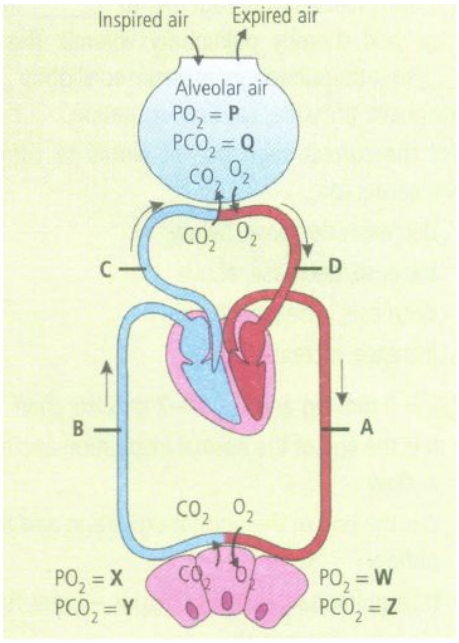
Time : 1 Mins **BREATHING AND EXCHANGE OF GASES 1** **Marks : 680**

1. Which of 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

2. Air is breathed through _____ .
   a) trachea - lungs - larynx - pharynx - alveoli
   b) nose - larynx - pharynx - bronchus - alveoli - bronchioles
   c) nostrils - pharynx - larynx - trachea - bronchi - bronchioles - alveoli d) nose - mouth - lungs

3. Rate of breathing is controlled mainly by:
   a) CO_2 level in blood b) pH in blood c) O_2 level in blood d) O_2 level and pH in blood.

4. 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

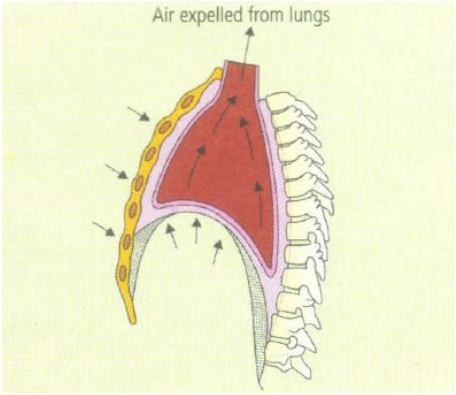
5. Match the following and mark the correct options.

Animal	**REspiratory Organ**
A. Earthworm	(i) Moist cuticle
B. Aquatic arthropods	(ii) Gills
C.Fishes	(iii) Lungs
D. Birds/Reptiles	(iv) Trachea

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

6. 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 absorb the required amount of O_2 to survive
   d) there is more UV radiation which enhances RBC production.
7. 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
8. **Assertion:** Tracheae, primary, secondary and tertiary bronchi are supported by incomplete cartilaginous rings.
   Reason: These rings of cartilage make the wall noncollapsible.
   a) If both assertion and reason are true and reason is the correct explanation of assertion.
   b) If both assertion and reason are true but 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
9. A person breathing normally at rest, takes in and expels approximately half a litre of air during each respiratory cycle. This is called
   a) inspiratory reserve volume b) tidal volume c) expiratory reserve volume d) vital capacity
10. Lungs are enclosed in
    a) perichondrium b) pericardium c) pleural membrane d) peritoneum.
11. In alveoli of the lungs, the air at the site of gas exchange, is separated from the blood by_____ .
    a) alveolar epithelium only b) alveolar epithelium and capillary endothelium
    c) alveolar epithelium, capillary endothelium and tunica adventitia
    d) alveolar epithelium, capillary endothelium, a thin layer of tunica media and tunica adventitia
12. 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.
13. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in_____
    a) Fallopian tubes and Pancreatic duct b) Eustachian tube and Salivary duct
    c) Bronchioles and Fallopian tubes d) Bile duct and Bronchioles
14. In the given mechanism, diaphragm, sternum and intercostal muscles work together to the thoracic volume and thereby pulmonary volume. This leads to _____ in intra-pulmonary pressure to slightly _____the atmospheric pressure, causing expiration. Select the correct sequence of

words to complete the above paragraph.



a) decrease, decrease, below b) increase, decrease, above c) decrease, increase, above
d) increase, increase, below

15. 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

16. Match the items given in Column I with those in Column II and select the correct option given below

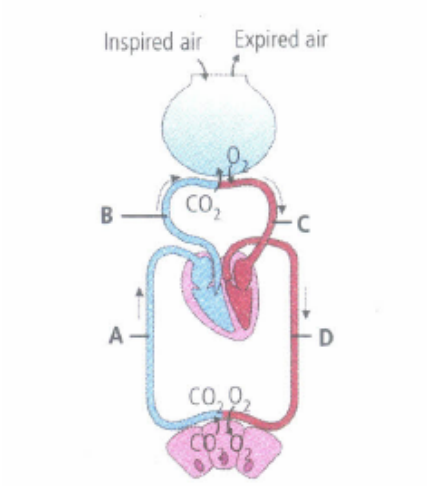
Column I	**Column II**
1. Tidal volume	i. 2500- 3000 mL
2. Inspiratory	ii. 1100 - 1200 mL reserve volume
3. Expiratory	iii. 500 - 550 reserve volume
4. Residual	iv. 1000 -1100 mL volume

    a) (i),(iv),(ii),(iii) b) (iii),(i),(iv),(ii) c) (iii),(ii),(i),(iv) d) (iv),(iii),(ii),(i)

17. Given below are few respiratory disorders. Identify occupational respiratory disorders among these.
    (j) 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)

18. One haemoglobin carries how many molecules of O_2?
    a) 4 b) 2 c) 6 d) 8

19. The given figure shows diagrammatic representation of exchange of gases at the alveolus and the body tissues with blood and transport of oxygen and carbon dioxide. Identify the blood vessels 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 artery

d)

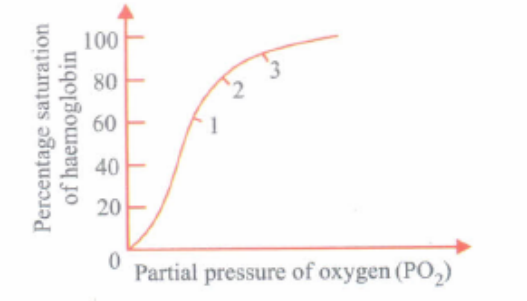
A	B	C	D
Systemic vein	Pulmonary vein	Pulmonary artery	Systemic artery

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

21. 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 intraalveolar pressure.

22. **Assertion:** Asthma is a difficulty in breathing causing 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 but 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.

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



Where in the body will haemoglobin be saturated at the percentages shown at points 1, 2 and 3 on the graph?

a)

left ventricle	Pulmonary vein	Vena cava
1	2	3

b)

left ventricle	Pulmonary vein	Vena cava
2	1	3

c)

left ventricle	Pulmonary vein	Vena cava
2	3	1

d)

left ventricle	Pulmonary vein	Vena cava
3	2	1

24. **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 but 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

25. During CO_2 transport, HCO_3^- diffuses from erythrocytes to plasma and in turn upsets the ionic balance momentarily. In order to keep the ionic balance, an equal number of Cl^- pass into the erythrocytes from plasma. The process is known as:
a) Hamburger phenomenon b) bicarbonate shift c) carbonation d) Bohr's effect.

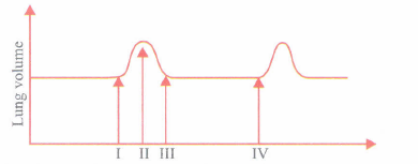
26. CO_2 dissociates from carbamino haemoglobin when
a) PCO_2 is high and PO_2 is low b) PO_2 is high and PCO_2 is low c) PCO_2 and PO_2 are equal
d) none of the above.

27. From the following relationships between respiratory volumes and capacities, mark the correct option.
(i) Inspiratory Capacity (IC) = Tidal Volume + Residual Volume
(ii) Vital Capacity (VC) =Tidal Volume (TV)+ Inspiratory ReserveVolume (IRV) + Expiratory ReserveVolume (ERV)
(iii) Residual Volume (RV) = Vital Capacity (VC) - Inspiratory ReserveVolume (IRV)
(iv) Tidal Volume (TV) = Inspiratory Capacity (IC) - Inspiratory ReserveVolume (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

28. The inspiratory reserve volume + tidal volume + expiratory reserve volume is the same as:
a) inspiratory capacity + expiratory reserve volume
b) total lung capacity - functional residual capacity
c) inspiratory capacity + functional residual capacity d) inspiratory capacity + residual volume.

29. **Assertion:** Chloride shift is exchange of Cl- of plasma and HCO^-_3 of RBCs.
Reason: Chloride shift maintains an acid base balance between the RBCs 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 but 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

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



The change 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.

31. 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

32. Respiration in insects is called direct because:
a) the cells exchange O/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/CO_2 directly with the air outside through body surface
d)
tracheal tubes exchange O_2/CO_2 directly with the haemocoel which then exchange with tissues.

33. **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 respiratory rhythm 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 but 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.

34. The enzyme that increases the reaction rate between CO_2 and H_2O in red blood cells is
a) carbonic anhydrase b) adenylate cyclase c) carbonic synthetase
d) alkaline phosphatase.

35. The majority of carbon dioxide produced by our body cells is transported to the lungs____
a) as bicarbonates b) as carbonates c) attached to hemoglobin d) dissolved in the blood

36. After forceful inspiration, the amount of air that can be breathed out by maximum forced expiration is equal to
a)
Inspi ratoryReserveVol u me (I RV)+ Expi ratoryReserve Volume (ERV) + Tidal Volume (TV) + Residual Volume (RV)
b) IRV + RV + ERV c) IRV + TV + ERV d) TV + RV + ERV.

37. 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

38. Consider the following four statements and select the correct option stating which ones are true (T) and which ones are false (F).
(i) Expiration is normally brought 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 haernoqlobin.

a)

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

b)

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

c)

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

d)

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

39. 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) decreases the affinity of haemoglobin to oxygen but increases its affinity to hydrogen
d) decreases the affinity of haemoglobin to both oxygen and hydrogen.

40. Complete the following sentences by selecting the correct option.
(A) Inspiratory capacity (IC) =___(i)_____ + IRV
(B)___(ii)____= TV + IRV + ERV
(C) Functional 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

41. 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 ad 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

42. **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 but 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

43. Among the following the partial pressure of oxygen is maximum in
a) alveolar air b) arterial blood c) venous blood d) expired air

44. Carbon dioxide is transported from tissues to respiratory surface by only_____
a) plasma and erythrocytes b) plasma c) erythrocytes d) erythrocytes and leucocytes

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

a) inspiratory Reserve volume b) Tidal Volume c) ExpiratoryReserve Volume

d) Residual Volume

46. Lungs do not collapse between breathe and some air always remain in the lungs which can never be expelled because:

a) There is a negative pressure in the lungs

b) There is a negative intrapleural pressure pulling at the lung walls

c) There is a positive intrapleural pressure

d) Pressure in the lungs is higher than the atmospheric pressure

47. Which of the following options correctly represents the lung conditions in asthama and emphysema, respectively?

a) Increased respiratory surface; Inflammation of bronchioles

b) Increased number of bronchioles; Increased respiratory surface

c) Inflammation of bronchioles; Decreased respiratory surface

d) Decreased respiratory surface; Inflammation of bronichioles

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

Column I	Column II
A. Carbamino-haemoglobin	(i) Inspiration
B. Diaphragm	(ii) Hamburger's phenomenon
C. Larynx	(iii) Diffusion of Cf into RBCs
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)

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

a) Increased respiratory surface; Inflammation of bronchioles

b) Increased number of bronchioles; Increased respiratory surface

c) Inflammation of bronohioles; Decreased respiratory surface

d) Decreased respiratory surface; Inflammation of bronchioles

50. Which of the following equations is correct?

a) $CO_2 \rightarrow H_2O \rightarrow HCO_3^- + H^+$ b) $CO_2 + H_2O \underset{anhydrase}{\overset{Carbanic}{\rightleftharpoons}} H_2CO_3 \underset{anhydrase}{\overset{Carbonic}{\rightleftharpoons}} H^+ + HCO_3^-$

c) $CO_2+H_2O \longrightarrow CH_4+2O_2$ d) $CO_2+H_2O \rightleftharpoons CO+H_2O_2$

51. Following are few characters of a disorder in human body.

(i) Inflammation of the mucous membrane of nasal passage

(ii) Watery secretions by mucous glands

(iii) Continuous sneezing

(iv) Eyewatering

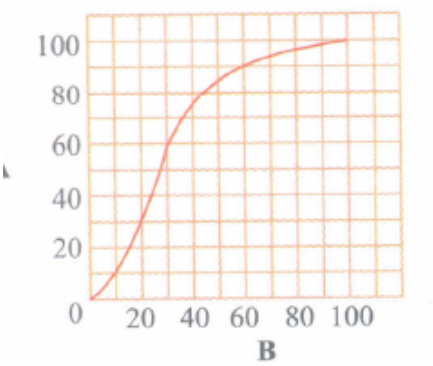
(v) Rise in body temperature

Identify the disorder from the choices given below.

a) Diphtheria b) Rhinitis c) Bronchial carcinoma d) Emphysema

52. Visiting high mountains may cause altitude sickness in men living in plain areas. Prime cause 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.
53. Which one of the following statements is incorrect?
    a) The principle of countercurrent flow facilitates efficient respiration in gills of fishes.
    b) The residual air in lungs slightly decreases the efficiency of respiration 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.
54. What is the vital capacity of our lungs?
    a) Totallungs capacity minus residual volume b) Inspiratory reserve volume plus tidal volume
    c) Total lungs capacity minus expiratory reserve volume
    d) Inspiratory reserve volume plus expiratory reserve volume
55. The quantity 1500 mL in the respiratory volumes of a normal human adult refers to____
    a) maximum air that can be breathed in and breathed out b) residual volume
    c) expiratory reserve volume d) total lung capacity
56. 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
57. Which of the following options is incorrect about the larynx (sound box)?
    a) It is a bony box b) Glottis is the opening into the larynx.
    c) During swallowing of food glottis is covered by epiglottis to prevent food entry into the larynx.
    d) All of these
58. Reduction the pH of blood will:
    a) Reduce the blood supply to the brain b) Decrease the affinity of haemoglobin with oxygen
    c) Release bicarbonate ions by the liver d) Reduce the rate of heartbeat
59. Select the correct events that occur during inspiration.
    (a) Contraction of diaphragm
    (b) Contraction of external inter costal muscles
    (c) Pulmonary volume decreases
    (d) Intra pulmonary pressure increases
    a) (a), (b) and (d) b) only (d) c) (a) and (b) d) (c) and (d)
60. Read the given statements and select the correct option.
    Statement 1: Mammals can eat while breathing.
    Statement 2: Mammals have negative-pressure breathing
    a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
    c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect

61. 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 haemoglobin 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.

62. **Assertion:** The lungs are situated in thoracic chamber which is anatomically an air-tight chamber.
Reason: Such an arrangement is essential to avoid any 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 but 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

63. The urge to inhale in humans results from:
a) rising PCO_2 b) rising PO_2 c) falling PCO_2 d) falling PO_2.

64. 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%.

65. 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

66. 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

67. Which one of the foliowing organs in the human body is most affected due to shortage of oxygen?
a) Intestine b) Skin c) Kidney d) Brain

68. 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 - PT
Chemosensitive area in medulla - C1
Peripheral chemoreceptors in aortic arch and carotid artery- C2
Find out the correct path for regulation of respiration.
a) $C_2 \longrightarrow R \longrightarrow PT \longrightarrow C_1$ b) $PT \rightarrow \underset{\uparrow}{R} \leftarrow C_2$ (↑ C_1) c) $C_1 \rightarrow \underset{\uparrow}{PT} \rightarrow C_2$ (↑ R) d) $PT \rightarrow \underset{\uparrow}{C_2} \leftarrow C_1$ (↑ R)

69. 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

70. Although much CO_2 is carried in blood, yet blood does not become acidic, because_____
a) it is absorbed by the leucocytes b) blood buffers play an important role in CO_2 transport
c) it combines with water to form H_2CO_3 which is neutralised by Na_2CO_3
d) it is continuously diffused through tissues and is not allowed to accumulate

71. 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 suit 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 respiratory rhythm centre. Neural signal from this centre can 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	Pneumotaxic centre

b)

(i)	(ii)	(iii)	(iv)
Respiratory rhythm centre	Pneumotaxic cxentre	Inspiration	Chemosensitive

c)

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

d)

(i)	(ii)	(iii)	(iv)
Pneumotaxic centre	Chemosensitive area	Inspiration	Respiratory rhythm centre

72. Emphysema is a condition resulting from
a) cigarette smoking b) liquor consumption c) drug addiction
d) reduced oxygen carrying capacity of blood

73. Blood carries the CO_2 in three forms. The correct percentages of CO_2 in these forms are
a)

As carbaminohaemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(a) 20 - 25%	70%	7%

b)

As carbaminohaemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(b) 70%	20-25%	7%

c)

As carbaminohaemoglobin in RBC	As bicarbonates	Dissolved form in plasma
(c) 20-25%	7%	70%

d)

As carbaminohaemoglobin in RBC	As bicarbonates	Dissolved form in plasma
7%	20-25%	70%.

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

a) Botulism b) Silicosis c) Anthracis d) Emphysema

75. Consider the following statements each with two blanks.
(i) Diaphragm contracts to help in___(1)___while the contraction of abdominal muscles helps in ___(2)___.
(ii) Vital capacity of trained athletes is___(3)____than that of non-athletes while the vital capacity of non-smokers is___(4)___than that of smokers.
(iii) Alveolar PO_2 is J5L than the venous PO_2 while arterial PO_2 is JQL than the alveolar PO_2 .
Which of the following 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

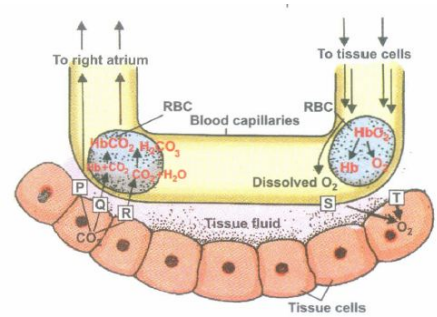
76. It is known that exposure to carbon monoxide is harmful to animals because
a) it reduces CO_2 transport b) it reduces O_2 transport c) it increases CO_2 transport
d) it increases O_2 transport.

77. Listed below are four respiratory capacities (i-iv) and four jumbled respiratory volumes of a normal human adult.

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

Which one of the following is the correct matching of two capacities and volumes?
a) (ii) 2500 mL, (iii) 4500 mL b) (iii) 1200 mL, (iv) 2500 mL c) (iv) 3500 mL, (i) 1200 mL
d) (i) 4500 mL, (ii) 3500 mL

78. 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%	75

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%

79. Carbonic anhydrase occurs in____
a) lymphocytes b) blood plasma c) RBC d) leucocytes

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

Column I (Animals)	**Column II (Respiratory structures)**
A. Pigeon	(i) Book gills
B. Scorpion	(ii) Pharyngeal wall

C. Planaria	(iii) Lungs
D. Earthworm	(iv) Gills
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), Hi), G-(iv), H-(iv)

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

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

d) A-(i) , B-(v), C-Ivii), D-(iii), E-(vii), F-(ii), G-(iv), H-(vi)

81. When CO_2 concentration in blood increases, breathing becomes_____
a) faster and deeper b) shallower and slow c) there is no effect on breathing
d) slow and deep

82. Approximately seventy percent of carbon-dioxide absorbed by the blood will be transported to the lungs___
a) as bicarbonate ions b) in the form of dissolved gas molecules c) by binding to R.B.C.
d) as carbamino - haemoglobin

83. **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 but 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.

84. The oxygen - haemoglobin dissociation curve will show a right shift in case of
a) high PCO_2 b) high PO_2 c) low PCO_2 d) less H^+ concentration

85. Bulk of carbon dioxide released from body tissues into the blood is present as:
a) Bicarbonate in blood plasma and RBCs b) Free CO_2 in blood plasma
c) 70% carbamino-haemoglobin and 30% as bicarbonate d) Carbamino-haemoglobin in RBCs

86. Read the given statements and select the correct option.
Statement 1: 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 statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.

c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.

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

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

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

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

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

a) Internal intercostal muscles relax and diaphragm contracts

b) External intercostal muscles and diaphragm relax

c) Internal intercostal muscles contract and diaphragm relax

d) External intercostal muscles and diaphragm contract

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

a) External and internal intercostal muscles b) Diaphragm and abdominal muscles

c) Diaphragm and external intercostal muscles d) Diaphragm and intercostal muscles

90. Which of the following statements 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 transport about 80 percent 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

91. 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

92. The oxygen dissociation curve is

a) parabola b) slope c) sigmoid d) straight line

93. Name the chronic respiratory disorder caused mainly by cigarette smoking:

a) Asthma b) Respiratory acidosis c) Respiratory alkalosis d) Emphysema

94. 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)____than the atmospheric pressure. Expiration takes place when intra pulmonary pressure is___(iii)____than the atmospheric pressure. 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	decreases

c)

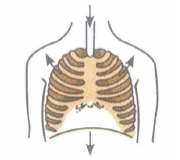
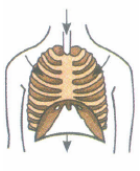
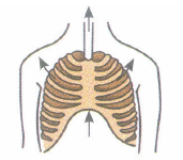
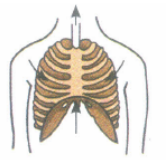
(i)	(ii)	(iii)	(iv)	(v)
pressure gradient	higher	less	relaxation	decreases

d)

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

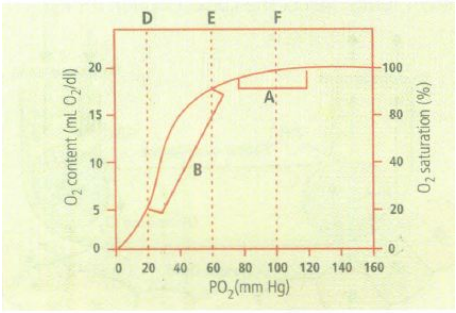
95. Exhalation is the process of expulsion of air through the respiratory tract. Which figure illustrates the process of exhalation?

(A) (B) (C) (D)

a)  b)  c)  d) 

96. Two friends are eating together on a dining table. One of them suddenly starts coughing while swallowing some food. This coughing would have been due to improper movement of
a) Tongue b) Epiglottis c) Diaphragm d) Neck

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



a) 15 mL of 0/100 mL of blood b) 70 mL of 0/100 mL of blood c) 5 mL of O_2/ 100 mL of blood
d) 20 mL of O_2/ 100 mL of blood

98. Respiratory Quotient (RQ) value of tripalmitin is____
a) 0.7 b) 0.07 c) 0.09 d) 0.9

99. 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

100. 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)

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

c)

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

d)

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

101. If alveolar ventilation is 4200 mL/min, respiratory frequency is 12 breaths per minute, and tidal volume is 500 mL, what is the anatomical-dead-space ventilation?
a) 1800 mL/min b) 6000 mL/min c) 350 mL/min d) 1200 mL/min

102. Read the following four statements (i) - (iv) with certain mistakes in two of them.
(i) A water breather expends much more energy in ventilating its respiratory surface than an airbreathing one.
(ii) Lungs become empty after forceful expiration.

(iii) Exchange of gases in the lungs is interrupted during expiration.
(iv) Respiratory movements 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)

103. The ventilation movements of the lungs in mammals are governed by
a) muscular walls of lung b) diaphragm c) costal muscles d) both (b) and (c).

104. 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.

105. Which of the following structures close the glottis during swallowing to prevent the entry of food into wind pipe?
a) Tongue b) Epiglottis c) Diaphragm d) Larynx

106. Vital capacity of lungs is
a) IRV + ERV b) IRV + ERV + TV - RV c) IRV + ERV + TV + RV d) IRV + ERV + TV.

107. **Assertion:** Vocal cords consist 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 but 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

108. Skin is an accessory organ of respiration in____
a) human b) frog c) rabbit d) lizard

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

Column I	**Column II**
A. Trachea	(i) PO_2 in 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. 100 mm Hg	(vii) Ethanol
H. Vocal cords	(viii) Branchial respiration

a) A-(iii), B-(iv), C-(vii), D-(vi), E-(viii), F-(ii), G-(i), H-(v)
b) A-(v), B-(ii), C-(vii), D-(viii), E-(vi), F-(iv), G-(i), H-(iii)
c) A-(vi), B-(iv), C-(viii), D-(v), E-(i), F-(ii), G-(iii), H-(vii)
d) A-(i), B-(v), C-(vii), D-(iii), E-(viii), F-(ii), G-(iv), H-(vi)

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

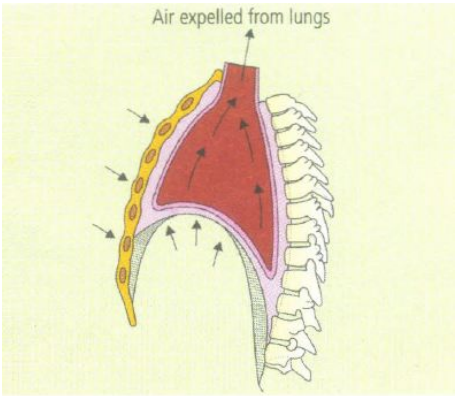
a) Pleurisy b) Emphysema c) Pneumonia d) Asthma

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

112. When temperature decreases, oxy-Hb curve becomes:
a) more steep b) straight c) parabola d) none of these.

113. Which of the following sequences is correct to initiate 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)

114. 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

115. 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 but 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

116. Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?
a) One can breathe out air totally without oxygen
b) One can breathe out air through eustachian tubes by closing both the nose and the mouth
c)
One can consiously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.
d) The lungs can be made fully empty by forcefully breathing out all air from them

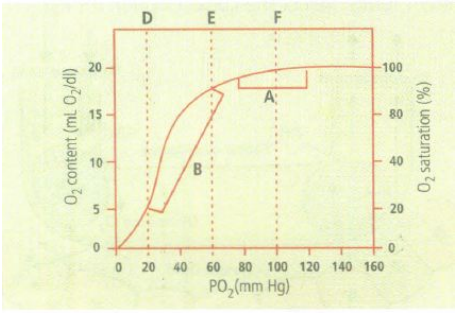
117. Oxygen dissociation curve of haemoglobin is_____

a) sigmoid b) hyperbolic c) linear d) hypobolic

118. A person suffers punctures in his chest cavity in an accident, without any damage to the lungs, its effect could be
a) reduced breathing rate b) rapid increase in breathing rate c) no change in respiration
d) cessation of breathing.

119. The alveolar epithelium in the lung is___
a) non-ciliated columnar b) non-ciliated squamous c) ciliated columnar d) ciliated squamous

120. 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.

121. Read the given statements and select the correct option.
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 statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.

122. **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 but 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

123. Bulk of oxygen diffuses from the plasma into the red blood corpuscles where it joins loosely with Fe^{2+} ions of haemoglobin (Hb) to form bright red oxyhaemoglobin (HbO_2). The process is called
a) oxidation b) oxygenation c) hydration d) dehydrogenation

124. 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

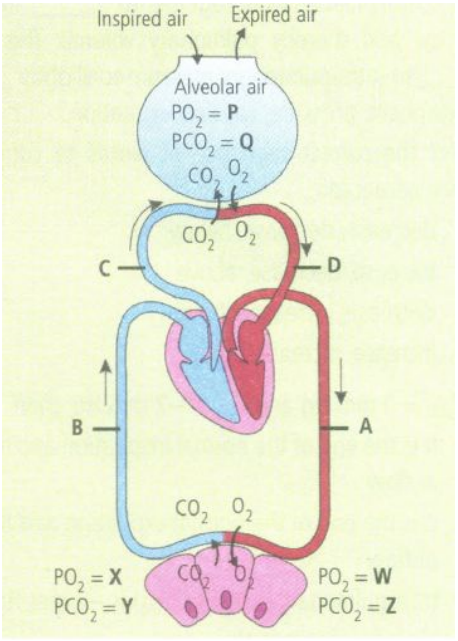
125. In man and mammals, air passes from outside into the lungs through
a) nasal cavity, larynx, pharynx, trachea, bronchi, alveolisd
b) nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli
c) nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli
d) nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli.

126. Which one of the following statements about blood constituents and transport of respiratory gases is most accurate?
a) RBCs transport oxygen where as WBCs transport CO_2
b) RBCs transport oxygen where as plasma transports only CO_2

c) RBCs as well as WBCs transport both oxygen and CO_2

d) RBCs as well as plasma transport both oxygen and CO_2

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



a)

W	X	Y	Z
95	40	45	40

b)

W	X	Y	Z
95	40	40	45

c)

W	X	Y	Z
40	45	95	40

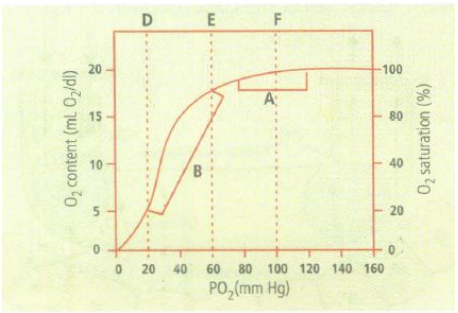
d)

W	X	Y	Z
95	45	40	40

128. 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

129. 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

130. Read the following four statements 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.

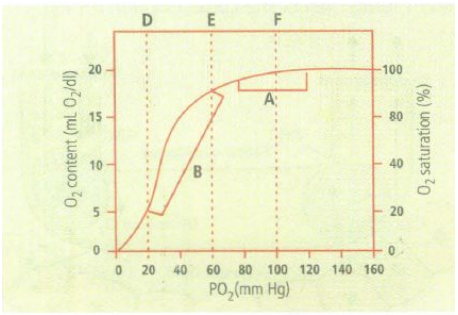
(iii) During swallowing epiglottis can be covered by a thin elastic cartilaginous flap called glottis to prevent the entry of food into the larynx.

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

Which of the above two statements are correct?

a) (ii) and (iii) b) (iii) and (iv) c) (i) and (ii) d) (i) and (iv)

131. 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 tissues 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.

132. The carbon dioxide is transported via blood to lungs as___
a) dissolved in blood Plasma b) in the form of carbonic acid only
c) in combination with haemoglobin only d) carbaminohaemoglobin and as carbonic acid

133. Which of the following statements 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 man can inspire approximately 500 mL of air per minute.

134. Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL, respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?
a) 1500 mL b) 1700mL c) 2200 mL d) 2700 mL

135. A large proportion of oxygen is left unused in the human blood even after its uptake by the body tissues, This O_2 _____ .
a) aets as a reserve during muscular exercise b) raise the pCO_2 of bloodto 75 mm of Hg.
c) is enough to keep oxyhaemoglobin saturation at 96%
d) helps in releasing more O_2 to the epithelial tissues

136. Which structure of man is similar to spiracle of cockroach?
a) Nostril b) Bronchiole c) Lung d) Alveolus

137. According 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

138. At high altitude, the RBCs in the human blood will____
a) increase in size b) decrease in size c) increase in number d) decrease in number

139. 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)

140. Haldane effect plays more important role in promoting carbon dioxide transport than that of the Bohr's effect in promoting oxygen transport because

a)

oxyhaemoglobin is a stronger acid which donates hydrogen ion (H^+) which in turn displace carbon dioxide from blood

b)

carbaminohaemoglobin is a stronger acid which splits into hydrogen ion (H^+) and bicarbonate (HCO^-_3)

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.

141. The process of migration of chloride ions from plasma to RBC and of carbonate ions from RBC to plasma is___

a) chloride shift b) ionic shift c) atomic shift d) Na^+ Pump

142. The respiratory centre in the brain is stimulated 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.

143. 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 (b)

144. Consider the following statements each with two blanks.

(i) Actually, only about___(1)___mL of air enters the lung 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 blank numbers from (1) to (6) in the above statements?

a) (3)-vital capacity, (4)-4000 mL, (5)-500, (6)-tidal

b) (1)-1 00, (2)-residual volume, (3)-functional residual capacity, (4)-3000 mL

c) (1)-350, (2)-dead space air, (5)-1000, (6)-inspiratory reserve

d) (1)-350, (2)-residual volume, (3)-vital capacity, (4)-4000 mL

145. Which of the following is true 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

146. If P_{atm}= 0 mm Hg 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.

147. Identify the wrong statement with reference to transport of oxygen_____
a) Higher H^+ conc. in alveoli favours the formation of oxyhaemoglobin
b) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin
c) Binding of oxygen with haemoglobin is mainly related to partial pressure of O_2
d) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.

148. Read the given statements and select the correct option.
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 statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct. d) Both statements 1 and 2 are incorrect.

149. Carbon monoxide can kill a person because of it's extremely high affinity for
a) haemoglobin b) phytochrome c) cytochrome d) none of these

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

Column I	Column II
A. TV + ERV	(i) Expiratory capacity
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)

151. Pneumotaxic centre which can moderate the functions of the respiratory rhythm centre is present in
a) pons region of brain b) thalamus c) spinal cord d) right cerebral hemisphere.

152. The partial pressure of oxygen in the alveoli of the lungs is:
a) Equal to that in the blood b) More than that in the blood c) Less than that in the blood
d) Less than that of carbon dioxide

153. Complete the following sentence by selecting the correct option.
Receptors associated 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^+	pneumotaxic centre

c)

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

d)

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

154. During expiration, the diaphragm becomes
a) dome-shaped b) oblique c) concave d) flattened.

155. The exchange of gases in the alveoli of the lungs takes place by____
a) simple diffusion b) osmosis c) active transport d) passive transport

156. **Assertion:** Emphysema is the permanent abnormal inflation of airspace of terminal bronchioles or alveolar sacs.
Reason: 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 but reason is not the correct explanation of assertion.

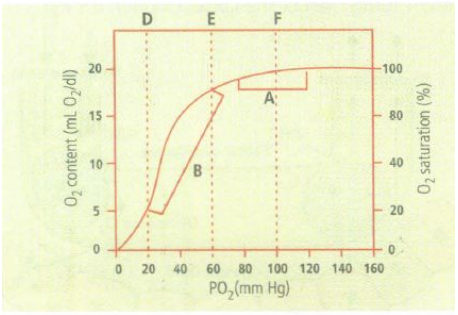
c) If assertion is true but reason is false. d) If both assertion and reason are false.

157. **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 additional 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 but 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

158. 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

159. Mammalian lungs have an enormous number of minute alveoli (air sacs). This is to allow
a) more surface area for diffusion 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.

160. Which two of the following changes (i-v) usually tend to occur in the plain dwellers when they move to high altitudes (3,500 m or more)?
(i) Increase in red blood cell size
(ii) Increase in red blood cell production
(iii) Increased breathing rate
(iv) Increase in thrombocyte count Changes occurring are:
a) (ii) and (iii) b) (iii) and (iv) c) (i) and (iv) d) (i) and (ii)

161. Read the given statements characterising 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	Millipede	Toad

162. 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)____.
(iii) Amount of air inhaled and exhaled with maximum effort is referred to as the___(5)____of the lungs.
Fill 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) - gills, (5) - tidal volume

163. Thoracic chamber is formed dorsally by the____(i)_____, ventrally by the_____(ii)_____laterally by the_____(iii)____and on lower side by the dome shaped____(iv)_____.
Select the correct option to complete the above paragraph.

a)

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

b)

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

c)

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

d)

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

164. 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) Insect
G. Diaphragm	(vii) Bicarbonates
	(viii) Earthworm

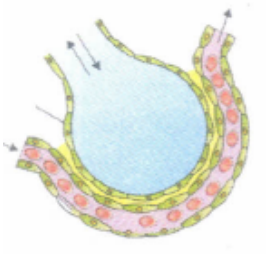
a) A-(viii), B-(vii), C-(i), D-(iv), E-(ii), F-(vi), G-(v) b) A-(vi), B-(vii), C-(v). D-(i), E-(ii), F-(viii). G-(iii)
c) A-(viii), B-(iv), C(vii). D-(i), E-(iii), F-(ii). G-(v) d) A-(vi), B-(i), C-(ii), D-(v). E-(iv), F-(viii), G-(iii)

165. **Assertion:** At the tissue level, 70 percent of CO_2 formed from catabolism is trapped as bicarbonate in the RBCs.
Reason: At tissue level, carbonic anhydrase in RBCs facilitates 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 but 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

166. Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct? The patient has been inhaling polluted air containing unusually high content of:
a) carbon disulphide b) chloroform c) carbon dioxide d) carbon monoxide.

167. 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 and CO_2 output c) Pulse rate d) All of these

168. 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.

169. **Assertion:** Inspiration 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 intra-pulmonary pressure than atmospheric pressure which forces the air from outside to move 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 but 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.

170. The CO_2 content by volume, in the atmospheric air is about
a) 3.34% b) 4% c) 0.0314% d) 2.1%