

Name of applicant:

1. The cell theory was postulated by:
 - a) Robert Koch
 - b) Mathias J. Schleiden and Theodor Schwann
 - c) Thomas H. Morgan
 - d) Louis Pasteur
 - e) none of the answers is correct

2. Which of the following statements is *false*?
 - a) Some retroviruses can induce the development of cancer
 - b) Viruses are composed of a nucleic acid core and a protein coat known as the capsid
 - c) The viruses can be used as vectors in a program of gene therapy
 - d) The bacteriophages are capable of phagocytosis of bacteria
 - e) All four answers are correct

3. Which of the following *is not* a characteristic of living organisms?
 - a) all organisms are composed of cells
 - b) irritability
 - c) metabolism
 - d) asexual reproduction
 - e) none of the answers is correct

4. The eukaryotic cell
 - a) has distinct organelles that carry out specific functions
 - b) lacks a distinct nucleus
 - c) is the type of cell that bacteria are made of
 - d) was the first to evolve
 - e) none of the answers is correct

5. The eukaryotic cell consists of two main compartments, the cytoplasmic compartment and
 - a) the smooth endoplasmic reticulum
 - b) the mitochondrion
 - c) the nucleus
 - d) the Golgi apparatus
 - e) none of the answers is correct

6. In the following three columns, cell constituents, biochemical components and biochemical functions are listed. Which of the triads has a meaning?

a) chloroplast	chlorophyll	glucose oxidation
b) mitochondria	adenine	synthesis of nucleic acids
c) Golgi apparatus	ribose	synthesis of cellulose
d) ribosome	uracil	synthesis of RNA
e) none of the triads is meaningful		

7. In eukaryotic cells, DNA is localised in
 - a) mitochondria and lysosomes
 - b) endoplasmic reticulum and chloroplasts
 - c) mitochondria and chloroplasts
 - d) Golgi apparatus and nucleus
 - e) none of the answers is correct

8. Lymphocytes are white blood cells that secrete antibody proteins. By using radioactively labelled amino acids, one can track the path of these proteins through the cytoplasm. Which of the following could be the path of an antibody to the cell membrane?
 - a) rough ER → Golgi → plasma membrane
 - b) Golgi → rough ER → plasma membrane
 - c) chloroplast → Golgi → plasma membrane
 - d) smooth ER → lysosome → plasma membrane
 - e) none of the answers is correct

9. Which of the following cell types arise by meiosis?
 a) spermatogonia b) neurons c) blastomeres d) meristem cells
 e) none of the answers is correct
10. Which of the following processes occurs in the anaphase of mitotic division?
 a) condensation of chromosomes b) restoration of the nuclear envelope
 c) formation of the spindle d) movement of chromosomes to the cell poles
 e) none of the answers is correct
11. RNA polymerase:
 a) joins together ribonucleotides attached complementarily to a DNA template to form an RNA molecule
 b) joins nucleotides adsorbed on the surface of double-stranded DNA together
 c) polymerises nucleotides during DNA replication
 d) joins free ribonucleotides together to form a polynucleotide chain
 e) none of the answers is correct
12. Which of the following cell constituents are based on microtubules?
 a) mitochondria and flagella b) spindle and centrioles
 c) cellulosic microfibrils and cilia d) chromosomes and basal bodies
 e) none of the answers is correct
13. When crossing individuals with genotypes AaBb x AaBb, the ratio of phenotypes (A,B dominant alleles, a,b, recessive alleles) will be as follows:
 a) 3:1 b) 9:3:3:1 c) 1:2:2:1 d) 1:1:1:1
 e) none of the answers is correct
14. Which of the following types of nucleic acids is a carrier of anticodon?
 a) mt DNA b) mRNA c) tRNA d) rRNA
 e) none of the answers is correct
15. In his experiments leading to the discovery of genetic laws J. G. Mendel used the following organism:
 a) Arabidopsis thaliana b) Pisum sativum c) Drosophila melanogaster
 d) Zea mays e) none of the answers is correct
16. A molecule that *is not* part of a nucleotide is
 a) phosphate b) deoxyribose c) nitrogenous base d) glucose
 e) none of the answers is correct
17. The DNA molecule contains
 a) uracil b) ribose c) equal numbers of purines and pyrimidines
 d) equal numbers of cytosine and thymine e) none of the answers is correct
18. Meiosis
 a) occurs in all body cells b) produces diploid gametes
 c) involves two cell divisions d) is identical to mitosis in all respects
 e) none of the answers is correct
19. The human zygote produced during fertilization
 a) divides by meiosis b) starts its development in the ovary c) divides by mitosis
 d) is haploid e) none of the answers is correct

20. Most digestion occurs in the
 a) stomach b) small intestine c) large intestine d) gallbladder
 e) none of the answers is correct
21. The flap of tissue that prevents food from entering the trachea is
 a) soft palate b) hard palate c) vocal chord d) epiglottis
 e) none of the answers is correct
22. Which of the following proteins is involved in blood clotting?
 a) albumin b) gamma globulins c) fibrin d) hemoglobin
 e) none of the answers is correct
23. The human spinal column consists of the following vertebrae:
 a) 5 cervical 12 thoracic 7 lumbar 5 sacral and the coccyx
 b) 7 cervical 10 thoracic 7 lumbar 5 sacral and the coccyx
 c) 7 cervical 10 thoracic 5 lumbar 7 sacral and the coccyx
 d) 7 cervical 12 thoracic 5 lumbar 5 sacral and the coccyx
 e) none of the answers is correct
24. In 1 mm³ of human blood there are:
 a) 4 - 5 x 10⁹ erythrocytes b) 2.5 x 10⁶ thrombocytes
 c) 4 - 15 x 10³ erythrocytes d) 3 - 5 x 10³ leukocytes
 e) none of the answers is correct
25. The heart of a human adult at rest will pump into the pulmonary circulation in one minute:
 a) 0.5 L of blood b) 1.5 L of blood c) 5.0 L of blood
 d) 15.0 L of blood e) none of the answers is correct
26. Which of the following provides a direct source of energy for muscle contraction?
 a) lactic acid b) ATP c) glucose d) fatty acids
 e) none of the answers is correct
27. Which of the following statements on insulin, a pancreatic hormone, is *false*?
 a) it supports utilization of glucose b) it increases blood glucose level
 c) it is produced by β -cells of islets of Langerhans
 d) it is a protein released by the secretory pathway
 e) all the answers are correct
28. The human eye can perceive light waves in a range of:
 a) 400 - 600 nm b) 40 - 60 nm c) 400 - 750 nm d) 40 - 60 mm
 e) none of the answers is correct
29. All plant organisms inhabiting a particular region constitute:
 a) biocoenosis b) ecosystem c) zoocoenosis d) phytocoenosis
 e) none of the answers is correct
30. The hominids (the first humanlike primates) include which of the following?
 a) gorillas b) chimpanzees c) australopithecines
 d) dryopithecines e) none of the answers is correct