Breathing – answers

1 (a) Energy is obtained from food by a process called *respiration* (A).
(b) The intake of oxygen and output of carbon dioxide at a respiratory surface is called *gaseous exchange* (B).
(c) The process of renewing air in the lungs is called *ventilation* (C).
(d) The processes B and C are included in the term 'breathing'.

2 From the nasal cavity the air would pass through the (pharynx, glottis), larynx, trachea, bronchi and bronchioles to reach the alveolus.

3 The cartilage rings hold the air passages open.

4 The lining of the air passages produces *mucus* which traps dust particles. *Cilia* in the lining flick to and fro to carry the mucus up and out of the passages.

5 (b) When we inhale our diaphragm muscles contract and the ribs move up.

6 Blood in the pulmonary artery will contain less oxygen and more carbon dioxide than blood in the pulmonary vein.

7 Breathing becomes deeper and more rapid, thus exposing the capillaries to a greater volume of air in a given time.

8 Exhaled air contains approximately 16% oxygen.

9 (i) vital capacity: 5000 cm^3, (ii) tidal Volume: 500 cm^3, (iii) residual air: 1000 cm^3.

10 Four characteristics of an efficient respiratory surface are: thin epithelium, large surface area, abundant capillaries, ventilation mechanism.

11 *Diffusion* is the process by which oxygen passes from the alveoli to the lung capillaries.

12 (b)Tuberculosis and (d) colds are unlikely to be caused by smoking (but it doesn't help).