

## Cell Biology Exam 2

### SECTION A. MULTIPLE CHOICE. 20 MARKS

1. The biological potential of a given cell can be deduced from
  - A. Cell membrane
  - B. Cell nucleus
  - C. Cytoplasm
  - D. Mitochondria
  
2. The cell membrane phospholipid bilayer facilitates communication between :
  - A. Cytosol and cytoplasm
  - B. Nucleoplasm and cytosol
  - C. Cytoplasm and external cellular environment
  - D. Mitochondria and lysosome
  
3. During metaphase mitosis chromosomes
  - A. Undergo coiling
  - B. Move towards the poles
  - C. Line up at the equator
  - D. Break and disintegrate
  
4. Cylindrical cells make up the:
  - A. Simple epithelium
  - B. Squamous epithelium
  - C. Columnar epithelium
  - D. Cuboidal epithelium
  
5. In the cell cycle DNA synthesis takes place during
  - A. G1 phase
  - B. G2 phase
  - C. S phase
  - D. Prophase
  
6. RNA is directly involved in the synthesis of cellular:
  - A. Glycogen
  - B. Protein
  - C. Carbohydrate
  - D. Lipid
  
7. The production of mucous is a function of:
  - a. Squamous cells
  - b. Cuboidal cells
  - c. Ciliated cells
  - d. All Columnar cells

8. The position of the nuclei of columnar cells is:
  - A. Away from the basement membrane
  - B. Near the basement membrane
  - C. Distal to the basement membrane
  - D. Beneath the basement membrane
  
9. Endothelial cells line the:
  - A. Endocervical glands
  - B. Endothelium
  - C. Rectum
  - D. Body cavities
  
10. Sara would like to film the movement of chromosomes during cell division. Her best choice for a microscope would be a
  - A. light microscope, because of its oil immersion objective power.
  - B. transmission electron microscope, because of its magnifying power.
  - C. scanning electron microscope, because the specimen is alive.
  - D. transmission electron microscope, because of its great resolving power.
  
11. One of the following statements does not apply to wandering cells of connective tissue:
  - A. fibroblasts
  - B. monocytes
  - C. neutrophils
  - D. lymphocytes
  
12. Which of the following is not one of the CNS neuroglia?
  - A. schwann cell
  - B. astrocytes
  - C. microglia
  - D. oligodendrocytes
  - E. ependymal cells
  
13. Number of mitotic divisions required to produce 128 cells from a single cell is
  - A. 7
  - B. 8
  - C. 16
  - D. 32
  
14. Which of the following groups represent the basal domains of epithelial cells
  - A. Tight junctions, hemidesmosomes, and cilia
  - B. Flagella, cilia , and keratinization
  - C. Microvilli, cilia, conification
  - D. Junction complexes in general
  
15. What term is used to describe the death and removal of a cell that is no longer useful to an organism?
  - A. Epidermis
  - B. Apoptosis
  - C. Regeneration

D. Cytokinesis

16. A cell mutates when exposed to cigarette smoke. It does not stop dividing, does not stick to normal cells around it, and can move from one location of the body to another. What kind of cell is this?

- A. Replicating cell
- B. Cancer cell
- C. Normal cell
- D. Apoptotic cell

17. The cell theory is attributed to which of the following cell biologists

- A. Robert Hooke
- B. Martha Chase
- C. Theodore Schwann
- D. Gregory Mendel

18. Which of the following cells, with nuclear lobes in spectacle arrangement, plays an important role in parasitic reaction and allergic reactions

- A. Neutrophil
- B. Basophil
- C. Eosinophil
- D. Monocyte

19. The only flagellated epithelial cell in the human body is:

- A. Ciliated columnar
- B. Spermatozoa
- C. Ovum
- D. Goblet cell

20. Daughter cells are formed as a result of meiosis are not similar to that of parent cell because

- A. Meiosis is completed in two stages
- B. Prophase is longest phase
- C. Nucleus size increases in daughter cells
- D. Crossing over takes place and chromosome number is halved

## SECTION B

1. Using relevant examples, explain chromosomal variations (8marks)
2. Describe 8 cell processes indicating the organelle involved in each. (8marks)
3. Describe the mitochondrial genome (8marks)
4. Explain in general how a totipotent stem cell gives rise to the 260 different cell types in the human body (8marks)
5. Interphase was once viewed as a 'resting' phase of the cell cycle but is now known to be a period of many activities. Explain. (8marks)

## SECTION C

1. Describe the process of mitotic cell division (15marks)
2. Highlight 5 major differences between mitosis and meiosis (5marks)
3. Discuss epithelial cell specializations under the following subheadings :
  - a. Basal domains (10 marks)

b. Apical domains

(10 marks)