

## CYTOLOGY

1. What main components of the cell do you know?
  - A. Cytoplasm, organelles, inclusions.
  - B. Cytoplasm, cell membrane, nucleus.
  - C. Cell membrane, cytoplasm, organelles.
  - D. Nucleus, cytoplasm, organelles.
  - E. Cytoplasm, cell membrane, nucleolus.
2. What polar parts does the phospho-lipid molecule have?
  - A. Free, eliminated.
  - B. Hydrophilic, hydrophobic.
  - C. Integral, peripheral.
  - D. Pinocytosis, phagocytosis.
  - E. Endocytosis, exocytosis.
3. What is the function of peroxysome?
  - A. Intracellular digestion.
  - B. Detoxification.
  - C. Generation of energy.
  - D. Synthesis of proteins.
  - E. Synthesis of carbohydrates and lipids.
4. What is the function of smooth endoplasmic reticulum?
  - A. Intracellular digestion.
  - B. Intracellular transport.
  - C. Generation of energy.
  - D. Synthesis of proteins.
  - E. Synthesis of carbohydrates and lipids.
5. What does ribosome consist of?
  - A. Two membranes.
  - B. Two subunits.
  - C. Microfibriles.
  - D. Microtubules.
  - E. Single membrane.
6. For what organelle are characteristic cristae?
  - A. Lysosome.
  - B. Centriole.
  - C. Cytoskeleton.
  - D. Mitochondria.
  - E. Peroxisome.
7. How many granules does the nuclear pore complex have?
  - A.  $8 \times 3 + 0$ .
  - B.  $8 \times 3 + 1$ .
  - C.  $8 \times 3 + 2$ .
  - D.  $9 \times 3 + 0$ .
  - E.  $9 \times 3 + 2$ .
8. What surfaces of Golgi apparatus do you know?
  - A. Smooth, rough.
  - B. Trans, middle, cis.
  - C. Mitochondrial, nuclear.
  - D. Linear, digitiform .
  - E. Primary, secondary, residual body.
9. What main components does the nucleus have?
  - A. Pars granulosa, pars fibrosa, pars amorphous.
  - B. Double nuclear membrane, chromosome.
  - C. Nucleolus, organelles, chromatin.
  - D. Karyolemma, karyoplasma, chromatin, nucleolus.
  - E. Euchromatin, heterochromatin.
10. When the amount of the DNA in the cell does become duplicated (4c)?
  - A. S phase.
  - B. Prophase.
  - C. Metaphase.

- D. Anaphase.
- E. Telophase.

11. From what layers does plasmalemma consist of?

- A. Two layers of phospholipids.
- B. Cholesterols, two layers of phospholipids.
- C. Single phospholipid layer, glycocalyx, cortical layer.
- D. Glycocalyx, lipid bilayer, cortical layer.
- E. Glycolipids, lipid bilayer, cortical layer.

12. What type of the transport, which uptake of fluid and macromolecules into the cell do you know?

- A. Free, eliminated.
- B. Hydrophilic, hydrophobic.
- C. Integral, peripheral.
- D. Pinocytosis, phagocytosis.
- E. Endocytosis, exocytosis.

13. What is the function of lysosomes?

- A. Intracellular digestion.
- B. Detoxification.
- C. Generation of energy.
- D. Synthesis of proteins.
- E. Synthesis of carbohydrates and lipids.

14. What is the function of mitochondria?

- A. Intracellular digestion.
- B. Detoxification.
- C. Generation of energy.
- D. Synthesis of proteins.
- E. Synthesis of carbohydrates and lipids.

15. From what does the centriole consist of?

- A. Two membranes.
- B. Two subunits.
- C. Microfilaments.
- D. Microtubules.
- E. Single membrane.

16. Which organelles does the intermembranous space have?

- A. Endoplasmic reticulum.
- B. Centriole.
- C. Golgi apparatus.
- D. Mitochondria.
- E. Peroxisome.

17. How many microtubules does the centriole have?

- A.  $8 \times 3 + 0$ .
- B.  $8 \times 3 + 1$ .
- C.  $8 \times 3 + 2$ .
- D.  $9 \times 3 + 0$ .
- E.  $9 \times 3 + 2$ .

18. What types of endoplasmic reticulum do you know?

- A. Smooth, rough.
- B. Trans, cis.
- C. Mitochondrial, nuclear.
- D. Linear, digitiform .
- E. Primary, secondary.

19. What components does the nuclear envelope have?

- A. Nuclear membrane, nuclear pore.
- B. Double nuclear membrane, perinuclear space, nuclear pores.
- C. Nuclear lamina, nuclear pore, perinuclear space.
- D. Nuclear membrane, chromosome.
- E. Double nuclear membrane, chromosome.

20. When the cell has the duplicated number of chromosomes?

- A. S phase.
- B. Prophase.
- C. Metaphase.

- D. Anaphase.
- E. Telophase.

21. What does the cortical layer consist of?

- A. Enzymes, carbohydrates.
- B. Glycolipids, phospholipids.
- C. Carbohydrates, phospholipids.
- D. Phospholipids, cholesterol.
- E. Microtubules, microfilaments.

22. What types of the transport of substances into or away from the cell do you know?

- A. Free, eliminated.
- B. Hydrophilic, hydrophobic.
- C. Integral, peripheral.
- D. Pinocytosis, phagocytosis.
- E. Endocytosis, exocytosis.

23. What is the function of ribosomes?

- A. Incellular digestion.
- B. Detoxification.
- C. Generation of energy.
- D. Synthesis of proteins.
- E. Synthesis of carbohydrates and lipids.

24. What is the function of rough endoplasmic reticulum?

- A. Incellular digestion.
- B. Detoxification.
- C. Generation of energy.
- D. Synthesis of proteins.
- E. Synthesis of carbohydrates and lipids.

25. What does the mitochondrion have?

- A. Two membranes.
- B. Two subunits.
- C. Microfilaments.
- D. Microtubules.
- E. Single membrane.

26. Which organelles do cisternae have?

- A. Lysosome.
- B. Centriole.
- C. Golgi apparatus, endoplasmic reticulum.
- D. Mitochondria.
- E. Peroxisome.

27. Which organelles does the cytoskeleton include?

- A. Microfilaments, microtubules, intermediate filaments.
- B. Microfilaments, microtubules, centrosome.
- C. Two centrioles.
- D. Ribosomes, rough ER.
- E. Lysosomes, peroxisomes.

28. What types of lysosome do you know?

- A. Smooth, rough.
- B. Trans, meddle, cis.
- C. Mitochondrial, nuclear.
- D. Membranous, nonmembranous.
- E. Primary, secondary, residual body.

29. What components does the nucleolus have?

- A. Pars granulosa, pars fibrosa, pars amorphous.
- B. Double nuclear membrane, chromosome.
- C. Nucleolus, organelles, chromatin.
- D. Karyolemma, karyoplasma, chromatin, nucleolus.
- E. Euchromatin, heterochromatin.

30. When do chromosomes situate at the cell equator?

- A. S phase.
- B. Prophase.
- C. Metaphase.

- D. Anaphase.
- E. Telophase.

31. In a cell the synthesis of a histone proteins was artificially blocked. What cell structure will be damaged?

- A. Nucleolus.
- B. Nuclear chromatin.
- C. Golgi apparatus.
- D. Cell membrane.
- E. Nuclear envelope.

32. A chemical agent influenced cell plasmalemma. Consequently, the cell changed its form. Which layer of plasmalemma does take part in this process?

- A. Glycocalyx.
- B. Cortical.
- C. Bilipid.
- D. Hydrophilic.
- E. Hydrophobic.

33. In a histological specimen is observed a human somatic cell in the metaphase of mitotic cell division. How many chromosomes form the metaphase plate, taking into account that, every chromosome contains two sisterly chromatids?

- A. 48.
- B. 92.
- C. 23.
- D. 46.
- E. 24.

34. A patient with food poisoning has been hospitalizes. It is detected the hepatic detoxification mechanisms are disordered. Which organelles of hepatocytes have primarily caused the process?

- A. Mitochondria.
- B. Smooth endoplasmic reticulum.
- C. Rough endoplasmic reticulum.
- D. Golgi apparatus.
- E. Ribosomes.

35. Cytochemical investigation has shown the high concentration of hydrolytic enzymes in the cytoplasm of cells. The activity of which organelles does this fact indicate?

- A. Endoplasmic reticulum.
- B. Mitochondria.
- C. Polysomes.
- D. Lysosomes.
- E. Centrosome.

36. There is a large quantity of carbohydrates in the dietary intake of a human. What structure will be seen in the cytoplasm of hepatocytes?

- A. Fat droplets.
- B. Glycogen granules.
- C. One large fat droplet.
- D. Increase of free ribosomes quantity.
- E. Lipofuscin inclusions.

37. In the course of a scientific experiment a researcher destroyed a structure of one of cell parts, which broke cell division capacity. Which structure has been affected?

- A. Microfibriles.
- B. Glycocalyx.
- C. Golgi apparatus.
- D. Centrosome.
- E. Mitochondria.

38. Tumor cells culture was acted on with colchicine that blocks the synthesis of tubulin-proteins, which forms spindle apparatus. What stage of cellular cycle will be affected?

- A. G<sub>0</sub> period.
- B. G<sub>1</sub> phase.
- C. S phase.
- D. G<sub>2</sub> phase.
- E. Mitosis.

39. Prolonged influence of toxic substances on the organism led to considerable protein synthesis decrease in hepatocytes. Which organelles have suffered of intoxication most of all?

- A. Rough endoplasmic reticulum.
  - B. Mitochondria.
  - C. Microtubules.
  - D. Lysosomes.
  - E. Smooth endoplasmic reticulum.
40. A ribosomal structure has been affected in a cell. What processes will suffer first of all?
- A. Synthesis of protein.
  - B. Synthesis of nucleic acids.
  - C. Synthesis of carbohydrates.
  - D. Synthesis of lipids.
  - E. Synthesis of mineral substances.
41. Which layer of plasmalemma is responsible for the cell shape support?
- A. Cortical layer.
  - B. Glycocalyx.
  - C. Bilipid layer.
  - D. Hydrophilic layer.
  - E. Hydrophobic layer.
42. What are the principal components of the cell?
- A. Hyaloplasm, organelles, inclusions, plasmalemma.
  - B. Plasmalemma, organelles, cytoplasm, nucleus.
  - C. Nucleus, organelles, inclusions, hyaloplasm.
  - D. Plasmalemma, cytoplasm, nucleus.
  - E. Plasmalemma, cytoplasm, nucleus, organelles, inclusions.
43. Multinucleated structure, which is surrounded by cell membrane, is seen in histological specimen. What is this structure?
- A. Cell.
  - B. Group of cells.
  - C. Symplast.
  - D. Intercellular substance.
  - E. Ground substance.
44. What kind of transport does move the substances into the cell?
- A. Phagocytosis.
  - B. Pinocytosis.
  - C. Endocytosis.
  - D. Exocytosis.
  - E. Passive.
45. What types of endocytosis do you know?
- A. Phagocytosis and pinocytosis.
  - B. Pinocytosis and diffusion.
  - C. Endocytosis and osmosis.
  - D. Exocytosis and transcytosis.
  - E. Filtration and diffusion.
46. What types of intercellular junctions do you know:
- A. Simple and compound.
  - B. Isolative and communicative.
  - C. Synapse and nexus.
  - D. Communicative and occluding.
  - E. Adhesive and simple.
47. Which type of cell's junctions does the nexus belong to?
- A. Desmosome.
  - B. Isolative.
  - C. Synapse.
  - D. Communicative.
  - E. Adhesive.
48. What type of the intercellular junctions is characteristic for nerve cells?
- A. Tight.
  - B. Desmosome.
  - C. Synapse.
  - D. Nexus.
  - E. Hemidesmosome.
49. What are the desmosomal proteins?

- A. Desmoplacins, desmogleins.
- B. Lecitins, cadherins.
- C. Tubulins, transmembrane.
- D. Glycocalyx, phospholipids.
- E. Globulins, albumins.

50. Radiation overdose was received by the cell of laboratory animal. Albuminous fragments were formed within the cytoplasm of the cell as a result of this experiment. Such organelle play specific role to utilize these fragments. What is this organelle?

- A. The lysosomes.
- B. The Golgi apparatus.
- C. The ribosomes.
- D. The endoplasmic reticulum.
- E. The cell center.

51. The patient's temperature increases to 38°C. This fever was caused by impairment of the structure and function in such organelle. Which organelle is it?

- A. Mitochondria.
- B. The endoplasmic reticulum.
- C. The lysosomes.
- D. The ribosomes.
- E. The peroxysomes.

52. The main morphological manifestation of influencing of a poison of mushrooms on the liver is destruction of membranes of the lysosomes within hepatocytes. What will happen with the cells when the destruction of the majority of lysosomes has been occurred?

- A. The death of the cells can occur as a result of self-digestion of these cells.
- B. The synthesis of albuminous molecules will not occur.
- C. The synthesis of secretory products will not be completed.
- D. Utilization of chemically active atomic oxygen will be disturbed.
- E. The process of formation and accumulation of energy will be disturbed.

53. Electron micrograph shows a cell cytoplasm, which contains numerous tubules of the rough endoplasmic reticulum and dictyosomes of the Golgi apparatus. What function does this cell perform?

- A. Protein synthesis.
- B. Lipids synthesis and carbohydrates synthesis.
- C. Phagocytosis.
- D. The excretory function.
- E. The accumulative function.

54. Electron micrograph shows a cell cytoplasm, which contains numerous fibrous structures that form distinctive striated tissue. What function does this cell perform?

- A. The contractive function.
- B. Protein synthesis.
- C. Lipids synthesis and carbohydrates synthesis.
- D. The excretory function.
- E. The accumulative function.

55. Electron micrograph shows a cell cytoplasm, which contains numerous mitochondria. What does this cell do?

- A. Generate the energy.
- B. Synthesizes proteins.
- C. Synthesizes lipids carbohydrates.
- D. Makes phagocytosis.
- E. Excretes substances .
- F. Accumulates substances.

56. Micrograph of histological specimens [histological sections were stained by PAS (periodic acid Schiff) – reaction] shows numerous small pink-stained granules. What kind of inclusions are these granules:

- A. Trophic inclusions (i.e. glycogen).
- B. Excretory inclusions.
- C. Pigment inclusions.
- D. Secretory inclusions.
- E. Lipid inclusions.

57. It is known, that people of Negroid race have brown skin. What kind of the following inclusion is responsible for such skin color?

- A. Pigment inclusions (i.e. melanin).
- B. Excretory inclusions.
- C. Trophic inclusions.
- D. Secretory inclusions.

E. Hemoglobin.

58. Numerous cells which contain the primary and secondary lysosomes are determined in the region of the burn wound of the patient. What is the functional role of these cells?

- A. The cells perform the phagocytosis.
- B. The cells perform the secretory function.
- C. The cells perform the excretory function.
- D. The cells accumulate decay products.
- E. The cells generate energy.

59. The long-term influence of toxic matters on an organism resulted in considerable decreasing of protein synthesis which is realized by hepatocytes. Such organelles most suffered from intoxication. What is this organelle?

- A. Rough endoplasmic reticulum.
- B. Mitochondria.
- C. Microtubules.
- D. Lysosomes.
- E. Golgi complex.

60. There are secretory granules in the apical pole of the cytoplasm of the cell during the secretory cycle. The granules periodically disappear or appear within the field of vision. To what cell component do refer these granules?

- A. The inclusions.
- B. The microfilaments.
- C. The lysosomes.
- D. The peroxisomes.
- E. The granular endoplasmic reticulum.

61. What are the main chemical components of biologic membrane?

- A. Acids, proteins, polysaccharides.
- B. Phospholipids, acids, proteins.
- C. Phospholipids, proteins, cholesterol.
- D. Phospholipids, polysaccharides, cholesterol.
- E. Polysaccharides, acids, cholesterol.

62. Which layer of plasmalemma is responsible for the diffusion?

- A. Cortical layer.
- B. Lipoprotein layer.
- C. Supramembranous.
- D. Integral layer.
- E. Glycocalyx.

63. Which cell component has phospholipid bilayer?

- A. Cell membrane.
- B. Nuclear pore.
- C. Chromosomes.
- D. Nucleolus.
- E. Ribosomes.

64. What types of intercellular junctions do refer to adhesive?

- A. Hemidesmosome, desmosome, zonula adherens.
- B. Desmosome, nexus.
- C. Liniar, digitiform.
- D. Nexus, synapse.
- E. Synapse, zonula occludens.

65. Which type of cell junctions does the tight junction belong to?

- A. Desmosome.
- B. Isolative.
- C. Synapse.
- D. Communicative.
- E. Adhesive.

66. Which types of communicative junctions do you know?

- A. Tight.
- B. Desmosome.
- C. Hemidesmosome.
- D. Nexus, synapse.
- E. Zonula adherens.

67. Histone protein synthesis was blocked up artificially in a cell. What of the following cellular structure will be affected?

- A. The nuclear chromatin.
- B. The nucleoli.
- C. The Golgi complex.
- D. The cell membrane.
- E. The nuclear membrane.

68. A cell was affected by the matter that can to block up the nucleoli function. What of the following process of the cell vital activity will be impaired?

- A. The production of ribosomes and protein synthesis will be impaired.
- B. The production of ribosomes will be impaired.
- C. Protein synthesis will be impaired.
- D. Lipid synthesis will be impaired.
- E. The formation of polysomes will be impaired.

69. A cell was affected by the matter that can damage histones proteins. What of the following process of the cell vital activity will be impaired?

- A. The structure of the chromatin and chromosomal function will be changed.
- B. The structure of the euchromatin will be changed.
- C. The structure of the heterochromatin will be changed.
- D. The function of chromosomes will be changed.
- E. The formation of ribosomes will be impaired.

70. The nucleoli of the nuclei of cells which are in the tissue culture were damaged by radioactive irradiation. The following regeneration of such organelles will be problematic. What is this organelle?

- A. The ribosomes.
- B. The lysosomes.
- C. The endoplasmic reticulum.
- D. The microtubules.
- E. The Golgi complex.

71. 5 histological specimens are examined using a light microscope by an investigator. Definite signs of a symplast visible through the light microscope. What characteristic signs of symplast do you know?

- A. Numerous nuclei are disposed at the periphery of cytoplasm and enclosed by the plasmalemma.
- B. A small amount of the cytoplasm and the nucleus are enclosed by the plasmalemma.
- C. Plasmalemma surrounds the cytoplasm without nucleus.
- D. Branched fibers are irregularly arranged.
- E. Plasmalemma surrounds the cytoplasm without nucleus and nucleoli.

72. Single cells are seen in the histological specimen. Amorphous substance with fibers occupies the space between the cells. What is this substance?

- A. Noncellular multinuclear structures.
- B. Cellular nuclear-free structures.
- C. Extracellular matrix.
- D. Multinuclear structures.
- E. Nuclear-free structures.

73. There are specific proteins (i.e. glycoproteins) on the outer surface of the plasma membrane. What is the function of these specific proteins?

- A. The receptor function.
- B. The transport function.
- C. The enzymatic function.
- D. The structural function.
- E. The protective function.

74. The inner lining of the intestines (i.e. mucous membrane) is composed of cells. There is a frame (i.e. microvilli) on the surface area of these cells. This frame may be destructed as result of some diseases. In these cases such function of the cells may be impaired. Which function of these cells be impaired?

- A. The accumulative function.
- B. The digestion of food.
- C. The excretory function.
- D. The absorption of digested food.
- E. The synthetic function.

75. Electron micrograph shows two cells the plasmalemma of which are closely adjoined to each other. A small constant distance appears between them. What is the name of this type of intercellular contact?

- A. The simple intercellular contact.
- B. The isolative intercellular contact.
- C. The digitiform intercellular contact.
- D. The desmosome.
- E. The synapse.

76. Electron micrograph shows two cells the plasmalemma of which are joined to each other at a single point by fibrillar structures. Each cell and fibrillar structure is situated at right angles to each other. What is the name of this type of the intercellular contact?

- A. The synapse.
- B. The simple intercellular contact.
- C. The digitiform intercellular contact.
- D. The desmosome.
- E. The isolative intercellular contact.

77. Electron micrograph shows apical poles of the epithelial cells, cell membrane of which are maximally approached to each other. There is no a gap between these cell membranes. What is the name this type of the intercellular contact?

- A. The dense locking contact.
- B. The simple intercellular contact.
- C. The desmosome.
- D. The synapse.
- E. The digitiform intercellular contact.

78. Electron micrograph shows connecting link between two nervous cells. What type of intercellular junctions is characteristic for neurons?

- A. The synapse.
- B. The simple intercellular contact.
- C. The desmosome.
- D. The dense locking contact.
- E. The digitiform intercellular contact.

79. The cellular cytoplasm was affected by a chemical agent. Shape of the cell was changed as a result of this impairment. Such layer of the plasmalemma took part in this process. Which layer is it?

- A. The hydrophilic layer.
- B. The glycocalyx.
- C. The bilipid layer.
- D. The cortical layer.
- E. The hydrophobic layer.

80. Micrograph of a histological specimen (the histological section was stained by iron hematoxylin) shows a cell. There are no the nucleoli and the nuclear membrane in the cell. The chromosomes are freely placed. The centrioles are displaced toward poles of the cell. This cell passes through such phase of the cellular cycle. What phase is it?

- A. Interphase.
- B. Anaphase.
- C. Metaphase.
- D. Telophase.
- E. Prophase.

81. Micrograph of a histological specimen (the histological section was stained by iron hematoxylin) shows a cell. There are spiral chromosomes arranged along the center (equator) of the cell and the centrioles which are displaced toward poles. This cell passes through such phase of the cellular cycle. What phase is it?

- A. Prophase.
- B. Metaphase.
- C. Anaphase.
- D. Telophase.
- E. Interphase.

82. Micrograph of a histological specimen (the histological section was stained by iron hematoxylin) shows a cell. There are condensed chromosomes at the opposite poles of this cell. This cell passes through such phase of the cellular cycle. What phase is it?

- A. Metaphase.
- B. Prophase.
- C. Anaphase.
- D. Telophase.
- E. Interphase.

83. Micrograph of a histological specimen (the histological section was stained by iron hematoxylin) shows a cell, shape of which looks like "a dumb-bell". There are spiral chromosomes at poles of the cell. This cell passes through such phase of the cellular cycle. What phase is it?

- A. Anaphase.
- B. Telophase.
- C. Metaphase.
- D. Prophase.
- E. Interphase.

84. Micrograph of a histological specimen (the histological section was stained by iron hematoxylin) shows a cell, the nucleus of which is relatively large and contains the nucleolus. This cell passes through such phase of the cellular cycle. What phase is it?
- A. Interphase.
  - B. Prophase.
  - C. Anaphase.
  - D. Metaphase.
  - E. Telophase.

## EMBRYOLOGY

1. How many chromosomes does androspermium have?
  - A. 22 autosomes + 1 X or Y sex chromosome.
  - B. 22 autosomes + 1 X sex chromosome.
  - C. 22 autosomes + 1 Y sex chromosome.
  - D. 22 autosomes + 1 X + 1 Y sex chromosome.
  - E. 22 pairs autosomes+ 1 pair sex chromosome.
2. What does acrosome mean?
  - A. Inclusions.
  - B. Special granules.
  - C. Mitochondria.
  - D. Derivative of Golgi apparatus.
  - E. Part of nucleus.
3. What are the types of human oocyte?
  - A. Polylecithal, olygolecithal.
  - B. Alecithal, isolecithal.
  - C. Polylecithal, primary isolecithal.
  - D. Polylecithal, secondary isolecithal.
  - E. Olygolecithal, secondary isolecithal.
4. Which tunics does oocyte have?
  - A. Theca externa, theca interna, oolemma.
  - B. Theca externa, theca interna, follicular antrum.
  - C. Corona radiata, zona pelucida, oolema.
  - D. Corona radiata, tunica of fertilization, oolemma.
  - E. Corona radiata, zona pelucida, cortical granules.
5. What is the function of acrosomal reaction?
  - A. Penetration of theca externa.
  - B. Denudation of corona radiata.
  - C. Penetration of corona radiata.
  - D. Penetration of zona pelucida.
  - E. Penetration of oolemma.
6. What does not do spermatozoon in fertilization?
  - A. Add half chromosome.
  - B. Determine sex.
  - C. Stimulate cleavage.
  - D. Add centriole.
  - E. Add acrosome.
7. When does the two-cell stage of cleavage begin?
  - A. Immediately after fertilization.
  - B. 3 hours after fertilization.
  - C. 30 hours after fertilization.
  - D. 3 days after fertilization.
  - E. Immediately after implantation.
8. When does implantation begin?
  - A. During the 1<sup>st</sup> day after fertilization.
  - B. During 3<sup>rd</sup> days after fertilization.
  - C. During 7<sup>n</sup> days after fertilization.
  - D. During 12<sup>th</sup> days after fertilization.
  - E. During 14<sup>th</sup> days after fertilization.
9. What types of cells in blastocyst do you know?

- A. Embryoblast and trophoblast.
  - B. Syncaryon and zygote.
  - C. Oocyte and spermatozoa.
  - D. Cytotrophoblast and syncytiotrophoblast.
  - E. Morula and blastula.
10. When does tunic of fertilization disappear?
- A. Before ovulation.
  - B. Before fertilization.
  - C. Before cleavage.
  - D. Before implantation.
  - E. Before gastrulation.
11. How many blastomers does morula have?
- A. 1-8.
  - B. 2-8.
  - C. 12-32.
  - D. 64-99.
  - E. 64-107.
12. What types of chorionic villi do you know?
- A. Maternal and fetal.
  - B. Frondosum and leave.
  - C. Chorionic and amniotic.
  - D. Basalis, parietalis, capsularis.
  - E. Primary, secondary, tertiary.
13. How is the morphological-functional unit of placenta called?
- A. Cotyledon.
  - B. Amnion.
  - C. Allantois.
  - D. Decidual plate.
  - E. Umbilical cord.
14. When does amnion begin development?
- A. 1<sup>st</sup> week.
  - B. 2<sup>nd</sup> week.
  - C. 3<sup>rd</sup> week.
  - D. 4<sup>th</sup> week.
  - E. 5<sup>th</sup> week.
15. During gastrulation, which of the following occurs to form a trilaminar embryo?
- A. Decrease in cell division of the epiblast cells
  - B. Formation of a primitive streak
  - C. Migration of trophoblast cells into the interior of the embryo
  - D. Formation of the neural plate
  - E. Delamination
16. What is origin of the epithelium of stomach?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Endoderm.
  - D. Neural tube.
  - E. Notochord.
17. What is origin of striated skeletal muscles?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Dermatome.
  - D. Myotome.
  - E. Sclerotome.
18. What is origin of connective tissue of skin?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Dermatome.
  - D. Myotome.
  - E. Sclerotome.
19. What is origin of brain and spinal cord?

- A. Surface ectoderm.
- B. Mesoderm.
- C. Endoderm.
- D. Neural tube.
- E. Neural crests.

20. What is origin of nervous system?

- A. Ectoderm.
- B. Mesoderm.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

21. How many chromosomes does gynicospermium have?

- A. Autosomes + 1 X or Y sex chromosome.
- B. 22 autosomes + 1 X sex chromosome.
- C. 22 autosomes + 1 Y sex chromosome.
- D. 22 autosomes + 1 X + 1 Y sex chromosome.
- E. 22 pairs autosomes + 1 pair sex chromosome.

22. What does the neck of spermatozoon consist of?

- A. Acrosomes.
- B. Microtubules.
- C. Only proximal centriole.
- D. Distal and proximal centrioles.
- E. Axial fibers.

23. What does the head of spermatozoon consist of?

- A. Acrosome and nucleus.
- B. Microtubules.
- C. Mitochondria.
- D. Centrioles.
- E. Axonemal complex.

24. When is perivitelline space formed?

- A. After ovulation.
- B. During oocyte maturation.
- C. During fertilization.
- D. After cleavage.
- E. After implantation.

25. What is the function of cortical reaction?

- A. Monospermy.
- B. Polyspermy.
- C. To start penetration.
- D. To start denudation.
- E. To start second division.

26. When does cleavage occur?

- A. 1-3 hours after fertilization.
- B. 1-30 hours after fertilization.
- C. 30 hours – till 5 days after fertilization.
- D. 1-5 days after fertilization.
- E. 1-7 days after fertilization.

27. What stages of implantation do you know?

- A. Primary and secondary.
- B. Early and late.
- C. Cleavage and gastrulation.
- D. Adhesion and invasion.
- E. Growth and maturation.

28. When does early gastrulation begin?

- A. During 1<sup>st</sup> day after fertilization.
- B. During 3<sup>rd</sup> days after fertilization.
- C. During 7<sup>th</sup> days after fertilization.
- D. During 7<sup>th</sup> -14<sup>th</sup> days after fertilization.
- E. During 27<sup>th</sup> days after fertilization.

29. What layers of 7-14 days germ disk do you know?

- A. Epiblast and hypoblast.
  - B. Cytotrophoblast and syncytiotrophoblast.
  - C. Embryoblast and trophoblast.
  - D. Ectoderm and endoderm.
  - E. Ectoderm, mesoderm and endoderm.
30. Home pregnancy test/immunoassay detects which of the following hormone to confirm a pregnancy?
- A. Estrogen
  - B. Progesterone
  - C. Human chorionic gonadotropin
  - D. Follicle-stimulating hormone
  - E. Lactogen
31. The trophoblast cells give rise to the \_ whereas the inner cell mass gives rise to the \_.
- A. Chorion, embryo
  - B. Amnion, embryo
  - C. Yolk sac, placenta
  - D. Chorion, zygote
  - E. Amnion, chorion
32. What vessels does umbilical cord have?
- A. One artery and one vein.
  - B. One artery and two veins.
  - C. Two arteries and one vein.
  - D. Two arteries and two veins.
  - E. Nothing.
33. When does primary yolk sac begin development?
- A. 1<sup>st</sup> week.
  - B. 2<sup>nd</sup> week.
  - C. 3<sup>rd</sup> week.
  - D. 4<sup>th</sup> week.
  - E. 5<sup>th</sup> week.
34. Which IS NOT a function of the placenta?
- A. Allow exchange nutrients and wastes
  - B. Allow exchange of blood cells between mother and fetus.
  - C. Produce human chorionic gonadotropin and progesterone.
  - D. Release estrogen to prepare body for labor.
  - E. Prepare mammary glands to produce milk.
35. What is origin of oesophagus?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Endoderm.
  - D. Neural tube.
  - E. Notochord.
36. What is origin of myocardium?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Dermatome.
  - D. Myotome.
  - E. Sclerotome.
37. What is origin of vertebral column cartilages?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Dermatome.
  - D. Myotome.
  - E. Sclerotome.
38. What is origin of epidermis?
- A. Ectoderm.
  - B. Mesoderm.
  - C. Dermatome.
  - D. Myotome.
  - E. Sclerotome.
39. What is origin of blood cell?

- A. Ectoderm.
- B. Mesenchyme.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

40. How many microtubules does axonemal complex?

- A. 9 pairs of peripheral and 1 pair centrally.
- B. 6 pairs of peripheral and 1 pair centrally.
- C. 6 pairs of peripheral and 2 pair centrally.
- D. 9 pairs of peripheral and 2 pair centrally.
- E. 9 triplets of peripheral and 1 pair centrally.

41. What are the components of spermatozoon tail?

- A. Nucleus, mitochondria, distal centriole.
- B. Axial fibers, nucleus, mitochondria.
- C. Acrosome, mitochondria, centrosome.
- D. Fibrous sheath, mitochondria, axoneme.
- E. Axial fibers, mitochondria, centrosome.

42. Where is perivitellinum space?

- A. Between oolema and zona pelucida.
- B. Between oolema and corona radiata.
- C. Between trophoblast and embryoblast.
- D. Between trophoblast and tunica of fertilization.
- E. Between two uterine gland.

43. Where does fertilization occur?

- A. In ovary.
- B. In uterine tube.
- C. In uterine.
- D. In uterine gland.
- E. In uterine mucosa.

44. What is the type of human cleavage?

- A. Complete, synchronous, unequal.
- B. Partly, synchronous, unequal.
- C. Partly, asynchronous, unequal.
- D. Complete, asynchronous, unequal.
- E. Complete, synchronous, equal.

45. What stages of gastrulation do you know?

- A. Primary and secondary.
- B. Early and late.
- C. Cleavage and gastrulation.
- D. Adhesion and invasion.
- E. Growth and maturation.

46. When does late gastrulation begin?

- A. During 1<sup>st</sup> day after fertilization.
- B. During 3<sup>rd</sup> days after fertilization.
- C. During 7<sup>th</sup> days after fertilization.
- D. After 14<sup>th</sup> days after fertilization.
- E. After 27<sup>th</sup> days after fertilization.

47. What layers of 15-20 days germ disk do you know?

- A. Syncaryon and zygote.
- B. Cytotrophoblast and syncytiotrophoblast.
- C. Embryoblast and trophoblast.
- D. Ectoderm and endoderm.
- E. Ectoderm, mesoderm and endoderm.

48. Which is bigger?

- A. Blastula.
- B. Synkaryon.
- C. Zygote.
- D. Morula.
- E. All of them has same size.

49. What part of placenta do you know?

- A. Maternal and fetal.
- B. Frondosum and leave.
- C. Chorionic and amniotic.
- D. Basalis, parietalis, capsularis.
- E. Primary, secondary, tertiary.

50. What structures does not umbilical cord have?

- A. Vessels.
- B. Allantois.
- C. Jelly of Wharton.
- D. Amniotic cavity.
- E. Yolk sac.

51. When does allantois begin development?

- A. 1<sup>st</sup> week.
- B. 2<sup>nd</sup> week.
- C. 3<sup>rd</sup> week.
- D. 4<sup>th</sup> week.
- E. 5<sup>th</sup> week.

52. The maternal component of the placenta is the:

- A. Chorion
- B. Amnion
- C. Endometrium
- D. Myometrium
- E. Mesoderm

53. What is origin of trachea?

- A. Ectoderm.
- B. Mesoderm.
- C. Endoderm.
- D. Neural tube.
- E. Notochord.

54. What is origin of smooth muscles?

- A. Ectoderm.
- B. Mesenchyme.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

55. What is origin of bone?

- A. Ectoderm.
- B. Mesoderm.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

56. What is origin of dermis of skin?

- A. Ectoderm.
- B. Mesoderm.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

57. What is origin of kidney?

- A. Ectoderm.
- B. Mesoderm.
- C. Dermatome.
- D. Myotome.
- E. Sclerotome.

58. In which period of development are most organ systems highly susceptible to injury?

- A. Early development
- B. Embryonic development
- C. First trimester
- D. Second trimester
- E. Third trimester

59. The male and female processes of meiosis are equal.

- A. True.
- B. False; for males it results in four spermatids and females results in two ovum with two polar bodies.
- C. False; for males it results in four spermatozoa and females results in one ovum with three polar bodies.
- D. False; for males and females it results in four spermatids/ovum but three of the ovum eventually dissolve as polar bodies.
- E. False; for males it results in one spermatid with three polar bodies and females results in two ovum with two polar bodies.

60. The origin of germ cells is:

- A. Embryonic endoderm
- B. Extraembryonic endoderm
- C. Embryonic ectoderm
- D. Extraembryonic mesoderm
- E. Embryonic mesoderm

61. In male gametogenesis, what is the role of Sertoli cells?

- A. Replicate primary spermatocytes
- B. Give rise to a population of type A spermatogonia
- C. Support and isolate gamete cells
- D. Replicate type A pale spermatogonia
- E. Give rise to a population of type B spermatogonia

62. Which of the following is *NOT* a step involved in spermatogenesis prior to losing connection with Sertoli cells?

- A. Flagella lysis
- B. Condensation of nucleus
- C. Formation of neck region and tail
- D. Loss of cytoplasm
- E. Acrosome addition

63. Where does the process of sperm capacitation take place?

- A. Within the testes
- B. Within the male urethra
- C. Within the female genital tract
- D. Within the ovum
- E. Within the embryo

64. In what phase do the oogonia become arrested until puberty?

- A. Meiosis II metaphase
- B. Meiosis II prophase
- C. Meiosis I metaphase
- D. Meiosis I prophase
- E. G-phase

65. After the primary follicle takes in fluid and forms a large antrum, it is called a:

- A. Stroma
- B. Primordial follicle
- C. Thecal follicle
- D. Graafin follicle
- E. Antral follicle

66. The first meiotic division is completed just prior to ovulation, forming a secondary oocyte. The second division begins immediately but does not finish unless:

- A. Human chorionic gonadotropin (hCG) levels are high
- B. Fertilization takes place
- C. The epiblast is no longer present
- D. The sperm are uncapacitated
- E. A development anomaly is present

67. The syncytiotrophoblast secretes \_ causing the corpus luteum to secrete \_, which maintains pregnancy.

- A. Gonadotropin-releasing hormone (GnRH); Luteinizing hormone (LH)
- B. GnRH; Follicle-stimulating hormone (FSH)
- C. GnRH; human chorionic gonadotropin (hCG)
- D. hCG; estrogens
- E. hCG; progesterone

68. After the Graafian follicle breaks and before fertilization takes place, the secondary oocyte is surrounded by cells called:

- A. Fimbria
- B. Zona pellucida
- C. Corona radiata

- D. Acrosomes
- E. Oocytes

69. What is the result of the cortical reaction?

- A. The corona radiata forms
- B. The zona pellucida forms
- C. Sperm can now enter the egg
- D. Sperm can no longer enter the egg
- E. Acrosome is removed

70. Which of the following does *NOT* take place during fertilization?

- A. Male pronucleus forms
- B. Endometrial implantation occurs
- C. Restoration of a diploid genome
- D. Determination of genetic sex of the embryo
- E. Cleavage initiated

71. Which structure bounds the cells after fertilization as they compact to form the morula?

- A. Zona reaction
- B. Corona radiata
- C. Pronucleus
- D. Inner cell mass
- E. Outer cell mass

72. How is called the cavity between the inner cell mass (embryoblast) and outer cell mass (trophoblast):

- A. Antrum
- B. Embryonic gap
- C. Trophoblastic reticulum
- D. Epiblast
- E. Blastocoele

73. An ectopic pregnancy would occur if implantation occurred in all of the following places *EXCEPT*:

- A. Rectum
- B. Bladder
- C. Uterus
- D. Cervix
- E. Fallopian tube

74. The cells of the embryoblast form the hypoblast and epiblast, which begin to form the \_ cavity.

- A. Chorionic
- B. Antrum
- C. Blastocoele
- D. Amniotic
- E. Epiblastic

75. The two layers of extraembryonic mesoderm are called:

- A. Endoderm; Mesoderm
- B. Primary; Secondary
- C. Somatopleuric; Splanchnopleuric
- D. Mesenchyme; Parachyme
- E. Epiblast; Hypoblast

76. On day nine, trophoblastic lacunae and maternal sinusoids begin to form around what cells:

- A. Exoderm
- B. Extraembryonic coelom
- C. Extraembryonic splanchnopleuric
- D. Exocoelomic
- E. Syncytiotrophoblast

77. The cells that continue to divide from the trophoblast are called:

- A. Syncytiotrophoblast
- B. Cytotrophoblast
- C. Epiblast
- D. Hypoblast
- E. Tertiary stem villi

78. On what day of the embryonic development does gastrulation begin?

- A. 14
- B. 5
- C. 7

- D. 16
- E. 22

79. The notochord is derived from:

- A. Mesoderm only
- B. Endoderm only
- C. Ectoderm only
- D. Hypoblast
- E. Epiblast

80. The notochord has all of the following functions *EXCEPT*:

- A. Induces the migration of germ cells
- B. Induces the overlying embryonic ectoderm to differentiate into the neural plate
- C. Vertebral column development
- D. Forms anatomic midline
- E. Forms nucleus pulposus

81. Neural crest gives rise to all of the following *EXCEPT*:

- A. Autonomic and spinal nerve ganglia
- B. Pigment cells
- C. Epidermis and its derivatives
- D. Medulla of the adrenal gland
- E. Pia and arachnoid mater of the brain and spinal cord

82. The axial skeleton forms from the:

- A. Paraxial mesoderm
- B. Intermediate mesoderm
- C. Lateral mesoderm
- D. Surface ectoderm
- E. Neural crest cells

83. The beginning of the somite development is characteristic for what week of the embryonic development:

- A. First week
- B. Second week
- C. Third week
- D. Fourth week
- E. Fifth week

84. Which structure helps form the lining of the GI (gastro-intestinal) tract and allantois?

- A. Endoderm
- B. Ectoderm
- C. Paraxial mesoderm
- D. Intermediate mesoderm
- E. Lateral mesoderm

85. Which structures remain most vulnerable to teratogens during the fetal period?

- A. Vertebral column and back muscles
- B. Esophagus and anus
- C. Hands and feet
- D. Liver and spleen
- E. Eyes and brain

86. The somites differentiate into a \_\_, \_\_, and \_\_:

- A. Dermatome, Myotome, Sclerotome
- B. Myotome, Sclerotome, Dermatome
- C. Epidermatome, Myotome, Dermatome
- D. Sclerotome, Myotome, Dermatome
- E. Dermomyotome, Sclerotome, Epidermatome

87. Which of the following statements is *NOT* true?

- A. Endoderm gives rise to neural crest cells
- B. The notochord induces overlying ectoderm to form the neural plate
- C. The neural plate folds and fuses to form the neural tube
- D. Neural crest cells arise from the lateral lips of the neural plate
- E. The neural tube gives rise to the spinal cord and brain

88. What event does initiate cleavage?

- A. Implantation
- B. Fertilization
- C. Ovulation

- D. Blastocyst formation
- E. Differentiation

89. The placenta has all of the following functions *EXCEPT*:

- A. Deoxygenation of blood
- B. Hormone production
- C. Protection
- D. Nutrition
- E. Excretion

90. The decidua, or maternal part of the placenta (endometrium) has three parts. Which part is deep to the fetus and forms at the implantation site?

- A. Decidua parietalis
- B. Decidua capsularis
- C. Decidua basalis
- D. Decidua visceralis
- E. Decidua fetalis

91. The finger-like projections that are made of cytotrophoblast and syncytiotrophoblast are called:

- A. Somatic villi
- B. Splanchnic villi
- C. Connection stalks
- D. Secondary chorionic villi
- E. Primary chorionic villi

92. When the mesenchyme of the villi gives rise to blood vessels, the villi are known as:

- A. Primary
- B. Secondary
- C. Tertiary
- D. Mature
- E. Immature

93. At the fetomaternal junction, projections of decidua basalis towards the chorionic plate serve to divide the fetal placenta into irregular areas called:

- A. Cotyledons
- B. Anhorning villi
- C. Smooth chorion
- D. Villus chorion
- E. Endometrium

94. During labor, what membrane ruptures ("water breaks")?

- A. Amniochorionic
- B. Chorionic
- C. Decidua capsularis
- D. Decidua parietalis
- E. Choriocapsularis

95. In placental circulation, what is the next path of blood after passing through the umbilical arteries?

- A. Fetus
- B. Chorionic arteries
- C. Capillary bed
- D. Umbilical veins
- E. Internal iliac arteries (maternal)

96. The placental barrier is made all of following *EXCEPT*:

- A. Cytotrophoblast
- B. Connective tissue layer
- C. Syncytiotrophoblast
- D. Endothelium of capillary
- E. Chorionic artery

97. The vessels of the umbilical cord are:

- A. 1 artery, 1 vein
- B. 2 arteries, 2 veins
- C. 1 artery, 2 veins
- D. 2 arteries, 1 veins
- E. 2 arteries, veins are absent

98. What germ layer is the dermis derived from?

- A. Paraxial mesoderm

- B. Intermediate mesoderm
- C. Lateral mesoderm
- D. Neural crest
- E. Endoderm

99. What germ layer is the epidermis derived from?

- A. Paraxial mesoderm
- B. Intermediate mesoderm
- C. Lateral mesoderm
- D. Neural crest
- E. Ectoderm

100. What germ layer forms the melanocytes?

- A. Endoderm
- B. Neural tube
- C. Neural crest
- D. Paraxial mesoderm
- E. Lateral mesoderm

101. Which germ layer forms the inner ear?

- A. Endoderm
- B. Ectoderm
- C. Paraxial mesoderm
- D. Intermediate mesoderm
- E. Lateral mesoderm

102. The otic placode develops as the thickening of which of the following?

- A. Ectoderm
- B. Endoderm
- C. Intermediate mesoderm
- D. Paraxial mesoderm
- E. Lateral mesoderm

103. Which of the following pairs of terms are identical?

- A. Pregnancy – Gestation
- B. Embryo – Blastula
- C. Fertilization – Conception
- D. Placenta – Uterus
- E. Fertilization – Implantation

104. Human development begins with:

- A. Birth
- B. Fertilization
- C. Implantation
- D. Gastrulation
- E. Neurulation

105. Mitosis first occurs in the fertilized egg during:

- A. Cleavage
- B. Blastulation
- C. Placentation
- D. Decidualization
- E. Formation of the trophoblast

106. In the makeup of the fetal membranes, the \_\_ gives rise to the fetal part of the placenta, while the \_\_ forms the fluid-filled cavity which cushions the embryo and fetus.

- A. Chorion, amnion
- B. Amnion, yolk sac
- C. Morula, blastula
- D. Amnion, chorion
- E. Umbilical cord, deciduas

107. Just before implantation the blastocyst into the endometrium, the embryo receives its nutrients from the:

- A. Mother
- B. Corpus luteum
- C. Mucous secretions of the uterine tube and uterus
- D. Graafian follicle
- E. Ovum

108. The functions of the placenta are all of the following *EXCEPT*:

- A. Nutrients and wastes exchange
- B. Hormone production
- C. Follicle production
- D. Gas exchange
- E. Protection

109. Which of the following is a function of the acrosome during fertilization:

- A. To block polyspermy
- B. To help propel the sperm
- C. To digest the exterior coats of the oocyte
- D. To nourish the mitochondria of the sperm
- E. To trigger the completion of meiosis by the sperm cell

110. Which developmental sequence is correct?

- A. Cleavage, blastula, gastrula, morula and neurula
- B. Cleavage, gastrula, morula, neurula and blastula
- C. Cleavage, morula, blastula, gastrula and neurula
- D. Gastrula, morula, neurula, blastula, cleavage
- E. Morula, cleavage, gastrula, neurula, blastula

111. After gastrulation, the outer-to-inner sequence of tissue layers is:

- A. Endoderm, ectoderm, mesoderm
- B. Mesoderm, endoderm, ectoderm
- C. Ectoderm, mesoderm, endoderm
- D. Ectoderm, endoderm, mesoderm
- E. Endoderm, mesoderm, ectoderm

112. Without the formation of ectoderm, we would lack:

- A. Nervous system
- B. Liver
- C. Pancreas
- D. Heart
- E. Muscles

113. Which of the following is mismatched?

- A. Mesoderm – kidney
- B. Endoderm – stomach
- C. Ectoderm – eye
- D. Ectoderm – liver
- E. Mesoderm – somites

114. Which of the following is LEAST related to the others?

- A. Zona pellucida
- B. Amnion
- C. Chorion
- D. Allantois
- E. Yolk sac

115. In humans, what is the major function of the yolk sac during development?

- A. It transfers nutrients to the embryo
- B. It differentiates into the placenta
- C. It becomes a fluid-filled sac that surrounds the embryo
- D. It produces blood cells
- E. It stores waste products from the embryo until the placenta development

116. Fertilization is completed with the:

- A. Formation of a zygote containing 23 chromosomes
- B. Formation of male and female pronuclei
- C. Formation of a morula containing 46 chromosomes
- D. Formation of a zygote containing 46 chromosomes
- E. Formation of blastomere containing 46 chromosomes

117. The completion of telophase II produces:

- A. Four gametes, each containing 46 chromosomes
- B. Four gametes, each containing 23 chromosomes
- C. Single gamete that contains 46 chromosomes
- D. Single gamete that contains 23 chromosomes
- E. Two gametes, each containing 23 chromosomes

118. During fertilization, the process of cortical reaction is important in:

- A. Ensuring the fusion of sperm and oocyte nuclei
- B. Preventing penetration by additional sperm
- C. Preventing of monospermy
- D. Producing of acrosomal reaction
- E. Producing the capacitation

119. The chorion develops from the:

- A. Endoderm and mesoderm
- B. Ectoderm and mesoderm
- C. Trophoblast and endoderm
- D. Mesoderm and trophoblast
- E. Ectoblast and trophoblast

120. Blood flows from the placenta via:

- A. Two umbilical veins and a single umbilical artery
- B. Two umbilical arteries and a single umbilical vein
- C. A single umbilical artery and a single umbilical vein
- D. Two umbilical arteries and two umbilical veins
- E. Three umbilical arteries and a single umbilical vein

121. The hormone which placenta DOES NOT produce?

- A. Chorionic gonadotropin (hCG)
- B. Estrogene
- C. Lactogen
- D. Progesterone
- E. Oxytocin

122. Throughout embryonic and fetal development metabolic wastes generated by the fetus are eliminated by transfer to:

- A. Maternal circulation
- B. Amniotic fluid
- C. Chorion
- D. Allantois
- E. Yolk sac

123. The primitive umbilical cord contains:

- A. The amnion, allantois and chorion
- B. Two umbilical arteries and the amnion
- C. A single umbilical vein and the chorion
- D. The allantois, blood vessels, yolk sac
- E. Two umbilical veins and allantois

124. In humans, spermatogenesis and oogenesis differ in that:

- A. Oogenesis begins at puberty
- B. Spermatogenesis begins at birth
- C. Oogenesis produces four haploid cells, whereas spermatogenesis produces only one functional sperm
- D. Oogenesis produces one functional gamete, whereas spermatogenesis produces four functional gametes
- E. Spermatogenesis is not complete until fertilization occurs

125. What is the main function of the chorion?

- A. Creating a fluid-filled space around the embryo to provide protection
- B. Nutrient storage
- C. Transfer nutrients from the maternal blood
- D. Excretion
- E. Is the morphological substrate for placenta

## ANSWERS

### PART I. Cytology, embryology, general histology

#### Cytology

1. B	18. A	35. D	52. A	69. A
2. B	19. B	36. B	53. A	70. A
3. B	20. A	37. D	54. A	71. A
4. E	21. E	38. E	55. A	72. C
5. B	22. E	39. A	56. A	73. A
6. D	23. D	40. A	57. A	74. D
7. B	24. D	41. A	58. A	75. A
8. B	25. A	42. D	59. A	76. D
9. D	26. C	43. C	60. A	77. A
10. A	27. A	44. C	61. C	78. A
11. D	28. E	45. A	62. B	79. D
12. D	29. A	46. A	63. A	80. E
13. A	30. C	47. D	64. A	81. B
14. C	31. B	48. C	65. B	82. C
15. D	32. B	49. A	66. D	83. B
16. D	33. D	50. A	67. A	84. A
17. D	34. B	51. A	68. A	

#### Embryology

1. C	27. D	53. C	79. E	105. A
2. D	28. D	54. B	80. A	106. A
3. E	29. A	55. E	81. C	107. C
4. C	30. C	56. C	82. A	108. C
5. D	31. A	57. B	83. C	109. C
6. E	32. C	58. B	84. A	110. C
7. C	33. B	59. C	85. E	111. C
8. C	34. B	60. B	86. D	112. A
9. A	35. A	61. C	87. A	113. D
10. D	36. B	62. A	88. B	114. A
11. C	37. E	63. C	89. A	115. D
12. E	38. A	64. D	90. C	116. D
13. A	39. B	65. D	91. E	117. B
14. B	40. A	66. B	92. C	118. B
15. B	41. D	67. E	93. A	119. D
16. C	42. A	68. C	94. A	120. B
17. D	43. B	69. D	95. B	121. E
18. C	44. D	70. B	96. E	122. A
19. D	45. B	71. A	97. D	123. D
20. A	46. D	72. E	98. A	124. D
21. B	47. E	73. C	99. E	125. E
22. D	48. E	74. D	100. C	
23. A	49. A	75. C	101. B	
24. C	50. D	76. E	102. A	
25. A	51. C	77. B	103. A	
26. C	52. C	78. C	104. B	