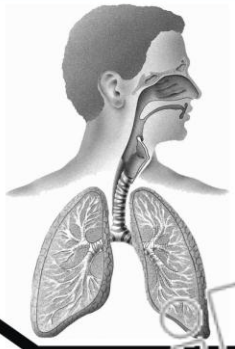


CH# 10 GASEOUS EXCHANGE

10.1 GASEOUS EXCHANGE IN PLANTS

LONG QUESTION

Q.1 Describe gaseous exchange in plants. *(K.B)* **(LHR 2016)**

OR

How do the different parts of the plant body exchange gases with the environment?
(Understanding the Concept Q.1)

Ans:

GASEOUS EXCHANGE IN PLANTS

Definition:

"Exchange of gases among **plants** and their **environments**, is termed as gaseous exchange in plants".

Organs and Organ Systems:

Plants have **no organs** or **organ systems** for the **exchange of gases** with the environment. **Every cell** of the **plant** body **exchanges gases** with the environment by its **own**.

But following parts and structures are used for the gaseous exchange in plants.

Through Stomata:

The **leaves** and **young stems** have **stomata** in their epidermis. The **gaseous exchange** occurs through these stomata.

Through Air Spaces:

The inner cells of leaves (mesophyll cells) and **stems** also have **air spaces** among them, which help in the **exchange of gases**.

Through Cuticle:

In **young stems** and **leaves**, some gaseous exchange also occurs through the **cuticle** which is present **over** their **epidermis.**

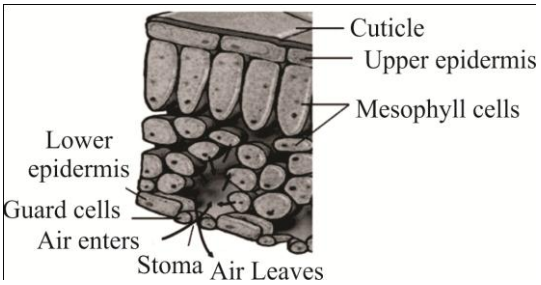


Figure: Gaseous Exchange in a Leaf

Situations in Plants Life:

Leaf cells face **two situations**.

- During day time
- During night time

During Day Time:

During the **day time,** when the **mesophyll cells** of leaves are carrying out **photosynthesis** and **respiration** side by side, the **oxygen produced** in photosynthesis is **utilized** in **cellular respiration**. Similarly, the **carbon dioxide produced** during **cellular respiration** is **utilized** in **photosynthesis**.

During Night Time:

During **night**, when there is **no photosynthesis** occurring, the **leaf cells** get **oxygen** from the **environment** and **release carbon dioxide** through **stomata**.

Through Lenticels:

In **woody stems** and **mature roots**, the entire **surface** is **covered** by **bark** which is **impervious** to **gases or water**. The lenticels **allow air** to **pass** through them.

Lenticels:

The **pores** in the **layer of bark** are called as **lenticels**.

Location of Lenticels:

The **lenticels** are **found** on stems and **slightly** more **raised** than the **general surface** of the **stem**.

Through Roots:

Gases diffuse in and out of the **general surface** of the **young roots**. The gases are **found** in the **soil surrounding** the **roots**.

Aquatic Plants:

The **aquatic plants** get the **oxygen dissolved in water** and **release carbon dioxide** in the **water**.

SHORT QUESTIONS

Q.1 What are stomata? ***(K.B)*** **GRW 2015**

Ans:

STOMATA

Stomata are the small openings in the epidermis of leaves and young stems for gaseous exchange.

Q.2 Define cellular respiration. ***(K.B)***

Ans: **CELLULAR RESPIRATION** **(MTN 2015)**

Definition:

"Cellular respiration is the process in which the C–H bonds in food are broken by oxidation reductions reactions and energy is transformed into ATP."

Q.3 Define gaseous exchange. ***(K.B)***

Ans: **GASEOUS EXCHANGE**

Definition:

"Taking in oxygen and giving out of carbon dioxide is termed as gaseous exchange."

Q.4 Difference between breathing and cellular respiration. ***(K.B)*** **(GRW 2015, LHR 2015)**

Ans: **DIFFERENTIATTION**

The differences between breathing and cellular respiration are as follows:

Breathing	Cellular Respiration
• The process through which animals take air in their bodies to get oxygen from it and then give out the air for getting rid of carbon dioxide is called breathing.	• The process in which the carbon-hydrogen bonds in the food are broken by oxidation reduction reactions and the energy is transformed into ATP is called cellular respiration.
• Breathing is only the mechanical or physical process for the exchange of gases.	• Respiration involves the mechanical and the bio chemical processes.
• No energy is produced.	• Energy is produced in the form of ATP.
• It occurs at organ system level and respiratory system is involved.	• It occurs at cell level.

Q.5 How gaseous exchange occurs in young stems and leaves? ***(U.B)*** **(GRW 2016, GRW 2015)**

Ans: Page no 02.

Q.6 What are lenticels? Describe their function. ***(K.B)*** **(GRW 2015, 17 LHR 2015, 17)**

Ans: Page no 02.

Q.7 How gaseous exchange takes place in young roots? ***(U.B)***

Ans: Page no 02.

Q.8 How gaseous exchange takes place in aquatic plants? ***(U.B)***

Ans: Page no 02.

Q.9 Define cuticle. ***(K.B)*** **(GRW 2016)**

Ans: Page no 02.

Q.10 How can you find out location of lenticels on stem of plants? ***(U.B)***

Ans: Page no 02.

10.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following do not contain C-H bonds? *(U.B)*
(A) Carbohydrates (B) Proteins
(C) Vitamins (D) Minerals

2. Which bonds in food are broken during oxidation-reduction reactions? *(A.B)*
(A) C–H (B) C–N
(C) C–O (D) C–S

3. Which process stops during night time? *(U.B)*
(A) Respiration (B) Breathing
(C) Gaseous exchange (D) Photosynthesis

4. Complete oxidation of food requires the presence of: *(K.B)*
(A) Oxygen (B) Nitrogen
(C) Hydrogen (D) CO_2

5. Respiration is a: *(K.B)*
(A) Physical process (B) Bio-chemical process
(C) Mechanical process (D) Geo-chemical process

6. In plants, the gaseous exchange occurs through: *(K.B)*
(A) Stomata (B) Cuticle
(C) Lenticels (D) All of these

7. The process that takes place during day time in plants to produce food: *(U.B)*
(A) Respiration (B) Breathing
(C) Gaseous exchange (D) Photosynthesis

8. In woody stem and mature roots, the entire surface is covered by: *(K.B)*
(A) Wood (B) Bark
(C) Cambium (D) Lenticels

9. Stomata are frequently present on: *(K.B)* **(LHR 2016)**
(A) Upper side of leaf (B) Lower side of leaf
(C) Both sides of leaf (D) Stem

10. The gas produced in mesophyll cells as by product during day time is called: *(K.B)* **(LHR 2016, GRW 2013)**
(A) Carbon dioxide (B) Oxygen
(C) Nitrogen (D) Ammonia

11. The oxygen produced in photosynthesis is utilized in : *(U.B)*
(A) Cellular respiration in plants (B) Cellular respiration in animals
(C) Cellular respiration in Fungi & bacteria (D) All of these

12. Slightly raised structure of stem is : *(K.B)*
(A) Stomata (B) Bark
(C) Lenticels (D) Cambium

13. Most of the gaseous exchange in a leaf occurs through: *(K.B)* **(SWL 2015)**
(A) Stomata (B) General surface
(C) Cuticle (D) Lenticels

14. In young stems and leaves, some gaseous exchange also occurs through _____ which is present over the epidermis: *(K.B)* **(LHR 2016)**
(A) Cortex (B) Endodermis
(C) Cuticle (D) Stomata

15. The aquatics plants get the _____dissolved in water and release _____ in the water: *(K.B)*
(A) Nitrogen, Carbon dioxide (B) Carbon monoxide, oxygen
(C) Oxygen, Carbon dioxide (D) Hydrogen, oxygen

10.2 GASEOUS EXCHANGE IN HUMANS

LONG QUESTIONS

Q.1 Discuss air passageway in humans. ***(K.B)***

Ans:

HUMAN RESPIRATORY SYSTEM

Definition:

"Taking in oxygen and giving out of carbon dioxide is termed as gaseous exchange."

Explanation:

In **humans** and other **higher animals**, the **exchange of gases** is carried out by the **respiratory system.**

The human respiratory system consists of two parts:

- The air passageway
- The lungs

The Air Passageway:

The **air passageway consists** of the **parts** through which the **outside air comes** in the **lungs** and **after the exchange of gases** it **goes out**. This passage of air consists of the following **parts**:

- External Nostrils
- Nasal cavity
- Internal Nostrils
- Pharynx
- Larynx
- Trachea
- Bronchi
- Bronchioles
- Alveolar Ducts
- Alveoli

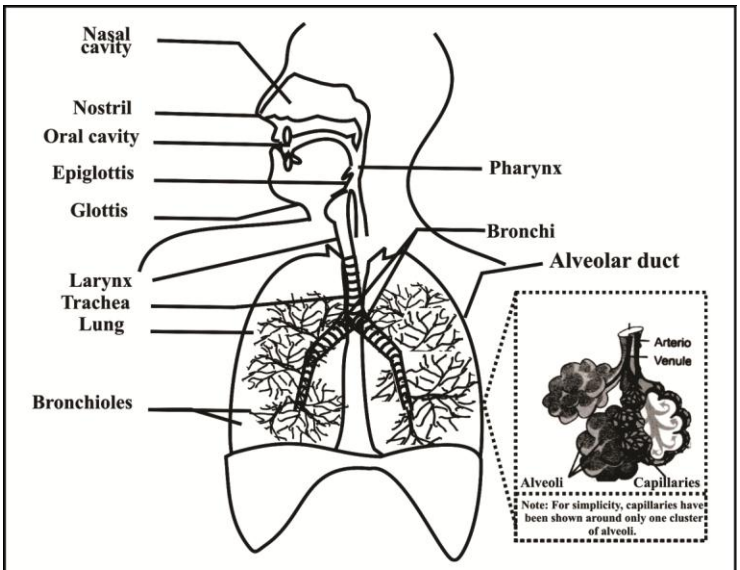


Figure: The Air Passageway and the Lungs

External Nostrils:

The **nasal cavity opens** to the **outside** through the **openings** called **external nostrils**.

Nasal Cavity:

The **nose encloses** the **nasal cavity.** The nasal cavity is divided into **two portions** by a wall. **Each** portion is **lined by fine hairs** and **mucous** which **filter the dust particles** from the air. The **mucous** also **moistens** and **warms** the **incoming air** and keeps its **temperature** nearly **equal to that of the body**.

Internal Nostrils:

The **nasal cavity opens** into **pharynx** by means of **two small openings** called **internal nostrils**.

Pharynx:

Pharynx is a **muscular passage** and is common to **both food and air**. It **extends** to the **opening of oesophagus** and the **larynx**.

Larynx:

The **air goes** from the **pharynx** into the **larynx**. The **larynx** is the **box** made of **cartilage**. It is present **between pharynx and trachea**. It is also called as **voice box**.

Glottis:

Glottis is a **narrow opening** at the **floor** of the **pharynx** which **leads** into **larynx**.

Epiglottis:
The **glottis** is guarded by a **flap of tissue** called the **epiglottis**.
Vocal Cords:
Two pairs of **fibrous bands** called **vocal cords** are stretched across the **larynx**. The vocal cords **vibrate** when the **air passes** through them. This vibration **produces sounds**.
Trachea:
Larynx continues to the **trachea**, which is also called as **windpipe**. It is about **12 cm long tube** which lies **in front** of the **oesophagus**. There are **C-shaped cartilaginous rings** in the wall of trachea. The **cartilages keep** the **trachea** from **collapsing** even when there is **no air in it**.
Bronchi:
On **entering** the **chest cavity**, the **trachea divides** into **two smaller tubes** called **bronchi**. The singular of bronchi is bronchus. The bronchi also have **cartilaginous plates** in their **walls**. Each **bronchus** enters into the **lung** of its **side** and then **divides** into **smaller branches**.
Bronchioles:
The **bronchi** continue **dividing** in the lungs until they **make several fine tubes** called **bronchioles**.
Alveolar Ducts:
The **bronchioles** progressively **lose** the **cartilage** and they become **narrower**. The bronchioles end as **fine tubules** called the **alveolar ducts**.
Alveoli:
Each **alveolar duct opens** into a **cluster of pouches** called **alveoli**. The alveoli **form** the **respiratory surface** in human body. Each alveolus is a **sac like** structure **lined** by a **single layer** of **epithelial cells**. It is bound on the **outside** by a **network** of **capillaries**.
Working of Lungs:
The **pulmonary artery** from the **heart** containing **deoxygenated blood** enters the **lungs** and branches into **arterioles** and then into **capillaries** which surround the alveoli. These then **join** together to **form** the **venules** which form **pulmonary vein**. The pulmonary vein **carries** the **oxygenated blood** back to the **heart**.

Q.2 Describe structure of lungs. ***(K.B)***

Ans:

THE LUNGS

Definition:
"**Muscular**, **spongy** and **elastic organs** used for the **gaseous exchange** in **higher animals** are called **lungs**". All the **alveoli** on **one side** constitute a **lung**."
There is a **pair of lung** in the **thoracic cavity**.

STRUCTURE OF LUNGS

Ribs and Intercoastal Muscles:
The **chest wall** is made up of **12 pairs** of **ribs** and the **rib muscles** called the **intercoastal muscles**.
Diaphragm:
A **thick muscular** structure, called **diaphragm** is present **below** the **lungs**.
Size:
The **left lung** is **slightly smaller** and has **two lobes** and the **right lung** is **bigger** with **three lobes**.
Elasticity:
The lungs are **spongy** and **elastic organs**.
Presence of Blood Vessels:
The lungs also have **blood vessels** that are the **branches** of **pulmonary arteries** and **veins**.

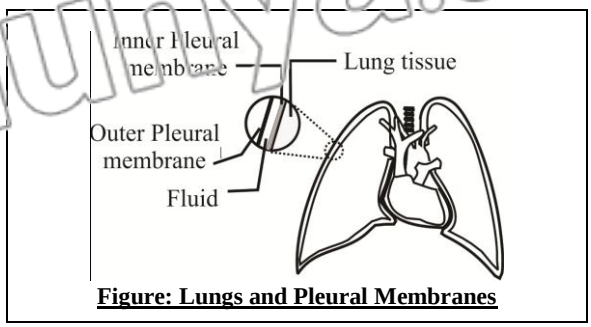


Figure: Lungs and Pleural Membranes

Internal Features of Lungs:

Bronchi:

On entering the chest cavity, the trachea divides into two smaller tubes called bronchi. The singular of bronchi is bronchus. The bronchi also have cartilaginous plates in their walls. Each bronchus enters into the lung of its side and then divides into smaller branches.

Bronchioles:

The bronchi continue dividing in the lungs until they make several fine tubes called bronchioles.

Alveolar Ducts:

The bronchioles progressively lose the cartilage and they become narrower. The bronchioles end as fine tubules called the alveolar ducts.

Alveoli:

Each alveolar duct opens into a cluster of pouches called alveoli. The alveoli form the respiratory surface in human body. Each alveoli is a sac like structure lined by a single layer of epithelial cells. It is bound on the outside by a network of capillaries.

Protection of Lungs:

Each lung is enclosed by two membranes called the outer pleural membrane and the inner pleural membrane. The membranes enclose a fluid which provides lubrication for the free expanding and contracting of the lungs.

Working of Lungs:

The pulmonary artery from the heart containing deoxygenated blood enters the lungs and branches into arterioles and then into capillaries which surround the alveoli. These then join together to form the venules which form pulmonary vein. The pulmonary vein carries the oxygenated blood back to the heart

10.2 SHORT QUESTIONS

Q.1 Show air passageway of human. ***(K.B)***

Ans: **AIR PASSAGEWAY OF HUMAN**

External nostrils→Nasal cavity→Internal nostrils→Pharynx →Larynx→Trachea→Bronchi→ Bronchioles→Alveolar duct→Alveoli.

Q.2 Define nasal cavity ***(K.B)*** **(LHR 2016)**

Ans: Page no 05.

Q.3 What is pharynx? ***(K.B)***

Ans: Page no 05.

Q.4 What is glottis and epiglottis? ***(K.B)*** **(MTN 2015, LHR 2014, GRW 2016)**

Ans: Page no 05,06.

Q.5 Define voice box. ***(K.B)*** **(LHR 2014, GRW 2017)**

Ans: Page no 06.

Q.6 Define vocal cards. ***(K.B)*** **(LHR 2016)**

Ans: Page no 06.

Q.7 How sound is produced? ***(K.B)***

Ans: **PRODUCTION OF SOUND**

Two pairs of fibrous bands called vocal cords are stretched across the larynx. The vocal cords vibrate when the air passes through them this vibration produces sound.

Q.8 What is trachea? Where is it located? ***(K.B)*** **(MTN 2015, LHR 2013, GRW 2017)**

Ans: Page no 06.

Q.9 What are bronchi? ***(K.B)***

Ans: Page no 06.

Q.10 What are bronchioles? ***(K.B)***

Ans: Page no 07.

Q.11 What are alveolar duct and alveoli? ***(K.B)***

Ans: Page no 07.

Q.12 What is pulmonary circulation? ***(K.B)***

Ans: Page no 06.

Q.13 Explain the production of speech. ***(U.B)*** **(SWL 2015)**

Ans:

PRODUCTION OF SPEECH

The vibration in vocal cords and the movements of lips, cheeks, tongue and jaws produce specific sound which results in speech. Speech is ability that only humans are gifted.

Q.14 Describe functions of glandular cells of trachea and bronchi. ***(A.B)***

Ans:

FUNCTIONS

The functions of glandular cell and bronchi are as follows:

The trachea and the bronchi are also lined with glandular cells. The glandular cells secrete mucus whish moistens the air and also traps any fine particle of dust or bacteria that have escaped the nasal charity.

Q.15 What are the roles of cilia in trachea and in bronchi? ***(A.B)***

Ans:

ROLES OF CILIA

The trachea and the bronchi are also lined with ciliated cells. The cilia beat with an upward motion so that the foreign particles along the mucous are sent to the oral cavity from where it may be either swallowed or coughed out.

Q.16 What is Larynx? Write its function ***(A.B)*** **LHR 2015**

Ans: Page no 06.

10.2 MULTIPLE CHOICE QUESTIONS

1. In how many portions, the nasal cavity is divided? (K.B)

(A) 1 (B) 2
(C) 3 (D) 4

2. Filtration of dust particles is controlled by : (U.B)

(A) Fine hairs in nasal cavity (B) Mucous
(C) Blood vessels (D) Both a & b

3. Which of the following moistens and warms the incoming air? (K.B)

(A) Fine hairs in nasal cavity (B) Mucous
(C) Blood vessels (D) Both a & b

4. Narrow opening at the floor of pharynx which leads to larynx: (K.B)

(A) Epiglottis (B) Glottis
(C) Nasal Cavity (D) Nostril

5. The glottis is guarded by a flap of tissue called: (K.B)

(A) Pharynx (B) Larynx
(C) Trachea (D) Epiglottis

6. How many pairs of fibrous bands are present in larynx? (K.B)

(A) 1 (B) 2
(C) 3 (D) 4

7. Pharynx is a muscular passage of: (K.B)

(A) 1 (B) 2
(C) 3 (D) 4

8. Larynx continues to the: (K.B)

(A) Bronchi (B) Bronchioles
(C) Trachea (D) Pharynx

9. Vocal cords are stretched across: (K.B)
(A) Larynx (B) Pharynx
(C) Trachea (D) Esophagus

10. Which one is a sac like structure form the respiratory surface in human body? (K.B)
(A) Bronchus (B) Trachea
(C) Alveolus (D) Larynx

11. Trachea is also termed as: (K.B)
(A) Windpipe (B) Voice box
(C) Air duct (D) Breathing centre

12. Which vessel contains deoxygenated blood? (K.B)
(A) Pulmonary artery (B) Pulmonary vein
(C) Coronary artery (D) Hepatic artery

13. The anatomy of osophagus is _____ to trachea : (K.B)
(A) Dorsal (B) Ventral
(C) Anterior (D) Posterior

14. How many ribs are present in chest wall? (K.B)
(A) 6 (B) 12
(C) 18 (D) 24

15. Alveoli are lined by: (K.B)
(A) Endothelial cells (B) Epithelial cells
(C) Epidermal cells (D) Mesodermal cells

16. The purpose of ribcage is: (A.B) **(GRW 2017)**
(A) Protection of stomach (B) Protection of heart and lungs
(C) Protection of spinal card (D) Protection of pharynx

17. Which statement is correct? (U.B)
(A) Left lung is smaller than right lung (B) Right lung is smaller than left lung
(C) Both lungs are equal in size (D) All statements are correct

18. Lobes present in right lung? (K.B) **(GRW 2017)**
(A) 1 (B) 2
(C) 3 (D) 4

19. How many lobes are present in left lung? (K.B)
(A) 1 (B) 2
(C) 3 (D) 4

20. Venules unite to form: (K.B) **(DGK 2015)**
(A) Pulmonary vein (B) Pulmonary arteries
(C) Trachea (D) Alveoli

21. The part of the air passage way which comes after larynx: (K.B)
(A) Pharynx (B) Trachea
(C) Bronchi (D) None

22. Each alveolar duct opens into a cluster of pouches called: (K.B)
(A) Bronchioles (B) Bronchi
(C) Alveoli (D) Trachea

23. The bronchi continue dividing in the lungs until they make several fine tubes called: (K.B)
(A) Bronchi (B) Trachea
(C) Bronchioles (D) Alveoli

24. The larynx is a box, made of cartilage, it is present between pharynx and trachea it is also called: (K.B)
(A) Trachea (B) Bronchi
(C) Voice box (D) Vocal cords

25. Each lung is enclosed by two membranes called: (K.B)
(A) Chest cavity (B) Pleural membranes
(C) Thoracic cavity (D) Lungs membrane

26. The length of the trachea is: (K.B)
(A) 13 cm (B) 14 cm
(C) 12 cm (D) 20 cm

27. In humans and higher animals, the exchange of gases is carried out by: (U.B)
(A) Skin (B) Respiratory surface
(C) Air passageway and lungs (D) Only lungs

28. Gaseous exchange occurs in human: (K.B) **(LHR 2017)**
(A) Alveoli (B) Bronchi
(C) Trachea (D) Pharynx

29. The capillaries surrounding the alveoli are joined to form _____, which carry oxygenated blood. *(K.B)*
(A) Arterioles (B) Arteries
(C) Veins (D) Venules

10.2.3 THE MECHANISM OF BREATHING

LONG QUESTION

Q.1 Explain mechanism of breathing. *(K.B)*

OR

Write down the steps of inhalation and exhalation. **(Understanding the Concept Q.2)**

Ans: **MECHANISM OF BREATHING**

Definition:

"The **physical movements** associated with the **gaseous exchange** are called **breathing**".

Explanation:

There are **two phases** of breathing.

- Inhalation or inspiration
- Exhalation or expiration

Inhalation/ Inspiration:

The following **changes** occur in the body during inhalation.

- During **inspiration**, the **rib muscles contract** and **ribs** are **raised**.
- The **dome** shaped **diaphragm contracts** and is **lowered**.
- These movements **increase** the **area** of the **thoracic cavity**, which **reduces** the **pressure** on lungs.
- The **lungs expand** and the **air pressure** within them also **decreases**.
- The **air from outside rushes into** the **lungs** to **equalize** the **pressure** on **both sides**.

Exhalation/Expiration:

After the **gaseous exchange** in the **lungs**, the **impure air** is **expelled out** in exhalation. The following **changes** occur in the body during exhalation.

- During **expiration**, the **rib muscles** relax bringing the **ribs back** to the **original position**.
- The **diaphragm** muscles also **relax** and it gets its **raised** dome shape.
- This **reduces the space** in the **chest cavity** and **increases** the **pressure** on lungs.
- The **lungs contract** and the **air is expelled** out of them.

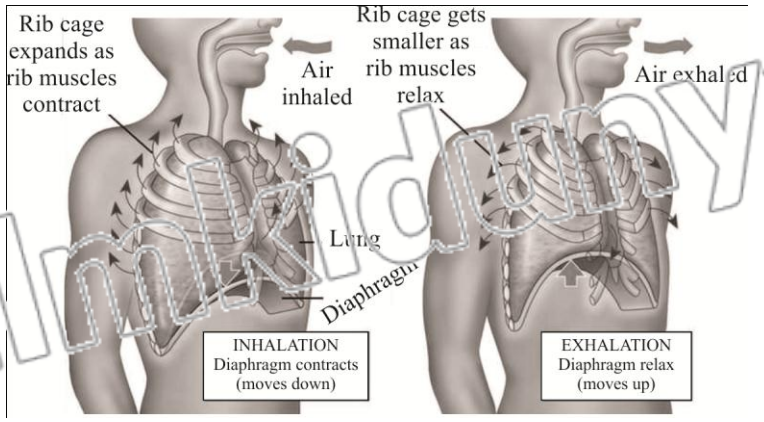


Figure: Steps of Inhalation **Figure: Steps of Exhalation**

Feature	Inspired Air	Expired Air
Amount of oxygen	21%	16%
Amount of carbon dioxide	0.04%	4%
Amount of nitrogen	79%	79%
Amount of water vapours	Variable	Saturated
Amount of dust particles	Variable	Almost none
Temperature	Variable	Almost equal to body temperature

Comparison between the Inspired and the Expired Air

Normal Breathing Rate of Human:

Humans breathe **16-20 times per minute** in **normal** circumstances (at rest condition).

Role of Respiratory Center:

The **rate** of **breathing** is **controlled** by the **respiratory center** in the **brain**. The respiratory centre is **sensitive** to the **concentration** of **carbon dioxide** in the **blood.** When we do exercise or some **hard job** our **muscle cells** carry out **cellular respiration** at **greater rate**. It **results** in the **production** of **more carbon dioxide** which is **released** in the **blood**. This greater than normal concentration of carbon dioxide **stimulates** the **respiratory centre** of brain. The respiratory centre **sends messages** to the **rib muscles** and **diaphragm** to **increase** the rate of **breathing** so that the **excess carbon dioxide** present in blood can be **removed out** of body.

Increase in Breath Rate:

During exercise or other **hard physical** works the **breathing rate** may **increase** up to **30-40 times per minute.**

10.2.3 SHORT QUESTIONS

Q.1 What is dead space? ***(U.B)*** **(LHR 2015)**

Ans: **DEAD SPACE**

The amount of air which is inhaled that doesn't take part in gaseous exchange is called dead space.

Q.2 Can we control breathing? ***(A.B)***

Ans: **CONTROL OF BREATHING**

We can control the rate of breathing but not for a long time. The breathing movements are involuntary to a large extent.

Q.3 Differentiate between inspiration and expiration ***(K.B)*** **(GRW 2016)**

Ans: **DIFFERENTIATION**

The differences between inspiration and expiration are as follows:

Inspiration	Expiration
• During inspiration, the rib muscles contract and ribs are raised.	• During expiration, the rib muscles relax bringing the ribs back to original position.
• The dome shaped diaphragm contracts and is lowered.	• The diaphragm muscles also relax and it gets its raised dome shape.
• These movements increase the area of the thoracic cavity and reduce pressure on lungs.	• This reduces the space in the chest cavity and increases the pressure on lungs.
• The lungs expand and the air pressure within them also decreases.	• The lungs contract and the air is expelled out of them.

Q.4 Give a comparison between inspired and expired air. ***(K.B)***

Ans: **COMPARISON**

The comparison between the inspired and expired air are as follows:

Feature	Inspired Air	Expired Air
Amount of oxygen	21%	16%
Amount of carbon dioxide	0.04%	4%
Amount of nitrogen	79%	79%
Amount of water vapours	Variable	Saturated
Amount of dust particles	Variable	Almost none
Temperature	Variable	Almost equal to body temperature

Q.5 What part of the blood transports oxygen to the body? ***(K.B)***

Ans: **TRANSPORT OF OXYGEN TO THE BODY**

Haemoglobin in red blood cells transport oxygen to the body.

10.2.3 MULTIPLE CHOICE QUESTIONS

1. Rate of breathing depends upon concentration of which gas in the blood? (A.B) (LHR 2014)
(A) Oxygen (B) Carbon dioxide
(C) Nitrogen (D) Hydrogen

2. During inspiration, the rib muscles: (K.B)
(A) Contract (B) Relax
(C) Expand (D) Elongate

3. During inspiration, the lungs: (K.B)
(A) Expand (B) Become small
(C) Contract (D) Decrease in size

4. A thick muscular structure below the lungs: (K.B) (GRW 2017)
(A) Kidney (B) Liver
(C) Diaphragm (D) Ureter

5. In human, normal breathing rate per minute: (K.B) (DGK 2014)
(A) 10-20 times (B) 10-15 times
(C) 16-20 times (D) 15-18 times

6. The respiratory center is sensitive to the concentration of which gas in blood? (U.B)
(A) Carbon monoxide (B) Carbon dioxide
(C) Ammonia (D) Oxygen

7. Temperature of inhaled air is: (U.B)
(A) Equal to body temperature (B) Higher than body temperature
(C) Depends on atmosphere (D) All of thsese

8. The respiratory centre is present in: (K.B) (LHR 2017)
(A) Lungs (B) Brain
(C) Nose (D) Muscles

9. During exercise or other hard physical work, the breathing rate per minute may increase up to: (A.B)
(A) 20-30 times (B) 25-35 times
(C) 30-35 times (D) 30-40 times

10. Amount of nitrogen in expired air: (K.B)
(A) 70% (B) 72%
(C) 76% (D) 79%

11. Percentage of carbon dioxide in expired air during breathing is: (K.B) (LHR 2015)
(A) 16% (B) 4%
(C) 21% (D) 0.04%

12. Water vapors in expired air: (K.B)
(A) Variable (B) Saturated
(C) Almost none (D) 100%

13. Dust particles in expired air: (K.B)
(A) Variable (B) Saturated
(C) Almost none (D) 50%

14. Amount of oxygen in expired air is: (K.B) (BWP 2015)
(A) 4% (B) 14%
(C) 16% (D) 20%

15. Amount of carbon dioxide in inspired air is: (K.B)
(A) 16% (B) 13%
(C) 0.04% (D) 4%

10.3 RESPIRATORY DISORDERS

LONG QUESTIONS

Q.1 What are the respiratory disorders? Write names of some respiratory disorders. (K.B)

Ans:

RESPIRATORY DISORDERS

There are number of respiratory disorders which affect people. The percentage of such disorders is particularly high in Pakistan. It is due to more concentration of air pollutants not only in the urban but also in the rural atmosphere. Some of the important respiratory disorders are given below:

- Bronchitis
- Emphysema
- Pneumonia
- Asthma
- Lung Cancer

Q.2 Explain bronchitis and its types. (A.B) **(Understanding the Concept Q.3)**

Ans:

BRONCHITIS

Etymology:

Bronchi/Bronchioles and Itis = Inflammation

Definition:

'The **inflammation** of the **bronchi** or **bronchioles** is called bronchitis'.

Normal Bronchus Inflamed Bronchus

Figure: Bronchi

Effects:

It results in excessive **secretions of mucus** into the **tubes**, leading to the **swelling** of **tubular walls** and **narrowing of tubes**.

Causes:

It is caused by:

- **Viruses**
- **Bacteria**
- **Exposure to chemical irritants** (e.g. tobacco smoke)

Types of Bronchitis:

There are **two major types** of bronchitis:

- Acute Bronchitis
- Chronic Bronchitis

Acute Bronchitis:

The **acute bronchitis** usually **lasts** about **two weeks** and patients **recover** with **no permanent damage** to the bronchi or bronchioles.

Chronic Bronchitis:

In **chronic bronchitis**, the **bronchi develop chronic inflammation**. It usually **lasts** for **three months** to **two years**. The majority of people **diagnosed** with chronic bronchitis are **45 years** of age or **older**.

Symptoms:

Symptoms of bronchitis include:

- **Cough**
- **Mild wheezing**
- **Fever**
- **Chills**
- **Shortness of breath** (especially when doing hard job).

Q.3 What is emphysema? Explain its symptoms. (A.B) **(Understanding the Concept Q.3)**

Ans: **EMPHYSEMA** **(GRW 2015)**

Definition:

"Emphysema is the **destruction** of the **walls** of the **alveoli**".

Effects:

It results in **larger sacs** but with **less surface** area for **gaseous exchange**. As **lung tissue breaks** down, the lungs **do not come back** to their **original shape** after **exhalation**. So, **air** cannot be pushed out and is **trapped** in the **lungs**.

Causes:

- **Smoking**
- **Severe air pollution**
- **Other chemical irritants**

Symptoms:

The symptoms of emphysema include:

- **Shortness of breath**
- **Fatigue**
- **Recurrent respiratory infections**
- **Weight loss**

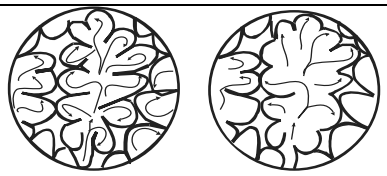


Figure: The Alveoli

Appearance of Symptoms:

By the time the **symptoms** of emphysema **appear**, the patient has usually **lost 50% to 70%** of his/her **lung tissue**.

Level of Oxygen in Blood:

The **level** of **oxygen in blood** may get so **low** that it **causes** serious **complications**.

Q.4 Write a note on pneumonia. (A.B) **(Understanding the Concept Q.3) (LHR 2015, 2016)**

OR

What is pneumonia? Describe its symptoms and causes **(LHR 2016)**

Ans: **PNEUMONIA**

Definition:

"Pneumonia is an **infection** of **lungs**".

Double Pneumonia:

If this **infection** affects **both lungs**, it is called **double pneumonia**.

Common Cause:

The most common cause of pneumonia is a **bacterium, Streptococcus pneumoniae.**

Other Causes:

- **Viral infections** (influenza virus)
- **Fungal infections**

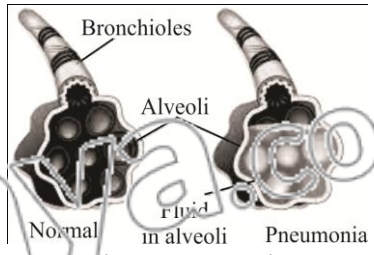


Figure: Pneumonia

Mode of Action:

When the **causative organisms** enter the **alveoli**, they **settle there** and **grow** in number. They **break** the **lung tissues** and the area becomes **filled** with **fluid and pus**.

Symptoms: **(GRW 2013)**

The symptoms of pneumonia include:

- **Cold**
- **High fever**
- **Shivering**
- **Cough**
- **Sputum production**
- **Shortness of breath**

Skin Colour:
The patient's **skin colour** may **change** and become **dusky or purplish**. It is due to **poor oxygenation of blood.**

Vaccination:
Vaccines are available to **prevent pneumonia** caused by S. pneumoniae.

Treatment:
Antibiotics are used in the **treatment** of this type of **pneumonia**.

Fatal Disease:
Prior to the **discovery** of **antibiotics**, **one-third** of pneumonia patients **died** from the infection.

Q.5 Write a note on asthma. (A.B) **(GRW 2015)**

Ans:

ASTHMA

Introduction:
"Asthma is a form of **allergy**".

Causes:
- **Inflammation of the bronchi**
- **More mucous production**
- **Narrowing of the airways**

Sensitivity to Allergens:
In asthma patients, the **bronchi** and bronchioles become **sensitive** to different **allergens**. When **exposed** to any of such **allergens**, the sensitive **airways** show **immediate** and **excessive response of constriction**. In this condition, the patient feels **difficulty** in **breathing**.

Allergens:
The **agents** that **cause allergy** are called allergens.

Examples:
- **Dust**
- **Smoke**
- **Perfumes**
- **Pollens**

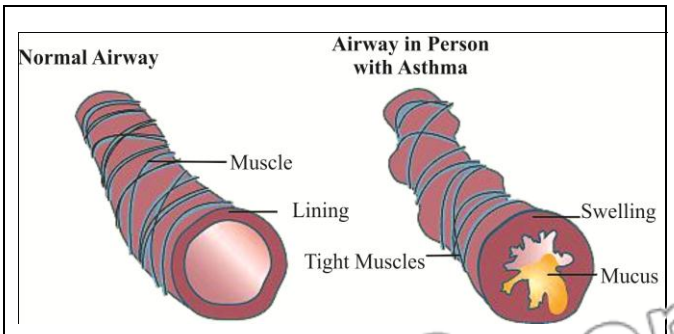


Figure: Asthma

Symptoms:
The **symptoms** of asthma **vary** from **person to person**. The major symptoms include:
- **Shortness of breath** (especially with exertion or at night)
- **Wheezing** (whistling sound when breathing out)
- **Cough**
- **Chest tightness**

Treatment:
The **chemicals** with **ability** to **dilate the bronchi** and bronchioles are used in the **treatment** of asthma. Such medicine is given in the form of **inhalers**.

Q.6 Write a note on lung cancer. (A.B) **(LHR 2014, MTN 2015)**

Ans:

LUNG CANCER

Introduction:

"**Lung cancer** is a **disease** of **uncontrolled cell divisions** in the **tissues** of the **lung**. The cells continue to **divide without** any **control** and form **tumours**".

Incidence:

Lung cancer is the most **common** cause of **cancer - related deaths** and is responsible for more than **1.3 million deaths worldwide** annually.

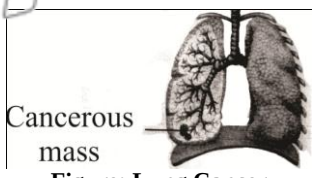


Figure: Lung Cancer

Malignant Tumours:

The cellular growth may also **invade adjacent tissues** beyond the lungs.

Symptoms:

The most common **symptoms** are:

- **Shortness of breath**
- **Coughing** (including coughing up blood)
- **Weight loss**

Major Cause:

Smoking is the **main cause** of lung cancer. This risk of lung cancer is significantly **lower in nonsmokers**. **Cigarette** smoke contains **over 50** known **carcinogens**.

Other Causes:

The main **causes** include:

- **Carcinogens**
- **Ionizing radiation**
- **Viral infection**

Passive Smoking:

"The **inhalation** of **smoke** from **another's smoking** is called **passive smoking**".

It is also a **cause** of **lung cancer**. The **smoke** from the **burning end** of a cigarette is more **dangerous** than the **smoke** from the **filter end**.

Prevention:

Eliminating tobacco smoking is a primary **goal** in the prevention of lung cancer.

Role of WHO:

The World Health Organization has **called** for **governments** to **stop tobacco advertising** to prevent young people from taking **up smoking**.

10.3 SHORT QUESTIONS

Q.1 What is bronchitis? (K.B) **(LHR 2016)**

OR

What are the major types of bronchitis?

Ans: Page no 14.

Q.2 Differentiate between acute bronchitis and chronic bronchitis.(K.B) **(LHR 2017)**

Ans:

DIFFERENTIATION

The difference between acute bronchitis and chronic bronchitis is as follows:

Acute Bronchitis	Chronic Bronchitis
• The "acute bronchitis" usually lasts about two weeks and patients recover with no permanent damage to the bronchi or bronchioles.	• In "chronic bronchitis" the bronchi developed chronic inflammation. It usually lasts for three months to two years.

Q.3 Write symptoms of bronchitis. (U.B) **(GRW 2017, DGK 2015, SWL 2015)**

Ans: Page no 14.

Q.4 What are the causes of bronchitis? (A.B) **(DGK 2015)**

Ans: Page no 18.

Q.5 Differentiate between asthma and emphysema. (K.B) **(GRW 2016)**

Ans:

DIFFERENTIATION

The differences between asthma and emphysema are as follows.

Asthma	Emphysema
Definition	
• "Asthma is a form of allergy".	• "Emphysema is the destruction of the walls of the alveoli".
Causes	
• Inflammation of the bronchi • More mucous production • Narrowing of the airways	• Smoking • Severe air pollution • Other chemical irritants

Q.6 Define emphysema. (K.B)

OR

What are symptoms of emphysema? (U.B) **(SWL 2014)**

Ans: Page no 14.

Q.7 What are the causes of pneumonia? (A.B)

Ans: Page no 15.

Q.8 How pneumonia develops? (A.B)

Ans: Page no 15.

Q.9 What are symptoms of pneumonia? (U.B)

Ans: Page no 16.

Q.10 What is the treatment of pneumonia? (A.B)

Ans: Page no 16.

Q.11 Define asthma. (K.B) **(LHR 2015)**

OR

Write symptoms of asthma. (U.B) **(LHR 2015, 2016, GRW 2016)**

Ans: Page no 16.

Q.12 How asthma develops? (A.B)

Ans: Page no 16.

Q.13 What is the treatment of asthma? (A.B)

Ans: Page no 16.

Q.14 What is meant by lungs cancer? (K.B)

OR

What are the symptoms of lungs cancer? (U.B) **(GRW 2016)**

Ans: Page no 17.

Q.15 What are the main causes of lung cancer? (A.B)

Ans: Page no 17.

10.3 MULTIPLE CHOICE QUESTIONS

1. A disease which is not caused by Bacteria : (U.B)
(A) Pneumonia (B) Bronchitis
(C) Emphysema (D) Tuberculosis

2. The inflammation of bronchi or bronchioles is called: (K.B) **(LHR 2013)**
(A) Bronchitis (B) Emphysema
(C) Pneumonia (D) Asthma

3. Causes of bronchitis: (A.B)
(A) Viruses (B) Bacteria
(C) Chemical irritants (D) All of these

4. The destruction of the walls of alveoli: (K.B)
(A) Asthma (B) Pneumonia
(C) Emphysema (D) Bronchitis

5. By the time, the symptoms of emphysema appear what percentage of lung tissue damage has happened? (A.B)
(A) 40% - 60% (B) 50% - 70%
(C) 60% - 80% (D) 50% - 80%

6. In which of the following disease the alveoli are filled with pus? (K.B)
(A) Bronchitis (B) Asthma
(C) Pneumonia (D) Emphysema

7. In which disease, the patient's skin colour may become dusky or purplish? (K.B)
(A) Lung cancer (B) Pneumonia
(C) Emphysema (D) Bronchitis

8. The decrease in surface area of lungs is observed in : (U.B)
(A) Pneumonia (B) Emphysema
(C) Bronchitis (D) Asthma

9. Main causes of any cancer include: (A.B)
(A) Carcinogens (B) Ionizing radiations
(C) Viral infections (D) All of these

10. How many carcinogens are present in cigarette smoke? (K.B) **(MTN 2015)**
(A) Over 50 (B) At least 50
(C) Less than 50 (D) Both a and b

11. Which one was used as insecticide in the past? (A.B)
(A) Caffeine (B) Ephedrine
(C) Marijuana (D) Nicotine

12. Increase the tooth loss in smokers: (K.B)
(A) 1 - 2 times (B) 2 - 3 times
(C) 3 - 4 times (D) 4 - 5 times

13. Increase the risk of tuberculosis in smokers: (K.B)

(A) 2 - 4 times (B) 3 - 5 times

(C) 4 - 6 times (D) 5 - 7 times

14. Increase the risk of pneumonia in smokers: (K.B)

(A) 2 times (B) 3 times

(C) 4 times (D) 5 times

15. Increase the risk of heart diseases in passive smokers: (K.B)

(A) 20 - 30% (B) 25% - 30%

(C) 25% - 40% (D) 30% - 40%

16. Increase the risk of lung cancer in passive smokers: (K.B)

(A) 10 - 20% (B) 15% - 25%

(C) 20% - 30% (D) 25% - 35%

17. Cancer of which organ can be caused by smoking: (U.B)

(A) Oral cavity (B) Larynx

(C) Lung (D) All of these

18. Which gas reduces the oxygen carrying capacity of haemoglobin? (U.B)

(A) Carbon dioxide (B) Carbon monoxide

(C) Nitrogen (D) Ammonia

19. Due to smoking, production of which blood cells increase? (K.B)

(A) Erythrocytes (B) Leucocytes

(C) Blood Platelets (D) None of these

20. The trachea and the bronchi are also lined with: (K.B)

(A) Ciliated cells (B) Mucous cells

(C) Glandular (D) Both A and C

21. Which one is the form of allergy in respiratory disorders? (K.B)

(A) Asthma (B) Bronchitis

(C) Pneumonia (D) Lung Caner

22. According to the WHO, the rates of smoking have declined in the developed world. In the developing world, however, it is rising by: (A.B)

(A) 3.4% (B) 3.5%

(C) 5.6% (D) None

23. Lung cancer is the most common cause of cancer-related death and is responsible for more than _____ million deaths worldwide annually. (K.B)

(A) 1.6 (B) 1.3

(C) 1.7 (D) 2

24. The majority of people diagnosed with chronic bronchitis are _____. (K.B)

(A) 40 Years or older (B) 50 Year or older

(C) 45 Years or older (D) Less than 50 Years

10.3.2 BAD EFFECTS OF SMOKING

LONG QUESTION

Q.1 Describe bad effects of smoking. (A.B) **(BWP 2014)**

Ans:

BAD EFFECTS OF SMOKING

Smoking is **harmful** due to the **chemicals** in **cigarettes** and **smoke**.

Chemical Composition of Tobacco Smoke:

Tobacco smoke contains **over 4,000 different** chemicals, out of which **at least 50** are **carcinogens** and many are **poisonous**.

Miss Concept about Smoking:

Many people think that **lung cancer** is the only **smoking related disease** and it is the **number one cause** of **death** among **smokers**. But it is **not right**. **Cigarette smoke affects** the **body** from **head to toe. Smokers** have a **much higher** risk of developing a number of **life threatening diseases**.

Smoking may also lead to the cancer in:

- **Kidneys**
- **Oral cavity**
- **Larynx**
- **Breast**
- **Bladder**
- **Pancreas**

Effects on Respiratory System:

Many **chemicals** in **tobacco smoke damage** the air **passageway**, which leads to **emphysema** and other **respiratory disorders**.

Effects on Circulatory System:

Smoking also has **effects** on the **circulatory system**. The following are the **side effects** of **smoking** on circulatory system.

- The **carbon monoxide** present in **tobacco smoke lessens** the **oxygen-carrying capacity** of **haemoglobin**.
- Many other **chemicals** in **smoke** increase the **production of blood platelets**. When **platelets** are **more than the normal numbers**, they make the **blood viscous** and it can **lead to arteriosclerosis**.

Other Disorders Related to Lungs:

Smokers are at **greater risk** of developing **infections**, particularly in the **lungs**. For examples:

- **Smoking** increases the **risk of tuberculosis** by two **to four times**.
- **Pneumonia by four times**.

Effects on Teeth: **(BWL 2014)**

Smoking is also responsible for **weakening** and **staining** the teeth. Tooth loss is **2 to 3 times higher in smokers** than in **non-smokers**.

10.3.2 SHORT QUESTIONS

Q.1 How nicotine is dangerous to human body? (A.B)

Ans:

NICOTINE

Nicotine is a powerful poison and was widely used as an insecticide in the past. When inhaled through tobacco smoking. It reaches our circulatory system and not only hardens the walls of the arteries but also damages the brain tissues.

Q.2 Describe social effects of smoking. (A.B)

Ans:

SOCIAL EFFECTS OF SMOKING

Smoking also affects the social life of a person. Smokers may face social un-acceptance because other people may not want to be exposed to other's smoke.

Q.3 What are effects of smoking on circulatory system? (A.B) **(LHR 2016, GRW 2016)**

Ans: Page no 21.

Q.4 Why does blood become thick due to smoking? (A.B)

Ans: Page no 21.

Q.5 Write two risks of passive smokers. (U.B)

Ans:

PASSIVE SMOKERS

Non-smokers who are exposed to second-hand smoke (passive smoke) at home or work increase their heart diseases risk by 20-30% and their lung cancer risk by 20-30%.

Q.6 Write the chemical composition of cigarette smoke. (K.B)

Ans: Page no 21.

Q.7 If a person stop smoking can contaminant particles will remove from lungs or not? (U.B)

Ans:

CONTAMINATED PARTICLES

If a person stop smoking, the chance to develop cancer decreases as damage to the lungs is repaired and contaminant particles are gradually removed.

10.3.2 MULTIPLE CHOICE QUESTIONS

1. Total chemicals in tobacco smoke are: (K.B)

(A) 1000 (B) 2000
(C) 3000 (D) 4000

2. Every year world no tobacco day is celebrated on: (K.B)

(A) 31 March (B) 31 May
(C) 21 March (D) 30 May

3. How many carcinogens are present in cigarette smoke? (K.B)

(A) 30 (B) 40
(C) 50 (D) 60

4. Many chemicals in smoke increase the production of which type of blood cells? (K.B)

(A) Platelets (B) Lymphocytes
(C) Red blood cells (D) Monocytes

5. Smoking increases the risk of tuberculosis by: (K.B)

(A) Two times (B) Four times
(C) Two to four times (D) Four to eight times

ANSWER KEY

MULTIPLE CHOICE QUESTIONS

10.1 GASEOUS EXCHNAGE IN PLANTS

1	D	2	A	3	D	4	A	5	B	6	D
7	D	8	B	9	B	10	B	11	D	12	C
13	A	14	C	15	C						

10.2 GASEOUS EXCHANGE IN HUMANS

1	B	2	D	3	B	4	B	5	D	6	B
7	D	8	C	9	A	10	C	11	A	12	A
13	B	14	B	15	B	16	B	17	A	18	C
19	B	20	A	21	B	22	C	23	C	24	C
25	B	26	C	27	C	28	A	29	D		

10.2.3 THE MECHANISM OF BREATHING

1	B	2	A	3	A	4	C	5	C	6	B	7	C
8	B	9	D	10	D	11	B	12	B	13	C	14	C
15	C												

10.3 RESPIRATORY DISORDERS

1	C	2	A	3	D	4	C	5	B	6	C
7	B	8	B	9	D	10	A	11	D	12	B
13	A	14	C	15	B	16	C	17	D	18	B
19	C	20	D	21	A	22	A	23	B	24	C

10.3.2 BAD EFFECTS OF SMOKING

1	D	2	B	3	C	4	A	5	C

REVIEW QUESTIONS

MULTIPLE CHOICE QUESTIONS

1. The process of gaseous exchange involves: (U.B)
(a) Breakdown of C-H bonds to yield energy.
(b) Physical movements that take air in and out of body.
(c) Getting oxygen from the air and removing carbon dioxide.
(d) Transport of oxygen by the blood to different parts of the body.

2. Most of the gaseous exchange in a leaf occurs through: (K.B)
(a) Stomata (b) General surface
(c) Cuticle (d) Lenticels

3. How many bronchi are there in the air passageway? (K.B)
(a) One (b) Two
(c) Many (d) None

4. Where does the gaseous exchange occur in humans? (K.B)
(a) Pharynx (b) Trachea
(c) Bronchi (d) Alveoli

5. Which structure actively helps in taking the air out of lungs? (K.B)
(a) Nasal cavity (b) Bronchus
(c) Bronchiole (d) Diaphragm

6. The primary chemical stimulus for breathing is the concentration of: (U.B)
(a) Carbon dioxide in blood (b) Oxygen in blood
(c) Carbon dioxide in muscles (d) Oxygen in muscles

7. Point out the FALSE statement about respiration: (U.B)
(a) Gases can easily pass through the walls of the alveoli
(b) Gas exchange in lungs is very efficient because lungs provide large surface area
(c) In emphysema the walls of alveoli break and there is more surface area
(d) Dust particles can damage the lung by irritating the inner alveoli surface.

8. A disease involving the breakdown of air sacs of the lungs is: (K.B)
(a) Pneumonia (b) Bronchitis
(c) Asthma (d) Emphysema

9. Which process does not occur in the nasal cavity? (U.B)
(a) Trapping of large dust particles (b) Humidification of the inhaled air
(c) Warming of the inhaled air (d) Exchange of gases

10. What type of blood vessels surrounds the alveoli? (K.B)
(a) Artery (b) Arteriole
(c) Capillary (d) Vein

ANSWER'S KEY

1	c	2	a	3	b	4	b	5	d
6	A	7	c	8	d	9	d	10	c

SHORT QUESTIONS

1. Differentiate between breathing and cellular respiration. (K.B)

Ans: **DIFFERENTIATION**

The differences between breathing and cellular respiration are as follows:

Breathing	Cellular Respiration
• The process through which animals take air in their bodies to get oxygen from it and then give out the air for getting rid of carbon dioxide is called breathing.	• The process in which the carbon-hydrogen bonds in the food are broken by oxidation reduction reactions and the energy is transformed into ATP is called cellular respiration.
• Breathing is only the mechanical or physical process for the exchange of gases.	• Respiration involves the mechanical and the biochemical processes.
• No energy is produced.	• Energy is produced in the form of ATP.
• It occurs at organ system level and respiratory system is involved	• It occurs at cell level.

2. Trace the path of air from the nasal cavity to the alveoli. (K.B)

Ans: **PATH OF AIR FROM THE NASAL CAVITY TO THE ALVEOLI**

External nostrils→ Nasal cavity → Internal nostrils →Pharynx → Larynx → Trachea →Bronchi → Bronchioles → Alveolar duct → Alveoli

3. How will you differentiate between a stoma and a lenticel? (K.B) **(GRW 2016)**

Ans: **DIFFERENTIATION**

The differences between stoma and lenticel are as follows:

Stoma	Lenticel
• Stomata are the small openings in the epidermis of leaves and young stems for gaseous exchange. • They are found in the epidermis of leaves and young stems.	• Small raised areas in the bark of stems and roots that enable gaseous exchange. • They are found in the layer of bark.

UNDERSTANDING THE CONCEPT

1. How do the different parts of the plant body exchange gases with the environment? (U.B)

Ans: See the LQ.1 of **(Topic 10.1)**

2. Write down the steps of inhalation and exhalation. (K.B)

Ans: See the LQ.1 of **(Topic 10.2.3)**

3. State the signs and symptoms, causes and treatments of bronchitis, emphysema and pneumonia. (A.B)

Ans: See the LQ.2, 3, 4 **(Topic 10.3)**

4. How does the tobacco smoke damage the respiratory system? (A.B)

Ans: **DAMAGE OF TOBACCO SMOKE TO RESPIRATORY SYSTEM**

Smoking is harmful due to the chemicals in cigarettes and smoke. Tobacco smoke contains over 4,000 different chemicals, out of which at least 50 are carcinogens and many are poisonous.

Misperception:

Many people think that lung cancer is the only smoking-related disease and it is the number one cause of death among smokers. But it is not right. Cigarette smoke affects the body from head to toe. Smokers have a much higher risk of developing a number of life threatening diseases.

Damage to Respiratory System:

Many chemicals in tobacco smoke damage the air passageway, which lead to emphysema and other respiratory disorders.

Lung Infections:

Smokers are at greater risk of developing infections, particularly in the lungs. For example, smoking increases the risk of tuberculosis by two to four times, and of pneumonia by four times.

Passive Smokers:

Non-smokers who are exposed to second hand smoke (passive smoke) at home or work increase their heart disease risk by 25-30% and their lung cancer risk by 20-30%.

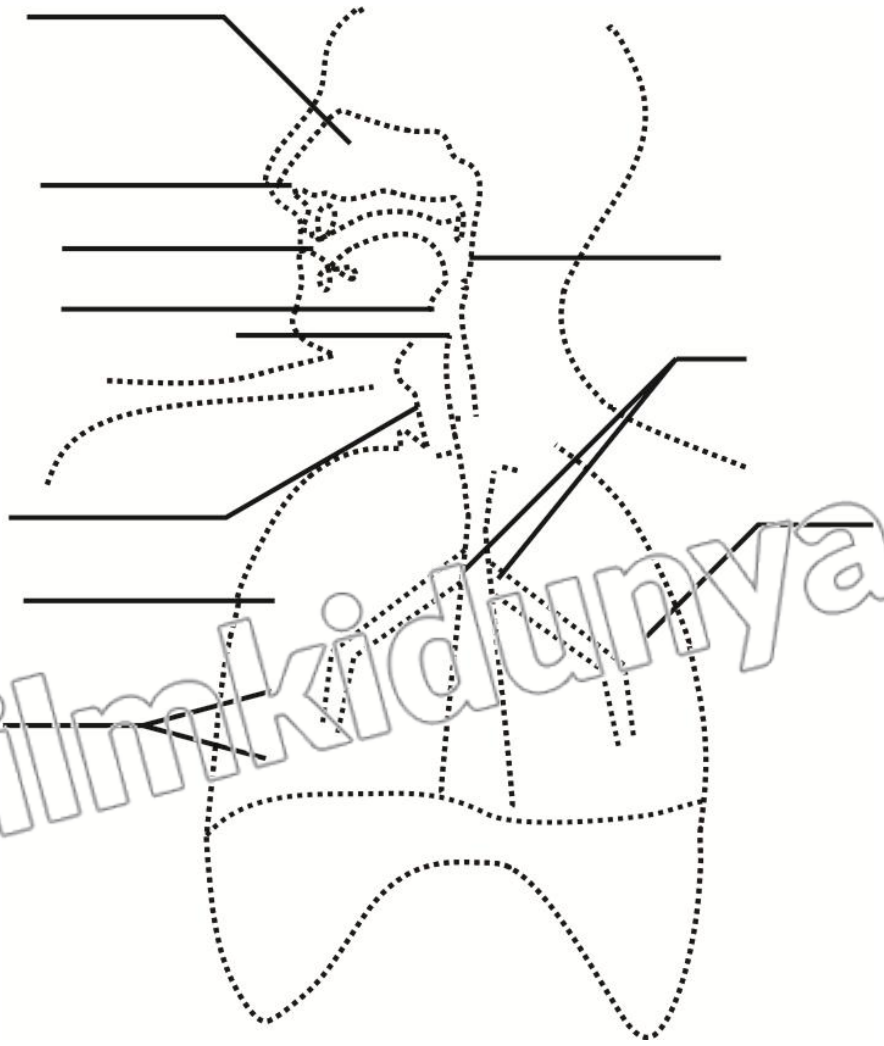
Effect of Smoking on Social Life:

Smoking affects the social life of a person. Smokers may face social unacceptance because other people may not want to be exposed to other's smoke.

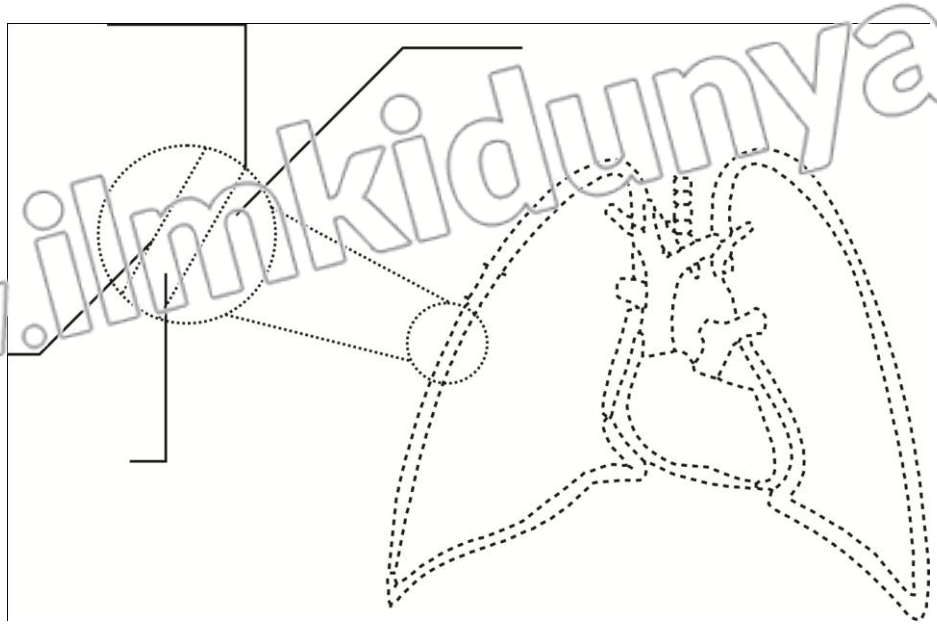
ASSIGNMENT

PRACTICE DIAGRAM & LABEL

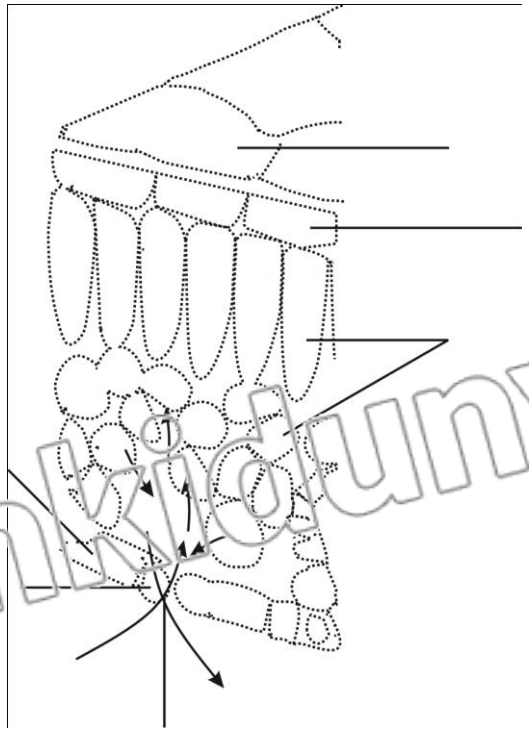
RESPIRATORY SYSTEM



LUNGS



GASEOUS EXCHANGE IN A LEAF



SELF TEST

Time: 40 min **Marks: 25**

Q.1 Four possible answers A, B, C and D to each question are given, mark the correct answer. (6×1=6)

1. In young stems and leaves, some gaseous exchange also occurs through _____ which is present over the epidermis. (K.B)

(A) Cortex **(B)** Endodermis
(C) Cuticle **(D)** Stomata

2. The aquatics plants get the ____ dissolved in water and release _____ in the water. (K.B)

(A) Nitrogen, carbon dioxide **(B)** Carbon monoxide, oxygen
(C) Oxygen, carbon dioxide **(D)** Hydrogen, oxygen

3. How many pairs of fibrous bands are present in larynx? (K.B)

(A) 1 **(B)** 2
(C) 3 **(D)** 4

4. Which one was used as insecticide in the past? (A.B)

(A) Caffeine **(B)** Ephedrine
(C) Marijuana **(D)** Nicotine

5. A disease involving the breakdown of air sacs of the lungs is: (K.B)

(A) Pneumonia **(B)** Bronchitis
(C) Asthma **(D)** Emphysema

6. Which process does not occur in the nasal cavity? (U.B)

(A) Trapping of large dust particles **(B)** Humidification of the inhaled air
(C) Warming of the inhaled air **(D)** Exchange of gases

Q.2 Give short answers to following questions. (5×2=10)

(i) How gaseous exchange occurs in young stems and leaves? **(U.B)**

(ii) Difference between breathing and respiration. **(K.B)**

(iii) What is the role of glandular cells of trachea ad bronchi? **(A.B)**

(iv) What is the prevention and treatment of pneumonia? **(A.B)**

(v) How nicotine is dangerous to human body? **(A.B)**

Q.3 Answer the following questions in detail. (5+4=9)

(a) Explain the mechanism of breathing. **(K.B)**

(b) Write a note on asthma. **(K.B)**

NOTE: Parents or guardians can conduct this test in their supervision in order to check the skill of students.