2.9 Lymphatic Tissue

374. a – b + c + d + e -
Lymphatic nodules (not to be confused with lymph nodes) are found in tonsils, lymph nodes and the spleen.

375. a + b - c – d - e -

376. a + b + c + d + e +
Lymph is filtered by the lymph nodes, through which the lymphatic vessels pass. The lymph nodes have an outer cortex and inner medulla. Afferent lymphatic vessel enters the node at various points in its convex edge and the efferent vessels leave the node via the hilus. The spleen is a blood filter. The tonsils and spleen as well as Peyer's Patches are producers of lymphocytes, but do not filter lymph, which is filtered only in lymph nodes.

377. a – b + c + d + e +
Tonsils are aggregations of lymphatic tissue situated under the epithelium of the mouth and pharynx. They are partly encapsulated (on the side which lacks epithelium) and usually show epithelial invaginations and crypts. The tonsils have distinct lymphatic nodules that produce lymphocytes that can migrate to sites of infection. Tonsils are regarded as the first barrier in the body to invading microorganisms at a major site of potential infecting.

378. a – b – c + d + e +

379. a + b – c – d + e +
The thymus has both a mesenchmal and an epithelial origin. The lymphocytes are derived from mesenchymal cells that invade an epithelial primordium that develops from the endodermal pharyngeal pouches. The thymus is a lobulated body that lacks lymphatic nodules. It contains epithelial reticular cells and Hassall's bodies. The thymus involutes rapidly after puberty and involution can also be caused by treatment with corticosteroid hormones.

380. a + b – c – d – e +

381. a + b + c + d – e -
The main cell types of the thymic medulla are lymphoblast, young lymphocytes and epithelial reticular cells. Hassall's bodies are also found in the medulla.

382. a – b – c + d – e -
Type T lymphocytes are involved in the cell-mediated immune response and develop into cyto-toxic ('killer') cells, which attack foreign cells or bodies that have invaded the body. The T – lymphocytes arise from stem cells in the bone marrow, but only reach maturity in the thymus. T lymphocytes can be converted into lymphoblasts that can divide.

383. a + b – c – d + e +
The thymus has a cortex and medulla evident in each lobule. Lymph nodes and kidneys are other structures with a cortex and medulla.

384. a + b + c + d + e +

385. a – b + c + d + e +
The spleen has the largest accumulation of lymphatic tissue in the body and is the largest lymphatic organ in the circulatory system. It serves as a reservoir for blood and also acts as a blood filter to detect and deal with foreign bodies. Functions of the spleen include defense by both B and T lymphocytes, the production of lymphocytes and monocytes as well as the destruction of aged erythrocytes.

386. a + b + c + d – e +
The spleen is surrounded by a dense connective tissue capsule from which trabeculae arise that divide the splenic pulp into incomplete compartments. These trabeculae contain both nerves and arteries. Smooth muscle fibers may be found in the connective tissue of the capsule, though these are not as prominent in humans as in other mammals such as cats. The spleen is the site of Billroth cords.

387. a + b + c + d + e +
The white pulp of the spleen has both lymphatic nodules and diffuse lymphatic tissue. Central arteries (arterioles) pass through the lymphatic nodules and are easily seen in histological preparations. The white pulp also has reticular cells and fibers, which form a 3-dimensional mesh occupied by macrophages and developing lymphocytes.

388. a + b + c + d + e +
The red pulp of the spleen is the site of Bill Roth cords, reticular cells, monocytes and macrophages.

389. a + b + c + d + e +
The sinusoids of the spleen differ from typical capillaries in that they have irregular dilated lumina and gaps between on which the endothelial cells. The basal lamina on which the endothelial cells are found is also discontinuous.

390. a + b + c + d + e +
The venous sinusoids (sometimes referred to as sinuses) have wide irregular lumina, which vary in size according to the amount of blood in the spleen. The main filtration of foreign particulars or microorganisms occurs in the Billroth cords, where abundant macrophages are found. The venous sinusoids have only a very limited capacity to take up particular matter.

391. a – b + c – d – e -
The cell-mediated immune response is carried out by T lymphocytes. T memory cells are present in the circulating peripheral blood in the form of small lymphocytes, that in the event of foreign bodies being detected can be converted into T lymphocyte cytotoxic ('killer') cells.

392. a – b – c + d + e +
Lymphocytes respond to antigens in the tonsils, lymph nodes and spleen. The presence of antigens triggers the formation of new lymphocytes in the lymphatic nodules.

393. a + b + c + d – e -
Stem cells from which lymphocytes develop in embryos may be found in the yolk sac, liver and bone marrow.