

# BITS Pilani, Dubai Campus

Dubai International Academic City, Dubai, UAE

1<sup>st</sup> Semester 2013-14 : Test-1 (Close Book)

Course No: BIOT F213

Date: 06.10.13 Duration 50 minutes

Course Title: Cell Biology

Weightage 25% Max Marks 50

*Answer all the questions*

*All sub questions should to answered together*

*Draw schematic diagrams wherever necessary*

**Q 1. a) According to the endosymbiotic hypothesis, what is the most likely explanation for the origin of the two mitochondrial membranes? Justify. (1+4)**

- Both inner & outer membranes were derived from folding of the prokaryotic plasma membrane.
- Both inner & outer membranes were derived from invagination of the eukaryotic plasma membrane.
- The inner membrane was derived from folding of the prokaryotic plasma membrane, and the outer from invagination of the eukaryotic plasma membrane.
- The inner membrane was derived from invagination of the eukaryotic plasma membrane, and the outer from folding of the prokaryotic plasma membrane.

**b) What is the Negative implication of endosymbiosis? (3)**

**Q2. List out the ways to generate new genes from preexisting genes (4)**

**Q3. How will you detect the presence of Mycoplasma in the cell culture? Explain its mode of infection. (3+5)**

**Q4. What is the significance of inverted microscope and mention its drawbacks? (3+5)**

**Q5. Briefly explain the important stages in histology slide production: (8)**

**Q.6 Write a short note on Cell-Adhesion (6)**

**Q.7 Tabulate three major forms of transport across the cell membrane with examples (9)**

	Type of transport	Explain the process	Example
1			
2			
3			

*"All the best"*

**BITS Pilani, Dubai Campus**

# BITS PILANI, DUBAI CAMPUS

FIRST SEMESTER 2013 – 2014

QUIZ – I (Closed Book)

Course No.: BIOT F213 Course Title: Cell Biology

Date: 20.10.2013 (Su2)

Time 20 minutes

Weightage: 08%

Maximum Marks: 16

Name: \_\_\_\_\_ Id No: \_\_\_\_\_

**Underline the most appropriate answer(s) from the given options.** (10 x ½ = 5)

**1) Which of the following statements concerning membrane proteins is incorrect?**

- A. They often require ATP to actively transport materials across the membrane against a concentration gradient
- B. They often facilitate diffusion of molecules across the membrane that otherwise would diffuse too slowly to be of use to the cell
- C. They can act as a channel, allowing the transport of ions across the membrane
- D. They may be receptor proteins that bind specific molecules from the surrounding solution, which triggers endocytosis (i.e., receptor-mediated endocytosis)
- E. They are usually not particular about what types of chemicals they will allow to cross the membrane

**2) What is the significance of selective permeability to biological membranes?**

- A. Selective permeability allows the plasma membrane to control traffic into and out of the cell it surrounds
- B. Selective permeability prevents toxic materials from entering the cell
- C. Selective permeability permits the selective uptake of nutrients and the elimination of wastes
- D. Selective permeability allows cells to concentrate particular ions on either side of the membrane
- E. All of the above are correct

**3) Which of the following types of transport does NOT require the use of a transport protein?**

- A. facilitated diffusion
- B. simple diffusion
- C. active transport
- D. both simple diffusion and facilitated diffusion

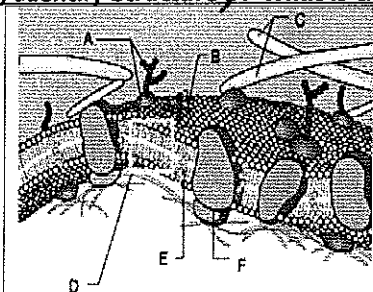
**4) What do you think would happen to an animal cell that was placed into a drop of 100% pure water?**

- A. The cell will swell up and eventually burst
- B. The cell will be unaffected by the pure water
- C. The cell will shrivel and shrink down
- D. The cell will be get into dormant condition

**5) Large food particles /whole organisms, can be engulfed & pulled into the cell by the process of .....**

- A. Receptor-mediated endocytosis
- B. Pinocytosis
- C. Phagocytosis
- D. Active transport

**6) Identify Structure D. What is the function of Structure E?**



**Identify**

- A. Glycoprotein
- B. Cholesterol
- C. Phospholipid bilayer of membrane
- D. Extracellular matrix
- E. Protein

**Function?**

- A. Transport across the plasma membrane
- B. Stabilization of the phospholipids
- C. Cell-cell communication
- D. Structural support of the cell
- E. Detection of environmental change

**7) Which of the following processes uses a difference in concentration (or concentration gradient) to transport molecules across the cell membrane?**

- A. Facilitated diffusion
- B. Simple diffusion
- C. Osmosis
- D. All of the above

8) Which of these cannot pass directly through the phospholipids of the plasma membrane?

The diagram shows a cross-section of a plasma membrane. The membrane is a phospholipid bilayer. Above the membrane is the extracellular space, and below is the cytoplasm. Four substances are labeled: A (lipid soluble molecule), B (glucose), C (water), and D (hydrogen ion).

- A
- B
- C
- D
- B, C & D

9) You know that this cell is in a(n).....solution because the cell.....

The diagram shows a cell in a hypertonic solution. The cell is shriveled, indicating it has lost water. The extracellular fluid has a higher concentration of solutes than the cytoplasm.

- A. Hypertonic ... lost water
- B. Hypertonic ... gained water
- C. Isotonic ... neither lost nor gained water
- D. Hypotonic ... shrunk
- E. Hypotonic ... swelled

- 10) A. Cell walls are found in plants, bacteria, fungi, algae, and some archaea  
 B. Cell walls are found in plants, bacteria, fungi, protozoans, and some archaea  
 C. Cell walls are found in plants, bacteria, animals, algae, and some archaea  
 D. Cell walls are found in plants, bacteria, fungi, algae, and some Echinodermata

**Fill in the blanks:**

(6 x 1 = 6)

- 11) Cell wall contains two groups of branched polysaccharides, \_\_\_\_\_ and \_\_\_\_\_
- 12) The resistive chemical which produces in response to a fungal/bacterial infection is \_\_\_\_\_
- 13) \_\_\_\_\_ is the Nickname of EPR because it \_\_\_\_\_
- 14) Peptidoglycan is a polymer consisting of sugars and amino acids that forms a mesh-like layer outside the plasma membrane of bacteria forming the cell wall which is also referred as \_\_\_\_\_
- 15) Muscle Endoplasmic reticulum is referred as \_\_\_\_\_ which stores \_\_\_\_\_ ions, released during muscle contraction, triggering the movement of the muscle
- 16) In the primary growing plant cell wall, the major carbohydrates are \_\_\_\_\_ , \_\_\_\_\_ & \_\_\_\_\_

**Answer in one line**

(5 x 1 = 5)

17) **Plasmodesmata:**

18) **Translocon:**

19) **Oxidative burst:**

20) **Important Economic products of cell wall –**

21) **Aquaporins**