Oral part of the final exam in Histology and Embryology – general medicine
(the list of specific learning goals corresponding to each topic can be downloaded from the website of the Department of Histology and Embryology, Faculty of Medicine in Pilsen, Charles University)

CYTOLOGY AND BASIC HISTOLOGY

1. The cell. Cell cycle. Mitosis. Meiosis. Organelles.
2. Basal membrane. Apical cell surface and its modifications.
3. Cell junctions. Modifications of lateral cell surface.
4. Tissues – definition, classification.
5. Epithelia – morphological and functional classification, polarity.
6. Covering epithelia – classification and examples.
7. Glands. Secretion. Classification of glands and glandular ducts.
8. Serous and mucous secretion.
9. Glands of skin – structure, classification.
10. General structure and components of connective tissues. Cells of connective tissues.
11. Extracellular matrix of connective tissues.
12. Connective tissue proper – components and classification.
13. Cartilage – types of cartilage, their components.
14. Bone – components and classification. Types of bone.
15. Development of bone – intramembranous ossification and endochondral ossification.
16. Peripheral blood. Formed blood elements. Blood count.
17. Erythrocytes – structure, function, count.
18. Leukocytes – classification, structure, function. Differential white blood count.
19. Agranulocytes – morphology and function.
20. Granulocytes – morphology and function.
21. Blood platelets, morphology and function. Thrombopoiesis.
22. Hemopoiesis – ontogenesis and lineages. Erythropoiesis.
23. Granulopoiesis, lymphopoiesis, monopoiesis.
24. Muscle tissue – general characteristics and classification.
25. Smooth muscle.
26. Striated skeletal muscle.
27. Cardiac muscle. Cardiac conducting system.
28. General structure of the nervous tissue. Neuron. Types of neurons.
29. Types of synapses.
30. Neuroglia. Formation of myelin.

MICROSCOPIC ANATOMY

1. Tooth.
2. Mouth cavity. Tongue.
3. Esophagus, general structure of the gastrointestinal tube.
4. Stomach.
5. Small intestine. Large intestine, appendix.
6. Liver.
7. Gall bladder, pancreas.
8. The respiratory passages, larynx, trachea and bronchi.
9. Lungs. Alveolocapillary membrane.
10. Renal cortex and medulla. Nephron.
11. The urinary passages.
12. Testis and epididymis.

13. Male genital ducts. Prostate.
14. Ovary. Ovarian follicles.
15. Oviduct, vagina, labia majora and labia minora. Mammary gland.
16. Uterus. Menstrual cycle. Placenta. Umbilical cord.
17. Skin.
18. Brain. Cytoarchitecture of the brain cortex.
19. Cerebellum.
20. Spinal cord.
21. Peripheral nerve.
22. Eye – layers of the eyeball including retina. Lens.
23. The outer ear, the middle ear, and the inner ear. Olfactory epithelium.
24. Vessels – classification, structure and function.
25. Heart. Cardiac conducting system.
26. Thymus. Bone marrow.
27. Lymph nodes. Tonsils.
28. Hypophysis.
29. Thyroid gland.
30. Adrenal gland.

EMBRYOLOGY

1. Progenesis – spermiogenesis and oogenesis.
2. Fertilization, cleavage.
3. Development of the blastocyst, implantation. Abnormal implantation (ectopic pregnancy).
4. Gastrulation, germ layers, embryonic disc.
5. Notochord. Formation of axial structures of the embryo.
6. Development of fetal membranes and the placenta.
7. Amniotic sac expansion, formation of primitive gut.
8. Development of the neural tube. Neurulation. Brain vesicles. Neural crest.
9. Development of the eye.
10. Development of the outer ear, of the middle ear, and of the inner ear.
11. Development of blood vessels. Primitive embryonic and extraembryonic circulation.
12. Aortic arches.
13. Development of the heart, septation of heart atria.
14. Septation of cardiac ventricles. Heart malformations.
15. Development of the primitive gut. Yolk sac, yolk stalk. Stomodeum.
16. Development of the teeth.
17. Derivatives of pharyngeal arches, of ectodermal pharyngeal clefts and of endodermal pouches.
18. Development of the tongue.
19. Development of the thyroid gland and of the hypophysis.
20. Development of the respiratory system.
21. Development of foregut, development of stomach.
22. Development of the intestines including their rotation. Development of liver, pancreas and spleen.
23. Development of face.
24. Development of the skull.
25. Development of the definitive palate. Cleft malformations.
26. Development of the urinary system. Pronephros, mesonephros.
27. Metanephros. Development of the urinary excretory passages.

28. Cloaca. Mesonephric (Wolffian) and paramesonephric (Müllerian) duct and their derivatives in male and in female.
29. Development of the gonads. Development of the male and female external genital organs.
30. Development of the vertebrae, ribs, and limbs.