ICSE MODEL EXAMINATION

CLASS VI UNIT TEST PRACTICE PAPER — BIOLOGY

Subject: Science (Paper 3) | **Chapter: Respiratory System** | **Time: 1 Hour 30 Mins** | **Max Marks: 50 Marks**

SECTION A (20 MARKS) — ATTEMPT ALL QUESTIONS — COMPULSORY

Q1. Fill in the blanks with suitable words: **[5 × 1 = 5]**

i. The inner lining of the trachea consists of _____ epithelium.

ii. The breakdown of glucose to release energy utilizing oxygen is called _____ respiration.

iii. The _____ flap guards and closes the windpipe at the time of swallowing food.

iv. The volume of the chest cavity _____ during the process of inspiration.

v. The percentage of _____ gas remains unchanged (approx 79%) in both inspired and expired air.

Q2. Match the terms in Column A with their appropriate descriptions in Column B: **[5 × 1 = 5]**

- (i) Aerobic Respiration

Column A	Column B
(a) Two-lobed lung accommodated near heart	
(ii) Trachea	(b) Requires presence of oxygen gas
(iii) Left Lung	(c) Occurs in complete absence of oxygen
(iv) Anaerobic Respiration	(d) Three-lobed organ resting on diaphragm
(v) Right Lung	(e) Supported by C-shaped cartilaginous rings

Q3. State whether True or False. If False, rewrite the corrected statement: **[5 × 1 = 5]**

i. The right lung is slightly smaller and divided into two lobes to accommodate the heart.

ii. Cellular respiration is a physical process that occurs only inside the lungs.

iii. The epiglottis guards the entrance of the gullet during the swallowing of food.

iv. The walls of the trachea are strengthened by C-shaped cartilaginous rings to prevent collapsing.

v. Oxygen diffuses out from the blood capillaries into the alveoli during gaseous exchange.

Q4. Assertion & Reason Questions: Choose from options (1) to (4): **[5 × 1 = 5]**

Codes: (1) Both A & R are true, R is correct explanation. (2) Both A & R are true, R is NOT correct explanation. (3) A is true, R is false. (4) A is false, R is true.

i. **Assertion (A):** Front opening of the windpipe is guarded by a muscular flap called epiglottis.
Reason (R): The trachea is supported by C-shaped cartilage rings keeping it open for air flow.

ii. **Assertion (A):** Energy produced during respiration is used by the body for internal & external activities.
Reason (R): No energy is used by the body during sleep because physical activities completely stop.

iii. **Assertion (A):** Alveoli are the primary functional units of lungs where exchange of gases takes place.
Reason (R): Thin walls of alveoli are richly supplied with capillaries allowing rapid gas diffusion.

iv. **Assertion (A):** Air rushes into the lungs during inhalation.
Reason (R): Pressure inside the lungs becomes lower than atmospheric pressure outside during

SECTION B (30 MARKS) SUBJECTIVE & APPLICATION QUESTIONS

Q5. Short Answer Questions: Answer briefly: **[5 × 2 = 10]**

1. Define **Respiration**. In which high-energy chemical form is energy stored inside living cells?
2. State two distinct functions of the hair and sticky mucous lining present inside the nasal chamber.
3. Differentiate between **Aerobic** and **Anaerobic respiration** based on oxygen requirement and energy yield.
4. Mention the primary cause and one characteristic symptom of the respiratory disease **Asthma**.
5. What is the function of the **pleural fluid** contained between the outer and inner pleura of lungs?

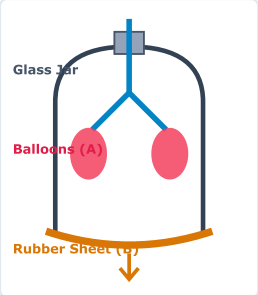
Q6. Short Notes: Write concise bulleted notes on ANY TWO: **[2 × 3 = 6]**

a. **Mechanism of Inhalation (Inspiration):** Describe movements of ribs, diaphragm, chest volume, and pressure changes.

b. **Tuberculosis (TB):** State its causative micro-organism, major clinical symptoms, and preventive vaccine.

c. **Structural Adaptation of Alveoli:** Explain how alveolar structure maximizes gaseous exchange efficiency.

Q7. Picture Study Question: Bell-Jar Model Experiment **[6 Marks]**



The diagram alongside represents a model setup used in a laboratory to demonstrate breathing mechanism:

i. Which organ of the human respiratory system is represented by:
   (a) The rubber balloons (A)?
   (b) The flexible rubber sheet (B)? *(2 M)*

ii. What observation is made in the balloons when the rubber sheet (B) is pulled downwards? Name the phase of breathing demonstrated. *(2 M)*

iii. What happens when the rubber sheet is released back up? Name the corresponding phase of breathing. *(2 M)*

Q8. Long Answer / Structured Questions: **[2 × 4 = 8]**

1. **(a)** Differentiate between **Breathing** and **Respiration** based on process type, site of occurrence, and energy release. *(3 M)*
   (b) Why is it strongly recommended to breathe through the nose rather than the mouth? *(1 M)*
2. **(a)** What is the Voice Box or Larynx? Why does continuous coughing occur if food particles wrongly enter the trachea? *(2 M)*
   (b) Tabulate the percentage composition of **Oxygen** and **Carbon Dioxide** in inspired vs expired air. *(2 M)*

EVALUATION KEY & MODEL ANSWERS (FOR TEACHERS & SELF-ASSESSMENT)

Q1. Fill in the Blanks:
(i) Ciliated | (ii) Aerobic | (iii) Epiglottis | (iv) Increases | (v) Nitrogen

Q2. Match the Columns:
(i) → (b) Requires presence of oxygen | (ii) → (e) C-shaped cartilaginous rings | (iii) → (a) Two-lobed lung accommodated near heart | (iv) → (c) Occurs in complete absence of oxygen | (v) → (d) Three-lobed organ resting on diaphragm

Q3. True or False with Corrections:
1. **False.** Correct: The *left lung* is slightly smaller with two lobes to accommodate the heart (right lung has 3 lobes).
2. **False.** Correct: Cellular respiration is a *biochemical process* occurring in *all living cells*.
3. **False.** Correct: Epiglottis guards the entrance of the *windpipe (trachea)* during swallowing.
4. **True.**
5. **False.** Correct: Oxygen diffuses from the *alveoli into the blood capillaries* during gaseous exchange.

Q4. Assertion & Reason Answers:
(i) **(2)** Both A & R are true, but R is not the correct explanation of A.
(ii) **(3)** A is true, but R is false (body uses energy continuously even during sleep for vital functions).
(iii) **(1)** Both A & R are true, and R is the correct explanation of A.
(iv) **(1)** Both A & R are true, and R is the correct explanation of A.
(v) **(1)** Both A & R are true, and R is the correct explanation of A.

Q5. Short Answer Key:
1. **Respiration:** Biochemical process of breaking down food (glucose) to release energy. Stored as **ATP (Adenosine Triphosphate)**.
2. **Nasal Lining:** Hair filters out dust/foreign particles; sticky mucous traps germs/dirt and moistens incoming air.
3. **Aerobic vs Anaerobic:** Aerobic uses oxygen and yields high energy (38 ATP). Anaerobic occurs without oxygen and yields low energy (2 ATP).
4. **Asthma:** Caused by air pollutants/allergens causing inflammation of air passages. Symptom: Wheezing/shortness of breath.
5. **Pleural Fluid:** Acts as a shock absorber and reduces friction on lung surfaces during chest expansion/contraction.

Q6. Short Notes Key:
• **Inhalation:** Ribs move upwards & outwards; diaphragm contracts and flattens down. Chest cavity volume increases, reducing air pressure; atmospheric air rushes into lungs.
• **Tuberculosis (TB):** Bacterial infection (*Mycobacterium tuberculosis*). Symptoms: Persistent cough, chest pain, fever, weight loss. Vaccine: **BCG vaccine**.
• **Alveoli Adaptation:** Thin 1-cell thick walls, millions in count providing huge surface area, richly surrounded by blood capillaries for fast diffusion.

Q7. Picture Study Key:
(i) (a) Balloons = Lungs; (b) Rubber sheet = Diaphragm.
(ii) When sheet is pulled down, volume inside jar increases, pressure drops, air enters and **balloons inflate**. Represents **Inhalation (Inspiration)**.
(iii) When sheet is released, volume decreases, pressure rises, air leaves and **balloons deflate**. Represents **Exhalation (Expiration)**.

Q8. Long Answer Key:
1. (a) *Breathing* is a physical process, occurs in lungs, no energy released. *Respiration* is a biochemical process, occurs inside cells, releases energy (ATP).
(b) Breathing through nose warms, moistens, and filters air via hair and mucous before reaching delicate lungs.