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Answer the ff. briefly:

1)Complete the following table that summarizes the structure and function of the respiratory system in different kinds of animals. **(16 pts.)**

Organism	**Name of respiratory surface**	**Description of process by which gas exchange occurs**
Insect	Tracheal Systems	The tracheal system, the most direct and effective breathing system in active animals, is made up of tubes composed of chitin, a polymeric substance. Spiracles cover half of the thorax and abdomen of insects. These apertures connect to the tubular network, allowing oxygen to enter the body and regulating CO2 and water vapor diffusion. The spiracles enable air to enter and exit the tracheal system. Some insects can ventilate the tracheal system by moving their bodies.
Fish	Gills	Fish inhale oxygen-rich water through their mouths and expel it via their gills. When water flows over the gill filaments, the dissolved oxygen is taken up by the

		blood within the capillary network. The circulatory system then transports oxygen to all tissues of the body and, lastly, to the cells while absorbing carbon dioxide expelled from the body via the gills.
Frog	Skin	All of the frog's respiration occurs through the skin while entirely immersed. The skin is made up of thin membranous tissue that is water permeable and has a dense network of blood vessels. The thin membrane permits breathing gases to pass directly down gradients between blood vessels and the surrounding environment. When the frog is not in the water, mucus glands in the skin keep it moist, which aids in the absorption of dissolved oxygen from the air.
Mammal	Alveoli	In mammals, the nasal cavity warms and humidifies the air. The air then passes through the pharynx and larynx, the trachea, and into the lungs. Air enters the lungs via the branching bronchi and travels to the respiratory bronchioles.

2) Give 3 reasons why respiratory surfaces make diffusion and gas exchange effective.

- Large surface area for gaseous exchange and numerous alveoli are present in the lungs with a form that increases surface area and rate of diffusion.
- Moist surfaces dissolve gases in moisture, allowing them to travel through the gas exchange surface for better gas diffusion.
- A significant diffusion gradient breathing assures that the oxygen concentration in the alveoli is greater than the oxygen concentration in the capillaries, allowing oxygen to flow from the alveoli to the blood. Carbon dioxide diffuses the opposite way.

3) Some animals such as the fish and mammals have special organs with large surface area. Give reasons why they cannot exchange gases through their body surface.

- Diffusion through the outer surface of large animals is insufficient to maintain gas exchange. They created a variety of respiratory surfaces, all of which increase the surface area for exchange, allowing for larger bodies.

4) Why do amphibians use their skin also for gas exchange rather than their lungs alone?

- The amphibians' thin membranous skin allows breathing gases to flow straight down gradients between blood vessels and the surroundings. When amphibians are not in the water, mucus glands in their skin keep them moist, which aids in the absorption of dissolved oxygen from the air.

5) Briefly describe how amoeba and other unicellular organisms respire.

- Amoeba respiration occurs through its cell membrane, also known as the plasma membrane. Diffusion allows the amoeba to obtain oxygen gas dissolved in surrounding water via its plasma membrane. Amoeba consumes the oxygen gas that has dispersed throughout the body. The ingested oxygen gas is employed in the body to break down complex dietary stuff into simple molecules. The oxygen gas in the amoeba's body is transformed into carbon dioxide gas throughout these metabolic activities. Carbon dioxide gas is also liberated in the surrounding water via the same diffusion process.

6) State two ways in which an earthworm keeps its body moistened.

- The earthworm's skin contains glands that secrete mucus, which keeps its body moistened. This mucus supports respiration by keeping the earthworm moist. The earthworm breathes through its skin, which is thoroughly thin. Oxygen dissolves in the earthworm's bodily fluids and subsequently enters the body.
- Earthworms are frequently seen above ground when it rains or at night when the air is wetter. The remainder of the time, damp soil allows earthworms to live underneath the earth and get the oxygen they need to exist. However, they generally avoid wet soil, preferring moist soil.

7) It is important for respiratory surfaces to be kept moist always. How does this help with absorption of gases?

- Thin, moist epithelial cells cover the respiratory surface, allowing oxygen and carbon dioxide to exchange. Since these gases may only cross cell membranes when dissolved in water or an aqueous solution, respiratory surfaces must be moist for the gases to dissolve and diffuse through cell membranes.

8) Briefly explain how gas exchange takes place in the following parts of plants.

A. Roots: A plant's roots absorb air from the gaps between soil particles. In the soil particles, root hairs come into contact with air. Oxygen from the air in soil particles diffuses into root hair and reaches all of the root's cells, where it is used for respiration.
B. Stem: Non Suberized pores called lenticels perforate the stems. These allow oxygen to enter the intercellular spaces of the inner tissues and carbon dioxide to be released into the atmosphere. Many annual plants have green stems that are almost as essential for photosynthesis as the leaves. For gas exchange, these stems rely on stomata rather than lenticels.
C. Leaves: Stomata, or microscopic pores, are found in leaves. Gaseous exchange happens by diffusion through the stomata. Each stoma is regulated by guard cells. The closure and opening of the stoma between the base leaflets and the atmosphere results in gas exchange.