal muscles.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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105. Assertion : If two men, expire the same volume of air after normal inspiration, they have the same expiratory capacity.

Reason : Expiratory capacity includes tidal volume and inspiratory reserve volume.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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106. Assertion : Alveoli are the primary sites for exchange of gases.

Reason : All factors in our body are favourable for diffusion of O_2 from alveoli to tissues and that of CO_2 from tissues to alveoli.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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107. Assertion : A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the PO_2.

Reason : Every 100 mL of oxygenated blood can deliver around $5mL$ of O_2 to the tissues under normal physiological conditions.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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108. Assertion : A rise in PCO_2, H^+ ions and temperature shifts the HbO_2 dissociation curve to right.

Reason : A rise in PCO_2 or fall in pH decreases oxygen affinity for haemoglobin.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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109. Assertion : At the tissue level, 70 percent of CO_2 formed from contabolism is trapped as bicarbonate in the RBCs.

Reason : At tissue level, carbonic anhydrase in RBCs facilites the formation of CO_2 and H_2O from bicarbonate.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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110. Assertion : Chloride shift is exchange of Cl^- of plasma and HCO_3^- of RBCs.

Reason Chloride shift, maintains an acid base balance between the RBC's and plasma.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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111. Assertion : The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

Reason : Increased PCO_2 and H^+ concentration inputs from chemoreceptors can activate respirotory rhytm centre to make necessary adjustments.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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112. Assertion : Pneumotaxic centre, located in the medulla region of the brain, moderates the respiratory rhythm centre.

Reason : Pneumotaxic centre controls the switch $'ON'$ point of inspiration.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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113. Assertion : Emphysema is the permanent abnormal inflation of air space of terminal bronchioles or alveolar sacs.

Reasons : Destruction of pulmonary tissues specially alveolar septa and flattening of alveolar ducts occur in emphysema.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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114. Asertiion : Inspirations occurs when there is a negative pressure in the lungs with respect to the atmospheric pressure.

Reason : During inspiration, a decrease in pulmonary volume increases the intre-pulmonary pressure than atmospheric pressure which forces the air from outside to moe into the lungs.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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115. Assertion : Asthma is a difficulty in breathing caushing wheezing.

Reason : Asthma occurs due to inflammation of bronchi and bronchioles.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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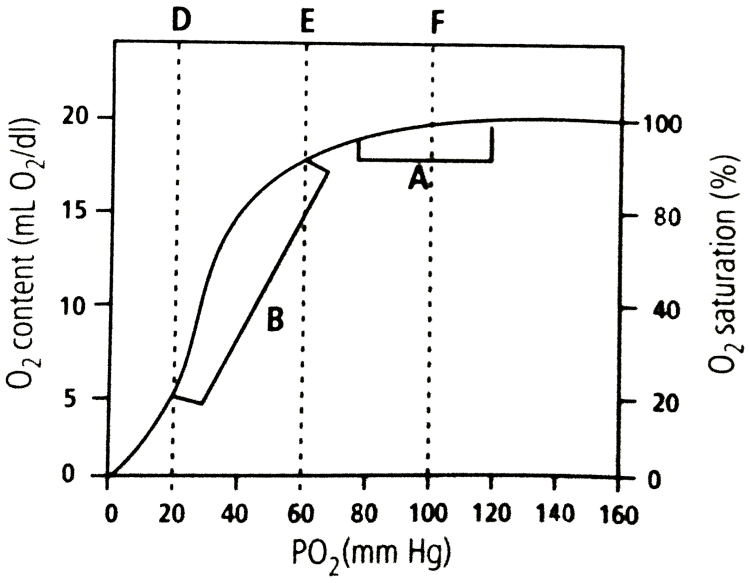
Higher Order Thinking



1.

Blood can combine with almost _____ of oxygen if the haemoglobin is 100 per cent saturated.

A. 18 mL

B. 15 mL

C. 20 mL

D. 10 mL

Answer: C

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2. 

Which of these is incorrect regarding A and B in the given graph ?

A. A is deoxygenated blood leaving the tissues.

B. B is reduced blood returning from tissues.

C. A is oxygenated blood leaving the lungs.

D. B is deoxygenated blood in the systemic veins.

Answer: A

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3. 

Which of these is correct regarding D, E and F areas in the graph ?

A. D shows venous blood in exercise.

B. E shows normal venous blood

C. F shows normal arterial blood.

D. All of these

Answer: B

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4.

How much oxygen will be released to the tissues by blood on passing from lungs to tissues ?

A. 15 mL of O_2 / 100 mL of blood

B. 70 mL of O_2 / 100 mL of blood

C. 5 mL of O_2 / 100 mL of blood

D. 20 mL of O_2 / 100 mL of blood

Answer: C

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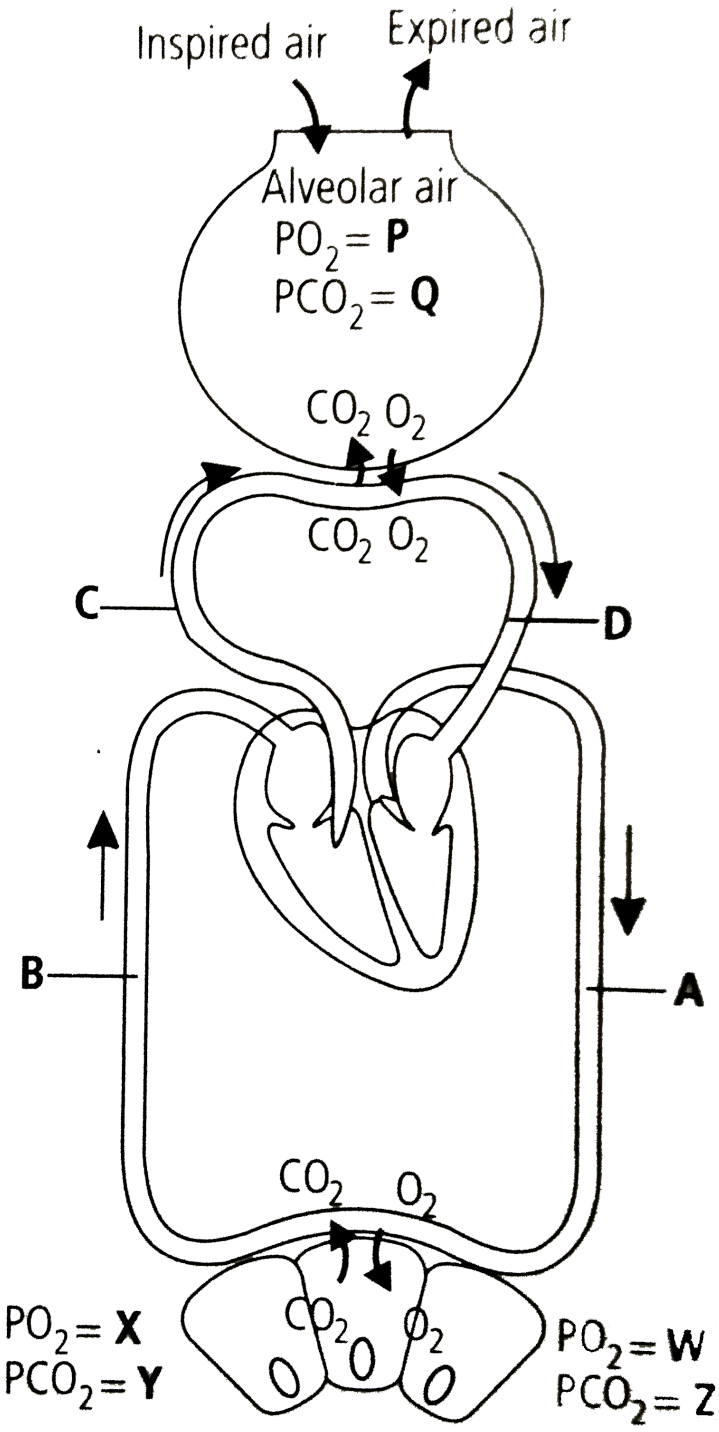

5.

Durning strenuous exercise, the muscle interstitial fluid pO_2 falls to 20

During strenuous exercise, the muscle interstitial fluid pO_2 falls to 20 mm Hg. The oxygen delivered by blood that passes through the exercising muscle tissus will be

A. five times as much as normal

B. double to the normal

C. three times as much as normal

D. none of these.

Answer: C

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6. 

What is the labelled blood vessels A, B, C or D carries oxygenated blood ?

A. A and B

B. B and C

C. A and D

D. B and D

Answer: C

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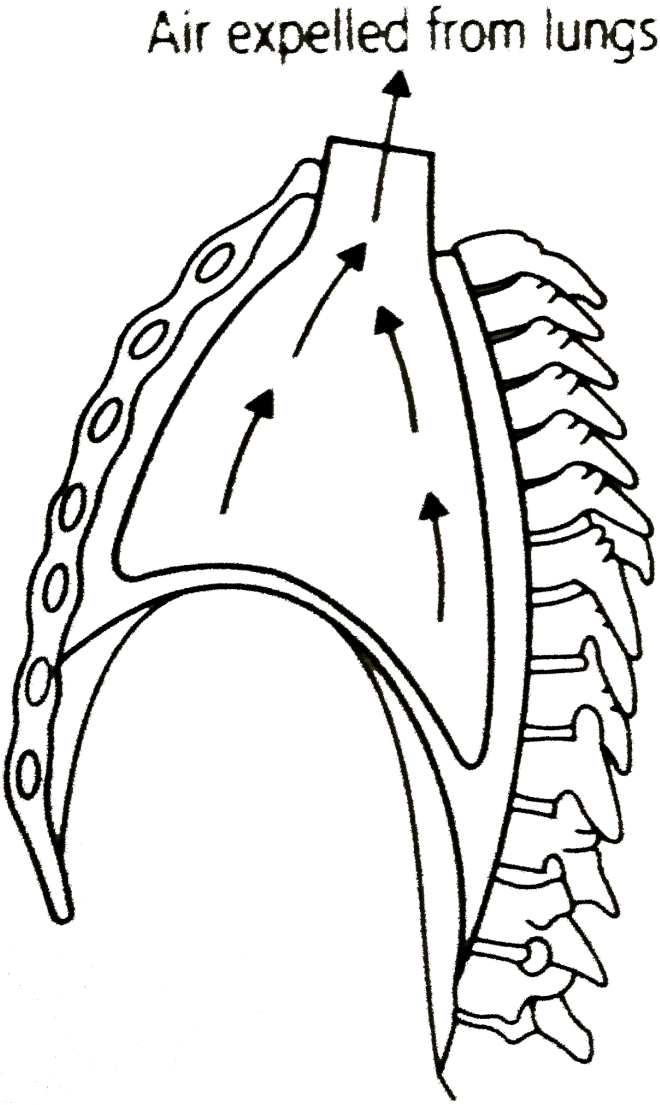

7.

What is the value of W, X, Y and Z normally (in mmHg) ?

A. a)

W	X	Y	Z
95	40	45	40

B. b)

W	X	Y	Z
95	40	40	45

C. c)

W	X	Y	Z
40	45	95	40

D. d)

W	X	Y	Z
95	45	40	40

Answer: A

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8.

Which of these is incorrect regarding the given mechanism of breathing ?

A. Volume of thorax decreases

B. Ribs and sternum are raised

C. Diaphragm relaxes and arches upwards

D. All of these

Answer: B

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9. 

In the given mechanism, diaphragm, sternum and intercostal muscles work work together to _____ the thoracic volume and thereby pulmonary volume. This lead to _____ in intra-pulmonary pressure to slightly _____ the atmospheric pressure, causing expiration.

Select the correct sequnence of words to complete the above paragraph ?

A. decrease, decrease, below

B. increase, decrease, above

C. decrease, increase, above

D. increase, increase, below

Answer: C

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10. If $P_{atm} = 0mmHg$ and $P_{alv} = -2$ mm Hg, then

A. It is the end of the normal inspiration and there is no airflow

B. it is the end of the normal expiration and there is no airflow

C. transpulmonary pressure (P_{tp}) is -2 mm Hg

D. air is flowing into the lungs.

Answer: D

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11. If alveolar ventilation is $4200mL/\min$, respiratory frequency is 12 breaths per minute, and tidal volume is 500 mL, what is the anatomical-dead-space ventialtion ?

A. $1800\text{mL}/\text{min}$

B. $6000\text{mL}/\text{min}$

C. $350\text{mL}/\text{min}$

D. $1200 \mathrm{mL} / \mathrm{min}$

Answer: A

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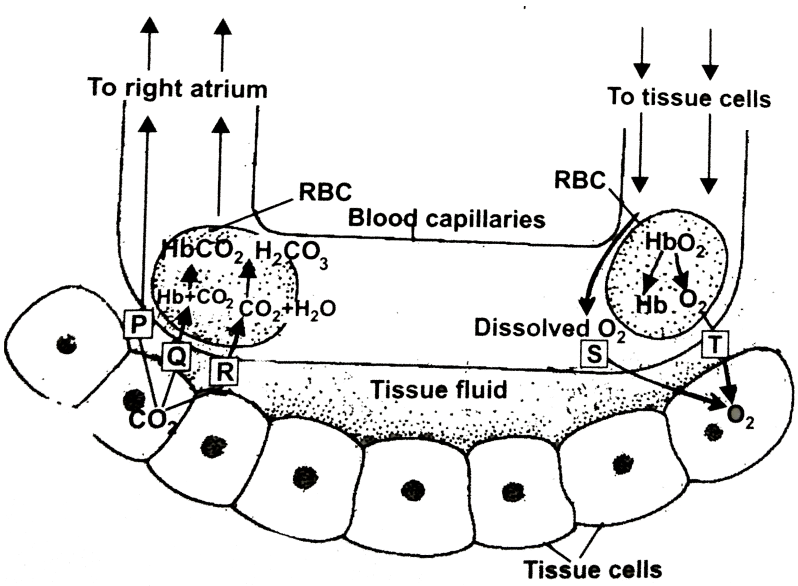
12. Refer to the given diagrammatic representation of the transportation of oxygen and carbon dioxide in the blood. P, Q, R, S and T represent percentage of both gases in different forms. Select the correct option for $P - T$.



A. a)

P	Q	R	S	T
$23\ \%$	$70\ \%$	$7\ \%$	$93\ \%$	$7\ \%$

B. b)

P	Q	R	S	T
7 %	23 %	70 %	3 %	97 %

C. c)

P	Q	R	S	T
7 %	23 %	70 %	97 %	3 %

D. d)

P	Q	R	S	T
70 %	7 %	23 %	97 %	3 %

Answer: B

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Exemplar Problems

1. Respiration in insects Is called direct because

A. the cells 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 the air outside thorugh body surface

D. tracheal tubes exchange O_2 / CO_2 directly with the haemocoel which then exchange with tissues.

Answer: A

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2. A person surffers punctures in his chest cavity in an accident, without any damage t 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

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3. 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. it increases CO_2 transport

D. it increases O_2 transport.

Answer: B

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4. 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 proces whereas expiration is passive.

C. Inspiration and expiration are active processes.

D. Inspiration and expiration are passive processes.

Answer: B

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5. 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:

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6. Mark the correct pair of muscles involved in the normal breathing in humans.

A. External and internal intercostal mucles

B. Diaphragm and abdominal muscles

C. Diaphragm and external intercostal muscles

D. Diaphragm and intercostal muscles

Answer: D

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

A. the bronchioles are found damaged

B. the alveolar walls are found damaged

C. the plasma membrane is found damaged

D. the respiratory muscles are found damaged.

Answer: B

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8. Respiratory process is regulated by certain specialised 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

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9. CO_2 dissociates 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

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10. In breathing movements, air volume can be estimated by

A. stethoscope

B. hygrometer

C. sphygmomanometer

D. spirometer.

Answer: D

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11. 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

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12. 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^+ concentrations

Answer: A

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13. Match the following and mark the correct options.

A. $A-(ii), B-(i), C-(iv), D-(iii)$

B. $A-(i), B-(iv), C-(ii), D-(ii)$

C. $A-(i), B-(iii), C-(ii), D-(iv)$

D. $A-(i), B-(ii), C-(iv), D-(iii)$

Answer:

View Text Solution

Breathing And Exchange Of Gases

1. Statement 1 : Respiration is most efficient in the insects, among the invertebrates.

Statement 2 : In the insects, air is carried directly to the cells by tracheoles.

A. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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2. Read the given statements characterizing certain types of animals. Select the option which correctly exemplifies each of these types.

(i) Animal having external gills

(ii) Animal having internal gills

(iii) Animal showing tracheal respiration

(iv) Animal revealing buccopharyngeal respiration

A.

(i)	(ii)	(iii)	(iv)
Prawn	Arenicola	Unio	*Fish*

B.

(i)	(ii)	(iii)	(iv)
Necturus	Unio	Prawn	*Frog*

C.

(i)	(ii)	(iii)	(iv)
Pila	Arenicola	Unio	Toad

D.

(i)	(ii)	(iii)	(iv)
Necturus	Pila	Milipede	Toad

Answer: D

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3. Match column I with column II and select the correct option from the given codes.

Column I (Animals)	Column II (Respirartory structures)
A. Pigeon	(i) Book gills
B. Scorpion	(ii) Pharyngeal wall
C. Planaria	(iii) Lungs
D. Earthworm	(iv) Gilles
E. Spiders	(v) Book lungs
F. King crab	(vi) Body surface
G. Prawn	(vii) Skin
H. Labeo	

A.

$$A-(iii), B-(v), C-(vi), D-(vii), E-(v), F-(i), G-(iv),$$

B.

$$A-(v), B-(ii), C-(vi), D-(vii), E-(vi), F-(iv), G-(i),$$

C.

$A-(vi), B-(iv), C-(vi), D-(v), E-(i), F-(ii), G-(iii),$

D.

$A-(i), B-(vi), C-(vii), D-(iii), E-(vii), F-(ii), G-(iv$

Answer: A

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4. Which structure of man is similar to spiracle of cockroach?

A. Nostril

B. Bronchiole

C. Lung

D. Alveolus

Answer: A

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5. Which of the following option is incorrect about the larynx (sound box) ?

A. (a) It is a bony box

B. (b) Glottis is the opening into the larynx.

C. (c) During swallowing of food glottis is covered by epiglottis to prevent food entry into the larynx.

D. (d) All of these

Answer: A

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6. Which of the following structures close the glottis during swallowing to prevent the entry of food wind pipe

A. Tongue

B. Epiglottis

C. Diaphragm

D. Larynx

Answer: B

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7. In man and mammals, air passes from outside into the lungs through

A. nasal cavity, larynx, pharynx, trachea, bronchi, alveoli

B. nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli

C. nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli

D. nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli

Answer: D

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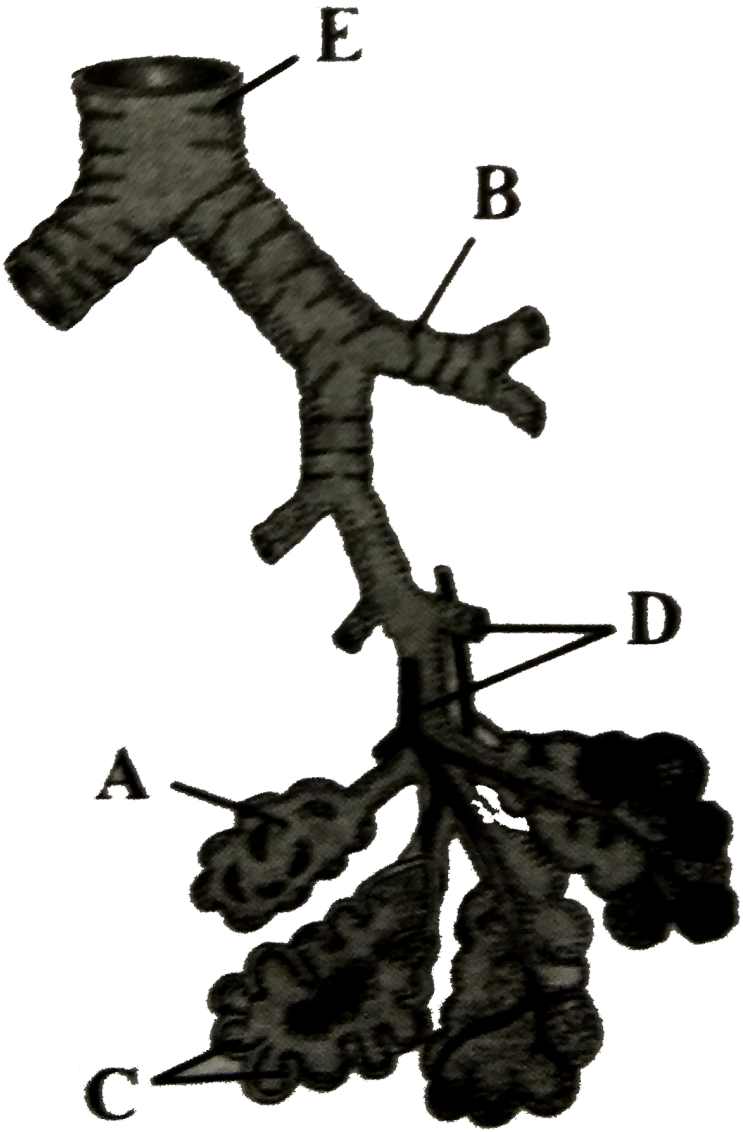
8. Study the given figure of respiratory passage carefully and identify the parts labelled as A, B, C, D and E.



A.

A	B	C	D	E
Alveolar sac	secondary brounchus	Alveoli	Bronchioles	Trachea

B.

A	B	C	D	E
Alveoli	secondary brounchus	Alveolar sac	Trachea	Bronchioles

C.

A	B	C	D	E
Alveolar sac	Tertiary brounchus	Alveoli	Trachea	Bronchioles

D.

A	B	C	D	E
Alveoli	Tertiary brounchus	Alveolar sac	Bronchioles	Trachea

Answer: A

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9. Mammalian lungs have an enormous number of minute alveoli (air sacs). This is to allow

A. more surface area for difusion of gases

B. more space for increasing the volume of inspired air

C. more nerve supply to keep the lungs working

D. more spongy texture for keeping lung in proper shape.

Answer: A

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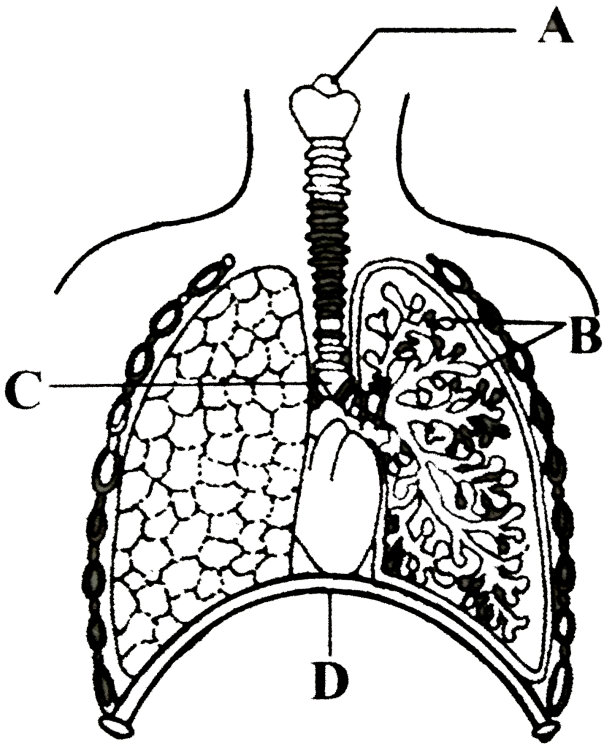
10. The given figure shows the diagrammatic view of human respiratory system. Identify A, B, C and D.



A. A-Epiglottis, B-Alveoli, C-Bronchus, D-Diaphragm

B. A-Epiglottis, B-Alveoli, C-Bronchioles, D-Diaphragm

C. A-Soundbox, B-Alveoli, C-Brounchus, D-Diaphragm

D. A-Larynx, B-Alveoli, C-Brounchioles, D-Diaphragm

Answer: A

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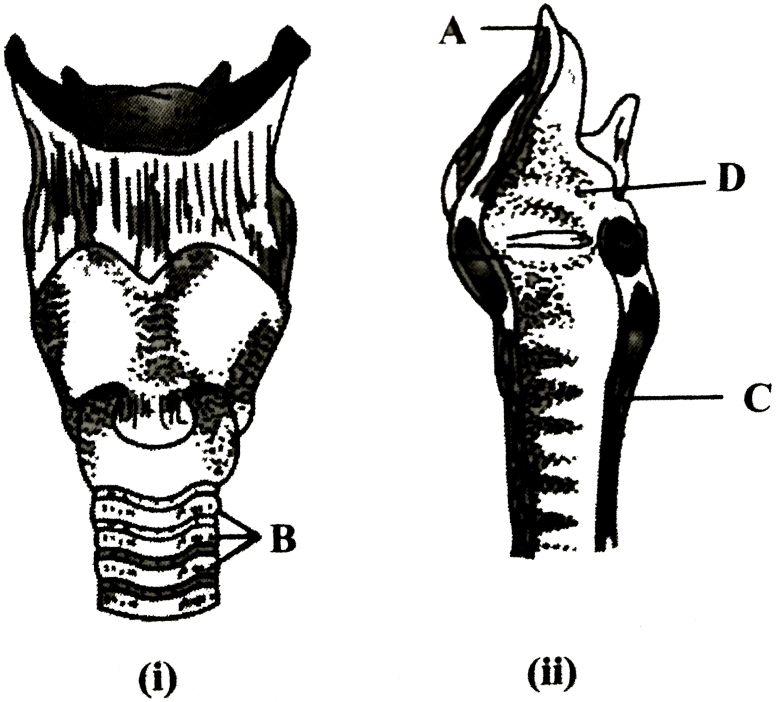
11. The given figures are of human larynx, front view (i) and vertical section (ii).



Identify the labelled parts A to D.

A. (A) Glottis (B) Larynx (C) Vocal cord (D) Cartilaginous rings of trachea

B. (A) Epiglottis (B) Cartilaginous rings of trachea (C) Trachea (D) Larynx

C. (A) Glottis (B) Cartilaginous rings of trachea (C) Larynx (D) Trachea

D. (A) Epiglottis (B) Bony rings of trachea (C) Larynx (D) Trachea

Answer: B

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12. Lungs are enclosed in

A. perichondrium

B. pericardium

C. pleural membrane

D. peritoneum.

Answer: C

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13. Thoracic chamber is formed dorsally by the $\underline{(i)}$, vertrally by the $\underline{(ii)}$, laterally by the $\underline{(iii)}$ and on lower side by the dome shaped $\underline{(iv)}$.

Select the correct option to complete the above paragraph.

A. (i) vertebral column (ii) sternum (iii) ribs (iv) diaphragm

B. (i) sternum (ii) vertebral column (iii) diaphragm (iv) ribs

C. (i) diaphragm (ii) ribs (iii) vertebral column (iv) sternum

D. (i) ribs (ii) diaphragm (iii) vertebral column (iv) sternum

Answer: A

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14. Given below is a list of different steps (i-vi) involved in respiration.

(i) Utilisation of O_2 by the cells for catabolic reactions.

(ii) Transport of gases by the blood.

(iii) Pulmonary ventilation by which atmospheric air is drawn in and CO_2 is released out.

(iv) Release of resultant CO_2.

(v) Diffusion of O_2 and CO_2 between blood and tissues.

(vi) Diffusion of gases (O_2 and CO_2) across alveolar tissues.

Select an option which has correct sequence of all the steps.

A. $(iii), (vi), (ii), (v), (i), (iv)$

B. $(iii), (vi), (i), (v), (ii), (iv)$

C. $(iv), (ii), (v), (iii), (i), (vi)$

D. $(iv), (vi), (ii), (v), (i), (iii)$

Answer: A

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15. Inspiration occurs when there is a negative pressure in the lungs with respect to atmospheric pressure. This negative pressure is achieved when

A. intrapulmonary pressure is less than the atmospheric pressure

B. Intrapulmonary pressure is greater than the atmospheric pressure

C. intrapulmonary pressure is equal to the atmospheric pressure

D. intrapleural pressure becomes more than the intra-alveolar pressure.

Answer: A

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16. Statement 1 : Mammals can eat while breathing.

Statement 2 : Mammals have negative-pressure breath-ing.

A. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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17. The ventilation movements of the lungs in mammals are governed by

A. muscular walls of lung

B. diaphram

C. costal muscles

D. both (b) and (c)

Answer: D

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18. Fill up the blanks in the following paragraph by selecting the correct option.

The movement of air into and out of the lungs is carried out by creating a (i).___ between the lungs and the atmosphere. Inspiration can occur if intra-pulmonary pressure is (ii).___ Expiration takes place when the intra-pulmonary pressure is (iii).___ than the atmospheric pressure. Expiration takes place when the intra-inspiration is initiated by the (iv).___ of diaphragm which (v).___the volume of thoracic chamber in the antero-posterior axis.

A.

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	less	higher	relaxation	increases

B.

(i)	(ii)	(iii)	(iv)	(v)
concentration gradient	higher	less	contraction	decrease

C.

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	higher	less	relaxation	decrease

D.

(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	less	higher	contraction	increase

Answer: D

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19. Which of the following sequenes is correct to intite inspiration ?

(i) the contraction of external intercostal muscles raises the ribs and sternum

(ii) Volume of thorax increases in the dorso-ventral axis

(iii) intrapulmonary pressure decreases

(iv) Diaphragm contraction

(v) Air rushes into lungs

(vi) Volume of thorax increases in the anterior-posterior axis

A. $(i), (ii), (iv), (v), (iii), (vi)$

B. $(i), (ii), (iii), (iv), (vi), (v)$

C. $(i), (ii), (iv), (vi), (iii), (v)$

D. $(vi), (v), (i), (ii), (iii), (iv)$

Answer: C

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20. Which of the following changes occur in diaphragm and intercostal muscles when expiration of air takes place ?

A. Internal intercostal muscles relex and diaphragm contracts

B. External intercostal muscles and diaphragm relax

C. internal intercostal muscles contract and diaphragm ralax

D. External intercostal muscles and diaphragma contract

Answer: C

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21. During expiration, the diaphragm becomes

A. dome-sphaped

B. oblique

C. concave

D. flattened.

Answer: A

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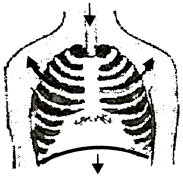
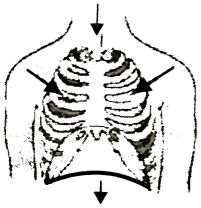
22. Exhalation is the process of expulsion of air through the respiratory tract. Which figure illustrates the process of exhalation ?

(a)

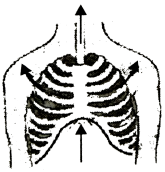


A.

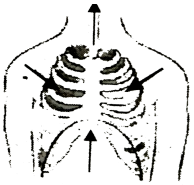
B. (b)



C. (c)



D. (d)



Answer: D

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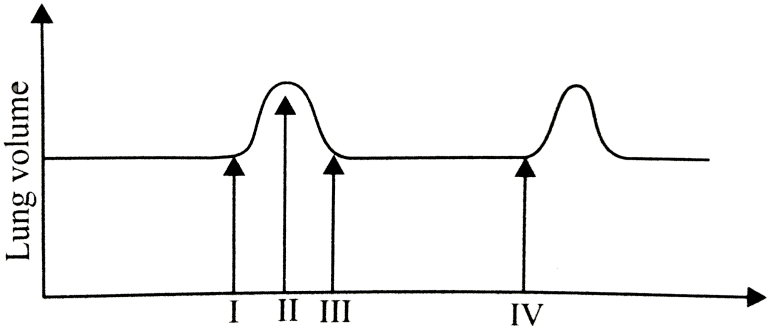
23. The given figure illustrates the changes in lung volume during the process of breathing.



The changes from II to III indicates the

A. movement of diaphragm away from the lungs

B. expansion of the thoracic cavity

C. movement of air out of the lungs

D. expansion of ribs.

Answer: C

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24. Accoding to Boyle's law, the product of pressure and volume is a constant. Hence,

A. If volume of lungs is increased, then pressure decreases proportionately

B. if volume of lungs is increased, then pressure also increases proportionately

C. if volume of lungs is increased, then pressure decreases disproportionately

D. if volume of lungs is increased, then pressure remains the same.

Answer: A

Watch Video Solution

25. Which of the following statements about the mechanism of ventilation/breathing is incorrect ?

A. As the diaphragm relaxes, air is expelled from the respiratory system.

B. During inspration the lungs act as suction pump.

C. Inspiration is a passive and expiration is an active process.

D. For quiet breathing, external intercostal muscles and diaphragm play an important role.

Answer: C

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26. A person breathing normally at rest, takes in and expels approximately half a litre of air during each respiratory cucle. This is called

A. inspiratory reserve volume

B. tidal volume

C. expiratory reserve volume

D. vital capacity.

Answer: B

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27. Which one of the following statements is incorrect ?

A. The principal of countercurrent flow facilitates efficient respiration in gills of fishes.

B. The residual air in lungs slightly decreases the efficiency of repiration in mammals.

C. The presence of non-respiratory air sacs, increases the efficiency of respiration in birds.

D. in insects, circulating body fluids serve to distribute oxygen to tissues.

Answer: B

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28. Listed below are four respiratory capacities (i-iv) and four jumpled respiratiory volumes of a normal human adult.

	Respiratory volumes and capacities	Volume of air
(i)	Residual volume	1200 mL
(ii)	Vital capacity	4500 mL
(iii)	Inspiratory reserve volume	2500 mL
(iv)	Inspiratory capacity	3500 mL

A. $(ii)2500mL$, $(iii)4500mL$

B. $(iii)1200mL$, $(iv)2500mL$

C. $(iv)3500mL$, $(i)1200mL$

D. $(i)4500mL$, $(ii)3500mL$

Answer: C

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29. Complete the following sentences by selecting the correct option.

(A) Inspiratory capacity $(IC) =$ ____(i)____ $+ IRV$

(B) $\_\_\_(ii)\_\_\_ = TV + IRV + ERV$

(C) Funcational residual capacity $(FRC) = ERV + \_\_\_(iii)\_\_\_$

A.

(i)	(ii)	(iii)
Vital capacity	Tidal Volume	Residual volume

B.

(i)	(ii)	(iii)
Expiratory capacity	Residual volume	Inspiratory reserve volume

C.

(i)	(ii)	(iii)
Tidal volume	Vital capacity	Residual volume

D.

(i)	(ii)	(iii)
Tidal volume	Total lung capacity	Expiraoty capacity

Answer: C

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30. Consider the following statements each with one or two blanks.

(i) Left lung has $\_\_\_(1)\_\_\_$ lobes and right lung has $\_\_\_(2)\_\_\_$ lobes.

(ii) Prawn respires with $\_\_\_(3)\_\_\_$ and insects with $\_\_\_(4)\_\_\_$.

(iiii) Amount of air inhaled and exhaled with maximum effort is referred to as the $\_\_\_(5)\_\_\_$ of the lungs.

Fills up the above blanks by selecting the correct option.

A. (1) - three, (2) - two, (3) - gills (4) - tracheae

B. (1) - two, (2) - three, (5) -vital capacity

C. (3) -gills, (4) - tracheae, (5) - tidal volume

D. (3) - tracheae, (4) - gill, (5) tidal volume

Answer: B

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31. Consider the following statements each with two blanks.

(i) Actually, only about $\_\_(1)\_\_$ mL of air enters the lungs alveoli for the exchange of gases. The remaining fills the respiratory passage and is termed $\_\_(2)\_\_$.

(ii) The amount of air which one can inhale with maximum effort and also exhale with maximum effort is termed as $\_\_(3)\_\_$. It is about $\_\_(4)\_\_$ in normal adult person.

(iii) During normal quiet breathing, on an average, approximately $\_\_(5)\_\_$ mL of air is inspired or expired by adult human male in each breath. It is

termed as $\_\_(6)\_\_$ volume.

Which of the following options gives the correct fill ups for the respective blanks numbers from (1) to (6) in the above statement ?

A. (3)-vital capacity, $(4) - 4000$ mL, $(5) - 500$, $(6) -$ tidal

B. $(1) - 100$, (2)-residual volume, $(3) -$ functional residual capacity, $(4) - 3000mL$

C. $(1) - 350$, (2)-dead space air, $(5) - 1000$, (6)-inspiratory reserve

D. $(1) - 350$, (2)-residual volume, $(3) -$ vital capacity $(4) - 4000mL$

Answer: A

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32. The inspiratory reserve volume $+$ tidal volume $+$ expiratory reserve volume is the same as

A. inspiratory capacity $+$ expiratory reserve volume

B. total lung capacity $-$ funcational residual capacity

C. inspiratory capacity + functional residual capacity

D. inspiratory capacity + residual volume.

Answer: A

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33. Vital capacity of lungs is

A. $IRV + ERV$

B. $IRV + ERV + TV - RV$

C. $IRV + ERV + Tv + RV$

D. $IRV + ERV + TV.$

Answer: D

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34. After forceful inspiration, the amount of air that can be breathed out by maximum forced expiration is equal to

A. Inspiratory Reserve volume (IRV) + Expiratory Reserve Volume (ERV) + Tidal Volume (TV) + Residual Volume (RV)

B. IRV + RV + ERV

C. IRV + TV + ERV

D. TV + RV + ERV.

Answer: C

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35. Match column I with column II and select the correct option from the given codes.

	Column I		Column II
$A.$	Tidal volume	(i)	$2500-3000mL$of air
$B.$	Inspiratory reserve volume	(ii)	$1000mL$of air
$C.$	Expiratory reserve volume	(iii)	$500mL$of air
$D.$	Residual volume	(iv)	$3400-4800mL$of air
$E.$	Vital capacity	(v)	$1200mL$of air

A. A-(iii), B-(iv), C-(ii), D-(i), E-(v)

B. A-(iii), B-(i), C-(ii), D-(v), E-(iv)

C. A-(iii), B-(i), C-(iv), D-(iv), E-(ii)

D. A-(v), B-(i), C-(ii), D-(iii), E-(iv)

Answer: B

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36. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
$A.$	TV + ERV	(i)	$\exp ira \to ry \cap acity$
$B.$	RV + ERV + TV + IRV	(ii)	Total Lung Capacity
$C.$	ERV + RV	(iii)	Functional Residual Capacity

A. $A-(i), B-(ii), C-(iii)$

B. $A-(iii), B-(i), C-(ii)$

C. $A-(iii), B-(ii), C-(i)$

D. $A-(ii), B-(iii), C-(i)$

Answer: A

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37. 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 respires through parapodia.

A.

(i)	(ii)	(iii)	(iv)
T	F	T	F

B. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & F & T & F\end{matrix}$

C. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & T & F & T\end{matrix}$

D. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ T & T & F & F\end{matrix}$

Answer: D

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38. The exchange of gases in the alveoli of the lungs takes place by

A. passive transport

B. active transport

C. osmosis

D. simple diffusion.

Answer: D

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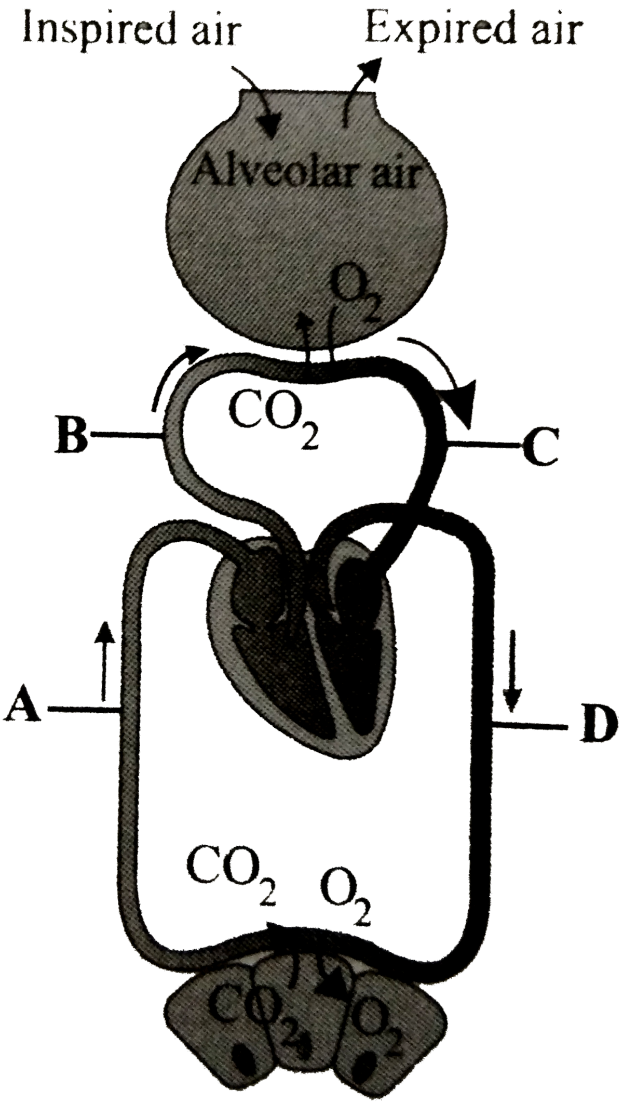
39. The given figure shows the diagrammatic represtation of exchange of gases at the alveolus and the body tissues with blood and trasport of oxygen and carbon dioxide. Identify the blood vessles A to D.



A.

A	B	C	D
Systemic vein	Pulmonary artery	Pulmonary vein	Systemic artery

B.

A	B	C	D
Systemic artery	Pulmonary artery	Pulmonary vein	Systemic vein

C.

A	B	C	D
Pulmonary artery	Systemic vein	Pulmonary vein	Systemic vein

D.

A	B	C	D
Systemic vein	Pulmonary vein	Pulmonary artery	Systemic artery

Answer: A

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40. Consider the following statement each with two blanks.

(i) Diaphragm contrects to help in __(1)__ while the contraction of abdominal muscles help in __(2)__.

(ii) Vital capacity of trained atheles is __(3)__ than that of non-athletes

while the vital capacity of non-smokers is $\underline{\quad(4)\quad}$ than that of smokers.

Which of the follwoing options gives the correct fill ups for the respective blanks numbered from (1) to (6) in the above statements ?

A. (1)-expiration, (2)-inspiration, (5)-higher, (6)-lower

B. (3)-higher, (4)-lower, 5-lower (6)-higher

C. (1)-inspiration, (2)-forced expiration, (3)-higher, (4)-higher

D. (1)-expiration, (2)-forced expiration, (5)-higher, (6)-lower

Answer: C

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41. Which of the following would have the same O_2 content?

A. Blood entering the lungs and blood leaving the lungs

B. Blood entering the right side of the heart and blood leaving the right side of the heart

C. Blood entering the right side of the heart and blood leaving the left side of the heart

D. Blood entering the tissue capillaries and blood leaving the tissue capillaries

Answer: B

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42. What is the approximate normal composition of alveolar air ?

A. 14% oxygen, 6% carbon dioxide, 80% nitrogen

B. 21% oxygen, 2% carbon dioxide, 77% nitrogen

C. 16% oxygen, 3% carbon dioxide, 81% nitrogen

D. 10% oxygen, 8% carbon dioxide, 82% nitrogen

Answer: A

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43. The CO_2 content by volume, in the atmospheric air is about

A. $3.34\ \%$

B. $4\ \%$

C. $0.0314\ \%$

D. $2.1\ \%$

Answer: C

Watch Video Solution

44. Among the following the partial pressure of oxygen is maximum in

A. alveolar air

B. aterial blood

C. venous blood

D. expired air.

Answer: D

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45. In lungs, the air is separated from the venous blood through

A. transitional epithelium + tunica externa of blood vessel

B. squamous epithelium + endothelium of blood vessel

C. squamous epithelium + tunica media of blood vessel

D. none of these

Answer: B

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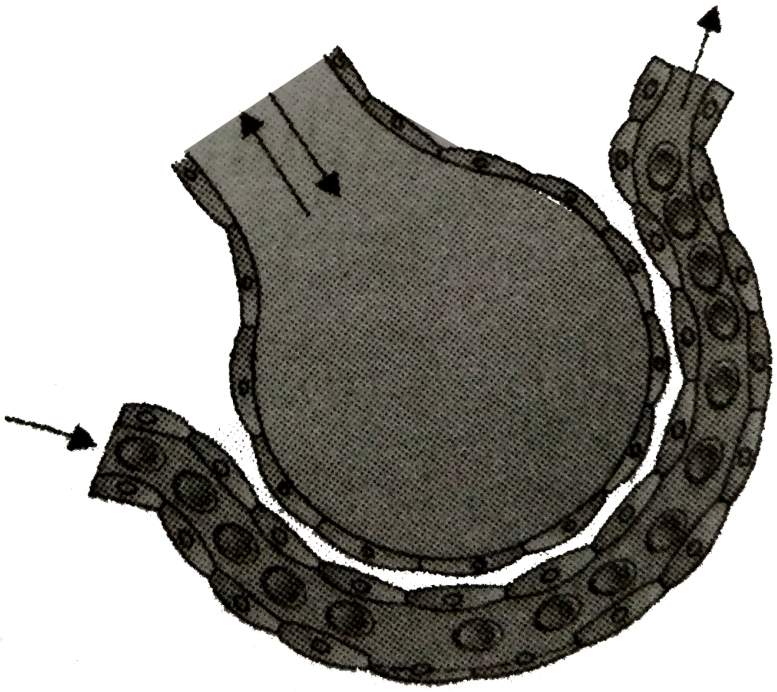
46. The factor which does not affect the rate of alveolar diffusion is



A. solubility of gases

B. thickness of the membranes

C. pressure gradient

D. reactivity of the gases.

Answer: D

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47. Besides RBC, blood plasma also carries O_2 in solution. The percentage is

A. $3 - 9\%$

B. $1 - 2\%$

C. $3 - 6\%$

D. $2 - 3\%$

Answer: D

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48. Which of the following statement is correct?

A. The contraction of internal intercostal muscles lifts up the ribs and sternum.

B. The RBCs transport oxygen only.

C. The thoracic cavity is anatomically an air tight chamber.

D. Healthy men cap inspire appromixmately 500 mL of air per minute.

Answer: C

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49. Which of the following statement is true about RBCs in humans?

A. They carry about $20 - 25$ percent of CO_2.

B. They transport 99.5 percent of O_2

C. They transpart about 80 per cent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma.

D. They do not carry CO_2 at all.

Answer: A

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50. The carbon dioxide is transported via blood to lungs mostly

A. in combination with haemoglobin only

B. dissolved in blood plasma

C. in the form of bicarbontes

D. as carbaminohaemoglobin.

Answer: C

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51. Blood carries the CO_2 in three forms. The correct percentages of CO_2 in the these form are

A.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$20-25\,\%$	$70\,\%$	$7\,\%$

B.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$70\,\%$	$20-25\,\%$	$7\,\%$

C.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$20-25\,\%$	$7\,\%$	$70\,\%$

D.

As carbamino-haemoglobin in RBC	As bicarbonates	Dissolved for
$7\,\%$	$20-25\,\%$	$70\,\%$

Answer: A

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52. Bulk of oxygen diffuses from the plasma into the red blood corpuscles where it joins loosly with Fe^{2+} ions of hemoglobin (Hb) to form bright red oxyhaemoglobin (HbO_2). The process is called

A. oxidation

B. oxgenation

C. hydration

D. dehydrogenation

Answer: B

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53. One haemoglobin carries how many molecules of O_2 ?

A. 4

B. 2

C. 6

D. 8

Answer: A

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54. The oxygen dissociation curve is

A. parabola

B. slope

C. sigmoid

D. stright line.

Answer: C

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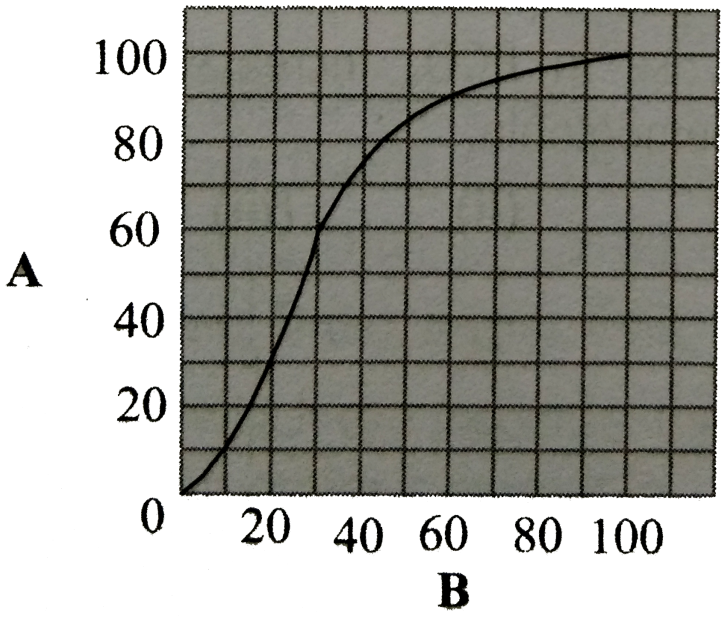
55. Which of the following is incorrect about the given graph ?



A. The curve is called oxygen dissociation curve.

B. The part 'A' represents percentage saturation of haemologbin with oxygen.

C. The part 'B' represents partial pressure of carbon dioxide.

D. This curve is highly useful in studying the effect of factors like PCO_2, H^+ concentration, etc. on binding of CO_2 with haemoglobin.

Answer: C

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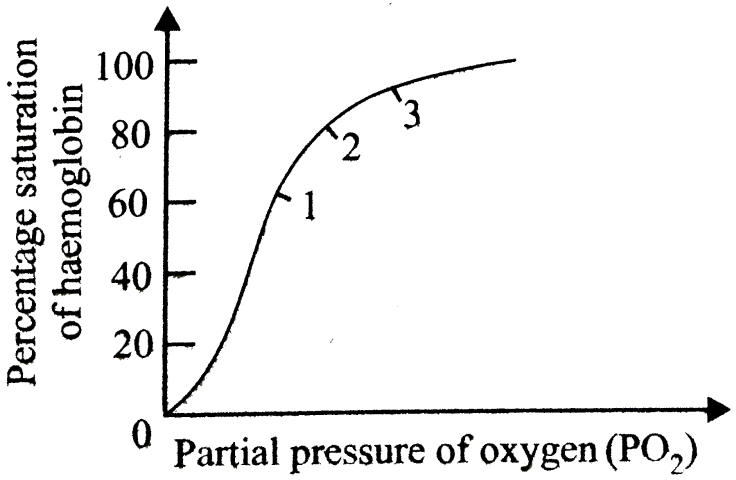
56. The given graph shows an oxygen dissociation curve for haemoglobin.



Wher is the body will haemoglobin be saturated at the percentage shown at point 1, 2 and 3 in graph ?

A. Left ventricle 1 Pulmonary vein 2 Vena cava 3

B. Left ventricle 2 Pulmonary vein 1 Vena cava 3

C. Left ventricle 2 Pulmonary vein 3 Vena cava 1

D. Left ventricle 3 Pulmonary vein 2 Vena cava 1

Answer: C

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57. When temperature decrease, oxy-Hb curve becomes

A. more steep

B. straight

C. parabola

D. none of these

Answer: A

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58. Which of the following factors is not favourable for the formation of oxyhaemoglobin ?

A. High PO_2

B. Low temperature

C. Less H^+ concentration

D. High PCO_2

Answer: D

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59. Consider for following four statements and select the correct option starting which ones are true (T) and which ones are flase (F).

(i) Expiration is normally brough about by the relaxation of inspiratory muscles.

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

(iii) A person can expel all the air from the lungs by a forceful expiration.

(iv) A rise in PCO_2 increases the oxygen-affinity of haemoglobin.

A. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & F & T & F\end{matrix}$

B. $\begin{matrix}(\mathrm{i})1 & (ii) & (iii) & (iv) \\ T & T & F & F\end{matrix}$

C. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ F & T & T & F\end{matrix}$

D. $\begin{matrix}(\mathrm{i}) & (ii) & (iii) & (iv) \\ T & T & T & F\end{matrix}$

Answer: B

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60. 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

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61. A large proportion of oxygen remain unused in the human blood even after its uptake by the body tissues. This O_2

A. acts as a reserve during muscular exercise

B. raises the PCO_2 of blood to $75mm$ of Hg

C. is enough to keeo oxyhaemoglobin saturation at $96\ \%$

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

Answer: A

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62. In the tissues, high concentrations of carbon dioxide

A. increases the affinity of haemoglobin to both oxygen and hydrogen

B. increases the affinity of haemoglobin to oxygen but decreases its affinity to hydrogen

C. decrease the affnitiy to haemoglobin to oxygen but increases its affinity to hydrogen

D. decrease the affinity of haemoglobin to both oxygen and hydrogen.

Answer: C

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63. Fetal haemoglobin has X affinity for oxygen than that of mother's haemoglobin during gestation. X is

A. same

B. higher

C. lower

D. lower affinity earlier but higher later.

Answer: B

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64. 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. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: B

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65. Match column I with column II and select the correct option from the codes given below.

	Column I		Column II
$A.$	Tracheoles	(i)	Yeast
$B.$	Carbonic anhydrase	(ii)	Fish
$C.$	Lactic acid	(iii)	Inspiration
$D.$	Fermentation	(iv)	Vital capacity
$E.$	Gill filaments	(v)	Fast muscle
$F.$	Cutaneous respiration	(vi)	Insert
$G.$	Diaphragm	(vii)	Bicarbonates
		$(viii)$	Earthworm

A.

$A-(vi), B-(vii), C-(v), D-(i), E-(ii), F-(vii), G-(iii)$

B.

$A-(viii), B-(iv), C-(vii), D-(i), E-(iii), F-(ii), G-(v$

C.

$A-(vi), B-(i), C-(ii), D-(v), E-(iv), F-(viii), G-(iii)$

D.

$A-(viii), B-(vii), C-(i), D-(iv), E-(ii), F-(vi), G-(v)$

Answer: A

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66. The enzyme that increases the reaction rate between CO_2 and H_2O in red blood cell is

A. carbonic anhydrase

B. adenylate cyclase

C. carbonic synthetase

D. alkaline phosphatase.

Answer: A

Watch Video Solution

67. Which of the following equations is correct ?

A. $CO_2 \rightarrow H_2CO_3 \rightarrow HCO_3^- + H^+$

B. $CO_2 + H_2O \underset{\text{anhydrase}}{\overset{\text{Carbonic}}{\Longleftrightarrow}} H_2C_3 \underset{\text{anhydrase}}{\overset{\text{Carbone}}{\Longleftrightarrow}} H^+ + HCO_3^-$

C. $CO_2 + H_2O \Rightarrow CH_4 + 2O_2$

D. $CO_2 + H_2O \Leftrightarrow CO + H_2O_2$

Answer: B

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68. People living at sea level have around 5 million RBC per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude.

A. people eat more nutritive food, therefore more RBCs are formed

B. people get pollution-free air to breathe and more oxygen is available

C. atmospheric O_2 level is less and hence more $RBCs$ are needed to abosorb the required amount of O_2 to survive

D. there is more UV radiation which enhances RBC production.

Answer: C

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69. During CO_2 transport, HCO_3^- diffuses from erythrocytes to plasma and in turn upsets the ionic balance momentraily. In order to keep the ionic balance, an equal number of Cl^- pass into the erythrocyes from plasma. The process is known as

A. Hamburger phenomenon

B. bicarbonate shift

C. carbonation

D. Bohr's effect.

Answer: A

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70. 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 by blood.

D. Only carbon dioxide is transported by blood.

Answer: B

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71. Which of the following is ture for CO_2 concentration ?

A. More in alveolar air than in expired air

B. More in expired air than in alveolar air

C. More in inspired air than in alveolar air

D. More in inspired air than in expired air

Answer: A

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72. 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

Answer: D

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73. Although much CO_2 is carried in blood, yet blood does not become acidic, because

A. CO_2 is absorbed by the leucocytes

B. Oxygen combines with haemoglobin to form oxyhaemoglobin

C. CO_2 transport and blood buffers play an important role in it

D. it is continously diffused through the tissues and is not allowes to accumulate.

Answer: C

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74. Haldane effect plays more important role in promoting carbon dioxide tranport than that of the Bhr's effect in promoting oxygen trasnport because

A. oxyhaemoglobin is a stronger acid which donates hydrogen ion $\left(H^+\right)$ which in turn displace carbone dioxide from blood

B. carbaminohaemoglobin is a stronger acid which spilts into hydrogen ion $\left(H^+\right)$ and bicarbonate $\left(HCO_3^-\right)$

C. carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue

D. carbon dioxide is less soluble in venous blood than in arterial blood.

Answer: A

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75. During rest, the metabolic needs of the body are at their minimum. Which of the following Is indicative of this situation ?

A. Rate of breathing

B. O_2 intake CO_2 output

C. Pulse rate

D. All of these

Answer: D

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76. Match column I with column II and select the correct option from the given codes ?

	Column I		Column II
$A.$	Trachea	(i)	PO_2in alveolar air
$B.$	Respiratory centre	(ii)	ATP
C	Yeast	(iii)	Cartilaginous rings
$D.$	Insects	(iv)	MEdulla oblongata
$E.$	Fish	(v)	Larynx
$F.$	Biologically useful energy	(vi)	Tracheal respiration
$G.$	100mm Hg	(vii)	Ethanol
$H.$	Vocal cords	(vii)	Branchial respiration

A.

$A-(iii), B-(iv), C-(vii), D-(vi), E-(vii), F-(ii), G-(i$

B.

$A-(v), B-(ii), C-(vii), D-(viii), E-(vi), F-(iv), G-(i)$

C.

$A-(vi). B-(iv), C-(viii), D-(v), E-(i), F-(ii), G-(iii)$

D.

$$A-(i), B-(v), C-(vii), D-(iii), E-(viii), F-(ii), G-(iv$$

Answer: A

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77. Pneumotaxic center which can moderate the functions of the respiratory rhythm center is present in

A. pons region of brain

B. thalamus

C. spinal cord

D. right cerebral hemisphere.

Answer: A

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78. Match column I with column II an select the correct option from the codes given below.

Column I	Column II
A. Carbomino-heamoglobin	(i) Inspiration
B. Diaphragm	(ii) Hamburger's phenomenon
C. Larynx	(iii) Diffusion of Cl^- into RBC
D. Pons varolii	(iv) Carbon dioxide
E. Chloride shift	(v) Cartilages
	(vi) Pneumotaxic centre
	(vii) Expiration

A. $A-(iv), B-(i), (vii), C-(v), D-(vi), E-(ii), (iii)$

B. $A-(v), B-(i), C-(iv), (vii), D-(vi), E-(ii), (iii)$

C. $A-(ii), (vi), B-(i), C-(iii), D-(v), (vii), E-(iv)$

D. $A-(iii), B-(i), C-(ii), (v), D-(vi), (vii), E-(iv)$

Answer: A

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79. Chemosensitive area of respiratory centre in medulla is affected by

A. less CO_2 and H^+ ions

B. less O_2 and H^+ ions

C. excess CO_2 and H^+ ions

D. excess O_2 and H^+ ions

Answer: C

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80. Fill up the blanks in the following paragraph by selecting the correct option.

Human beings have a significant ability to maintain and moderate the respiratory rhythm to suti the demands of the body tissues. This is done by the neural system. A specialised centre present in the medulla region of the brain called ___(i)___ is primarily responsible for this regulation. Another centre present in the pons region of the brain called ___(ii)___ can moderate the functions of the repiratory rhytm cenre. Neutral signal from this cenre cen reduce the duration of ___(iii)___ and thereby alter the

respiratory rate. A ___(iv)___ is situated adjacent to the rhythm centre which is highly sensitive to CO_2 and hydrogen ions.

A.

(i)	(ii)	(iii)	(iv)
Chemosensitive area	Respiratory rhythm centre	Expiration	Pneu

B.

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Pneumotaxic centre	Inspiration	Cher

C.

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Chemosensitive area	Expiration	Pneu

D.

(i)	(ii)	(iii)	(iv)
Pneumotaxic centre	Chemosensitive area	Inspiration	Respirator

Answer: B

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81. Rate of breathing is controlled mainly by

A. CO_2 is level in blood

B. pH in blood

C. O_2 level in blood

D. O_2 level and pH in blood.

Answer: A

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82. The respiratory centre in the brain is stimulate by

A. CO_2 concentration in venous blood

B. O_2 concentration in arterial blood

C. CO_2 concentration in arterial blood

D. O_2 concentration in venous blood

Answer: C

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83. Complete the following sentence by selecting the correct option.

Receptors associtated with aortic arch and carotid artery can recognise changes in $\_\_(i)\_\_$ and $\_\_(ii)\_\_$ concentration and send necessary signals to $\_\_(iii)\_\_$ for remedial actions.

A. (i) (ii) (iii)
O_2 CO_2 pneumotaxic centre

B. (i) (ii) (iii)
CO_2 H^+ rhythm centre

C. (i) (ii) (iii)
CO_2 H^+ apneustic centre

D. (i) (ii) (iii)
O_2 H^+ pneumotaxic centre

Answer: B

Watch Video Solution

84. Complete the following sentence by selecting the correct option.

the breathing rhythm is generated in the $\_\_(i)\_\_$ and is influenced by variation in levels of $\_\_(ii)\_\_$ in the blood.

A. (i) (ii)
medulla CO_2

B. (i) (ii)
medulla O_2

C. (i) (ii)
frontal lobe CO_2 and O_2

D. (i) (ii)
frontal lobe CO_2

Answer: A

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85. When CO_2 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: D

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86. Statement I : Rate of breathing 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. Both statement 1 and 2 correct.

B. Statement 1 is correct but statement 2 is incorrect.

C. Statement 1 is incorrect but statement 2 is correct.

D. Both statement 1 and 2 incorrect.

Answer: A

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87. Read the following four statement (i) - (iv) with certain mistakes in two of them.

(i) A water breather expends much more energy in ventilating its

respiratoru surface than an air-breathing one.

(ii) Lungs become empty after forceful expiration.

(iii) Exchange of gases in the lungs are interrupted during expiration.

Respiratory movement are controlled by CO_2 concentration of arterial blood.

Which of the above two statements have mistakes ?

A. (i) and (iv)

B. (ii) and (iii)

C. (i) and (ii)

D. (iii) and (iv)

Answer: B

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88. Human beings have a significant ability to maintain and moderate the respiratory rhythm to suit demands of the body. For it we have

Respiratory rhythm centre in medulla -R

Pneumotaxic centre in pons -RT

Chemosensitive area in medulla -C_1

Peripheral chemoreceptors in aortic arch and carotid artery -C_2

Find out the correct path for regulation of respiration.

A. $C_2 \rightarrow R \rightarrow PT \rightarrow C_1$

B. $PT \rightarrow \underset{\uparrow}{R} \leftarrow C_2$
C_1

C. $C_1 \rightarrow \underset{\uparrow}{PT} \rightarrow C_2$
R

D. $PT \rightarrow \underset{\uparrow}{C_2} \rightarrow C_1$
R

Answer: B

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89. The urge to inhale in humans results from

A. rising PCO_2

B. rising PO_2

C. falling PCO_2

D. falling PO_2

Answer: A

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90. Read the following four statement carefully.

(i) Ventral respiratory group of neurons of medulla oblongata can cause both inspiration and expiration.

(ii) The part of the respiratory system starting with the external nostrils up to the terminal bronchioles constitutes the respiratory or exchange part of the respiratory system.

(iii) During swallowing epiglottis can be covered by a thin elastic cartilaginous flap called glottis to prevent the entry of food into the larynx.

(iv) Binding of oxygen with haemoglobin in primarily related of oxygen with haemoglobin is primarily related to partial prssure of O_2.

Which of the above two statement are correct ?

A. (ii) and (iii)

B. (iii) and (iv)

C. (i) and (ii)

D. (i) and (iv)

Answer: D

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91. Emphysema is a condition resulting from

A. cigarette smoking

B. liquor consumption

C. durg addiction

D. reduced oxygen carrying capacity of blood.

Answer: A

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92. Which one of the following is the incorrect 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 respiratory rate.

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

D. None of these

Answer: D

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93. Given below are few respiratory disorders. Identify occupational respiratory disorders among these.

(i) Coryza , (ii) SARS

(iii) Silicosis , (iv) Asbestosis

(v) Emphysema

A. (i) and `(ii)

B. (i) and (v)

C. (iii) and (iv)

D. (i), (ii) and (v)

Answer: C

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94. Which of the following statements is correct ?

A. During inspiration external intercostal muscles and diaphragm contract.

B. Cyanosis mean collapse of alveoli.

C. Eupnea is slow breathing.

D. Coryza is caused by human coronavirus.

Answer: A

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95. Following are few characters of a disorder from the choices give below.

A. Diphtheria

B. Rhinitis

C. Bronchial carcinom

D. Emphysema

Answer: B

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96. Visiting high mountains may cause altitude sickness in men living in plan areas. Prime of this is

A. excess of CO_2 in blood

B. decreased efficiency of haemoglobin

C. decreased partial pressure of oxygen

D. decreased efficiency of red blood cells.

Answer: C

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97. Carbon monoxide can kill a person because of it's extermely high affinity for

A. haemoglobin

B. phytochrome

C. cytochrome

D. none of these

Answer: A

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98. The toxic effect of carbon monoxide is due to its greater affinity for haemoglobin as compared to oxygen approximately by

A. 200 times

B. 1000 times

C. 2 times

D. 20 times

Answer: A

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99. Blood analysis of a patient reveals an ususually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct ?

A. carbon disulphide

B. chloroform

C. carbon dioxide reacts with water to form carbonic acid that lowers the pH in tissue

D. carbon monoxide.

Answer: D

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100. During winter a person died during sleep, the room was closed and a container with burnt charcoal was found in the room. What may be the possible reason of his death ?

A. Non-availability of oxygen

B. Hb has more affinity to combine with carbon monoxide

C. Hb has more affinity to combine with carbon dioxide

D. Combined effect of both (a) and (c)

Answer: B

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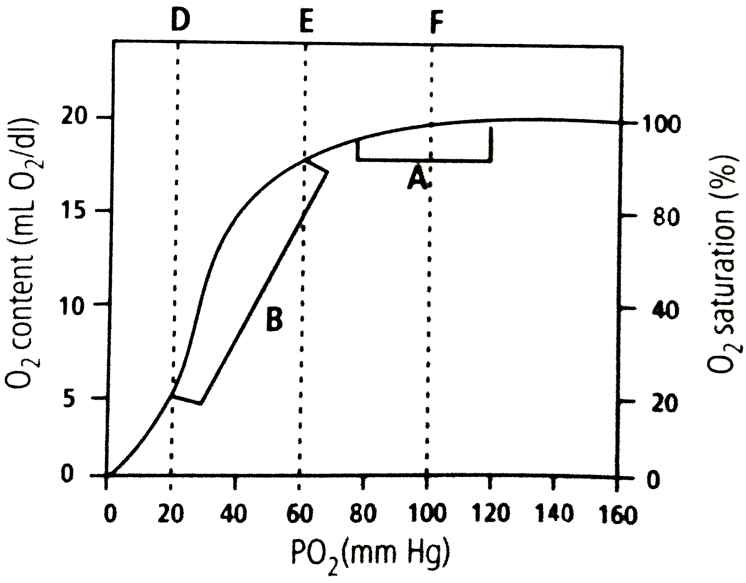

101.

Blood can combine with almost _____ of oxygen if the haemoglobin

is 100 per cent saturated.

A. 18 mL

B. 15 mL

C. 20 mL

D. 10 mL

Answer: C

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102.

Which of these is incorrect regarding A and B in the given graph ?

A. A is deoxygenated blood leaving the tissues.

B. B is reduced blood returning from tissues.

C. A is oxygenated blood leaving the lungs.

D. B is deoxygenated blood in the systemic veins.

Answer: A

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103. 

Which of these is correct regarding D, E and F areas in the graph ?

A. D shows venous blood in exercise.

B. E shows normal venous blood

C. F shows normal arterial blood.

D. All of these

Answer: B

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104. 

How much oxygen will be released to the tissues by blood on passing

from lungs to tissues ?

A. 15 mL of O_2 / 100 mL of blood

B. 70 mL of O_2 / 100 mL of blood

C. 5 mL of O_2 / 100 mL of blood

D. 20 mL of O_2 / 100 mL of blood

Answer: C

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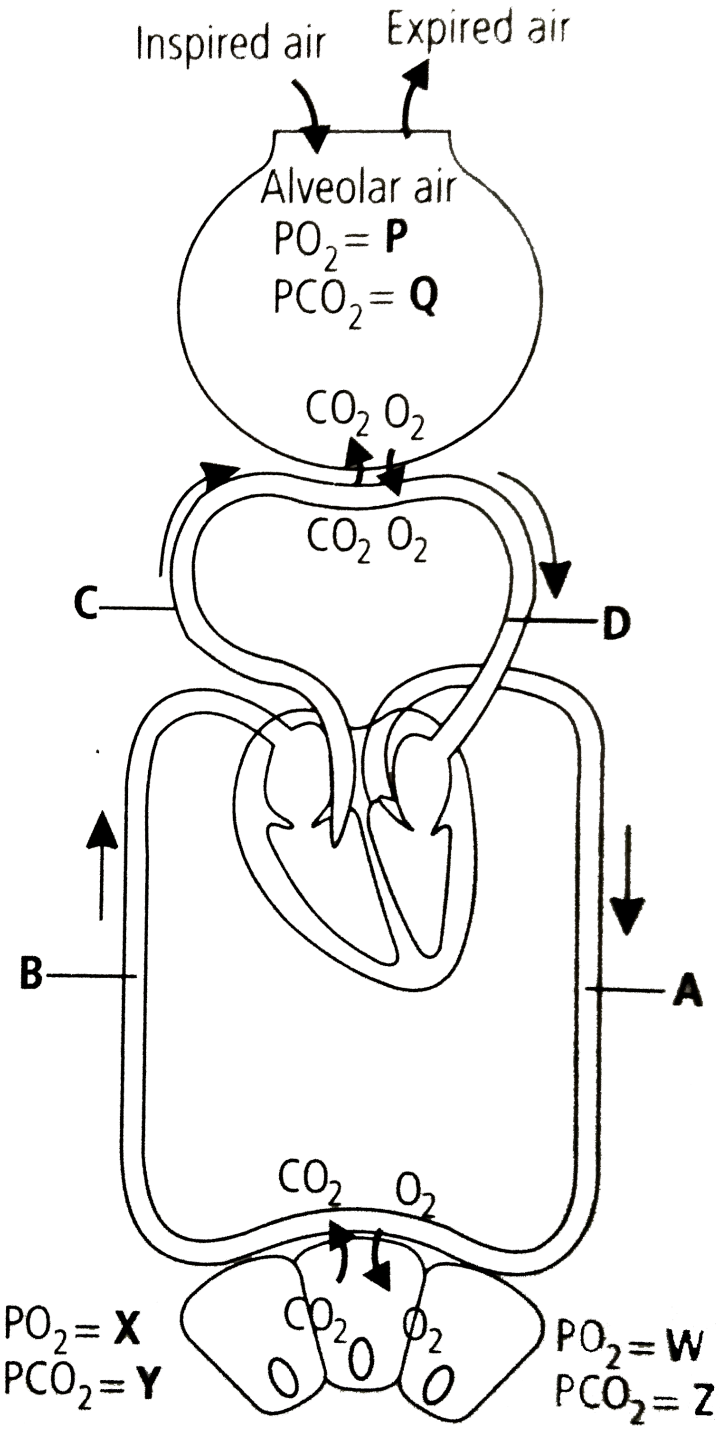

105.

During strenuous exercise, the muscle interstitial fluid pO_2 falls to 20

During strenuous exercise, the muscle interstitial fluid pO_2 falls to 20 mm Hg. The oxygen delivered by blood that passes through the exercising muscle tissus will be

A. five times as much as normal

B. double to the normal

C. three times as much as normal

D. none of these.

Answer: C

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106.

What is the labelled blood vessels A, B, C or D carries oxygenated blood ?

A. A and B

B. B and C

C. A and D

D. B and D

Answer: C

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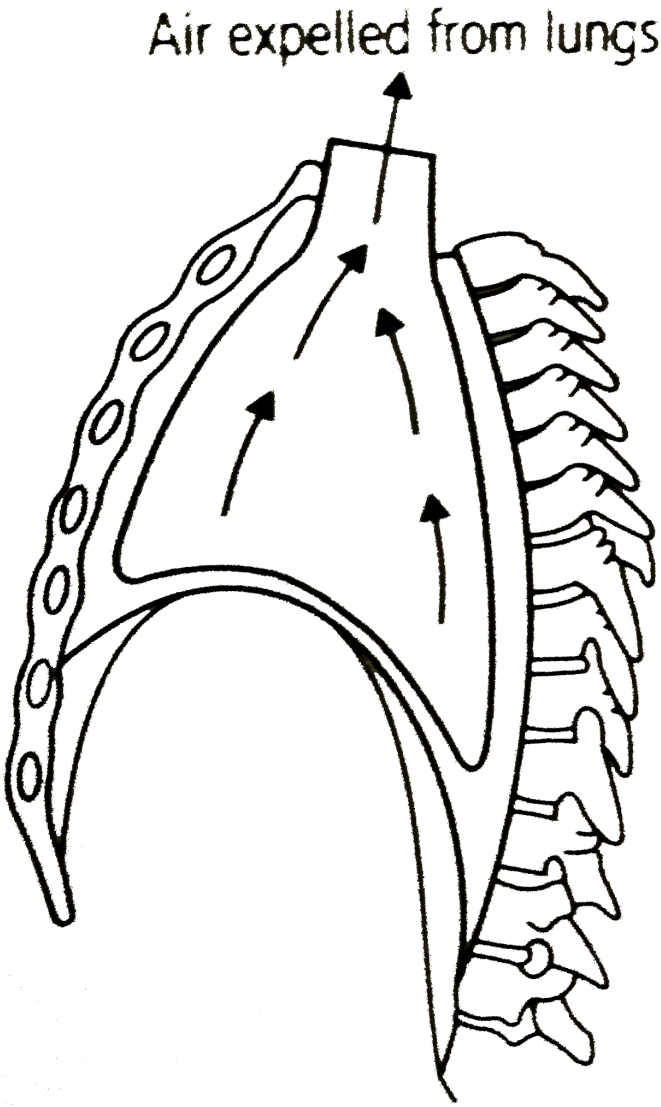

107.

What is the value of W, X, Y and Z normally (in mmHg) ?

A. a)

W	X	Y	Z
95	40	45	40

B. b)

W	X	Y	Z
95	40	40	45

C. c)

W	X	Y	Z
40	45	95	40

D. d)

W	X	Y	Z
95	45	40	40

Answer: A

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108.

Which of these is incorrect regarding the given mechanism of breathing ?

A. Volume of thorax decreases

B. Ribs and sternum are raised

C. Diaphragm relaxes and arches upwards

D. All of these

Answer: B

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109.

In the given mechanism, diaphragm, sternum and intercostal muscles work work together to _____ the thoracic volume and thereby pulmonary volume. This lead to _____ in intra-pulmonary pressure to slightly _____ the atmospheric pressure, causing expiration.

Select the correct sequnence of words to complete the above paragraph ?

A. decrease, decrease, below

B. increase, decrease, above

C. decrease, increase, above

D. increase, increase, below

Answer: C

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110. If $P_{atm} = 0mmHg$ and $P_{alv} = -2$ mm Hg, then

A. It is the end of the normal inspiration and there is no airflow

B. it is the end of the normal expiration and there is no airflow

C. transpulmonary pressure (P_{tp}) is -2 mm Hg

D. air is flowing into the lungs.

Answer: D

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111. If alveolar ventilation is $4200mL/\ \min$, respiratory frequency is 12 breaths per minute, and tidal volume is 500 mL, what is the anatomical-dead-space ventialtion ?

A. $1800\text{mL}/\min$

B. $6000\text{mL}/\min$

C. $350\text{mL}/\min$

D. $1200 \mathrm{mL} / \mathrm{min}$

Answer: A

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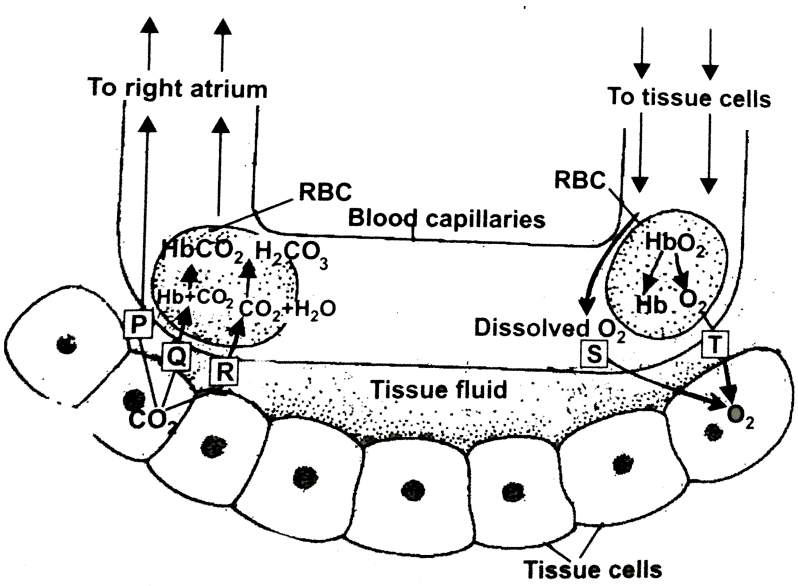
112. Refer to the given diagrammatic representation of the transportation of oxygen and carbon dioxide in the blood. P, Q, R, S and T represent percentage of both gases in different forms. Select the correct option for $P - T$.



A.

P	Q	R	S	T
23 %	70 %	7 %	93 %	7 %

B.

P	Q	R	S	T
7%	23%	70%	3%	97%

C.

P	Q	R	S	T
7%	23%	70%	97%	3%

D.

P	Q	R	S	T
70%	7%	23%	97%	3%

Answer: B

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113. Respiration in insects Is called direct because

A. the cells 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 the air outside thorugh body surface

D. tracheal tubes exchange O_2 / CO_2 directly with the haemocoel which then exchange with tissues.

Answer: A

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114. A person surffers punctures in his chest cavity in an accident, without any damage t 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

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115. 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. it increases CO_2 transport

D. it increases O_2 transport.

Answer: B

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116. 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 proces whereas expiration is passive.

C. Inspiration and expiration are active processes.

D. Inspiration and expiration are passive processes.

Answer: B

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117. 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:

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118. Mark the correct pair of muscles involved in the normal breathing in humans.

A. External and internal intercostal mucles

B. Diaphragm and abdominal muscles

C. Diaphragm and external intercostal muscles

D. Diaphragm and intercostal muscles

Answer: D

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

A. the bronchioles are found damaged

B. the alveolar walls are found damaged

C. the plasma membrane is found damaged

D. the respiratory muscles are found damaged.

Answer: B

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120. Respiratory process is regulated by certain specialised 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

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121. CO_2 dissociates 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

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122. In breathing movements, air volume can be estimated by

A. stethoscope

B. hygrometer

C. sphygmomanometer

D. spirometer.

Answer: D

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123. 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

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124. 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^+ concentrations

Answer: A

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125. Match the following and mark the correct options.

A. $A-(ii), B-(i), C-(iv), D-(iii)$

B. $A-(i), B-(iv), C-(ii), D-(ii)$

C. $A-(i), B-(iii), C-(ii), D-(iv)$

D. $A-(i), B-(ii), C-(iv), D-(iii)$

Answer:

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126. Assertion : Vocal cords consists of three pairs of mucous membrane that extend into the lumen of the larynx.

Reason : Sound is produced by only two pairs of cords.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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127. Assertion : Tracheae, primary, secondary and tertiary bronchi are supported by incomplete carilaginous rings.

Reason : These rings of carilage make the wall non-collapsible.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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128. Assertion : The lungs are situated in thoracic chamber which is anatomically an air-tighlt chamber.

Reason : Such an arrangement is essential to avoid an change in pulmonary volume.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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129. Assertion : The abdominal muscles are primarily involved in generating pressure gradient between the lungs and the atmosphere.

Reason : The strength of inspiration and expiration can be increased by abdiminal muscles in diaphragm and intercostal muscles.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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130. Assertion : If two men, expire the same volume of air after normal inspiration, they have the same expiratory capacity.

Reason : Expiratory capacity includes tidal volume and inspiratory reserve volume.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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131. Assertion : Alveoli are the primary sites for exchange of gases.

Reason : All factors in our body are favourable for diffusion of O_2 from alveoli to tissues and that of CO_2 from tissues to alveoli.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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132. Assertion : A sigmoid curve is obtained when percentage saturation of haemoglobin with O_2 is plotted against the PO_2.

Reason : Every 100 mL of oxygenated blood can deliver around $5mL$ of O_2 to the tissues under normal physiological conditions.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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133. Assertion : A rise in PCO_2, H^+ ions and temperature shifts the HbO_2 dissociation curve to right.

Reason : A rise in PCO_2 or fall in pH decreases oxygen affinity for haemoglobin.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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134. Assertion : At the tissue level, 70 percent of CO_2 formed from contabolism is trapped as bicarbonate in the RBCs.

Reason : At tissue level, carbonic anhydrase in RBCs facilites the formation of CO_2 and H_2O from bicarbonate.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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135. Assertion : Chloride shift is exchange of Cl^- of plasma and HCO_3^- of RBCs.

Reason Chloride shift, maintains an acid base balance between the RBC's and plasma.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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136. Assertion : The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

Reason : Increased PCO_2 and H^+ concentration inputs from chemoreceptors can activate respirotory rhytm centre to make necessary adjustments.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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137. Assertion : Pneumotaxic centre, located in the medulla region of the brain, moderates the respiratory rhythm centre.

Reason : Pneumotaxic centre controls the switch $'ON'$ point of inspiration.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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138. Assertion : Emphysema is the permanent abnormal inflation of air space of terminal bronchioles or alveolar sacs.

Reasons : Destruction of pulmonary tissues specially alveolar septa and flattening of alveolar ducts occur in emphysema.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B

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139. Asertiion : Inspirations occurs when there is a negative pressure in the lungs with respect to the atmospheric pressure.

Reason : During inspiration, a decrease in pulmonary volume increases the intre-pulmonary pressure than atmospheric pressure which forces the air from outside to moe into the lungs.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C

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140. Assertion : Asthma is a difficulty in breathing caushing wheezing.

Reason : Asthma occurs due to inflammation of bronchi and bronchioles.

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

B. If both assertion and reason are true and reason is not the correct explanation of assertion

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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