

**Navrachana University**  
**School of Liberal Studies and Education, M.Sc Program**  
**End-Semester Examination November 2017**  
**First Year and Semester I**  
**Cell Biology and Biochemistry, LS107**

**Date: 24.11.17**

**Marks: 40**

**Time: 10:30 am – 12:30 pm**

***Important Instructions***

- 1. All the Questions are Compulsory**
- 2. Please read the questions carefully and answer accordingly**
- 3. Draw a neat and labeled diagram wherever necessary**

**Q.1 Do as directed:**

**(0.5x8=4 Marks)**

1. Synthesis of any protein in a cell determines:
  - a) types of ribosomes
  - b) mitochondria
  - c) sequence of nucleotides in DNA
  - d) sugar and phosphate of DNA
2. The presence of cholesterol in the plasma membranes of some animals
  - a) enables the membrane to stay fluid more easily when cell temperature drops.
  - b) enables the animal to remove hydrogen atoms from saturated phospholipids.
  - c) enables the animal to add hydrogen atoms to unsaturated phospholipids
  - d) makes the membrane less flexible, allowing it to sustain greater pressure from within the cell
3. The smooth endoplasmic reticulum is the site of \_\_\_\_\_.
4. Cholesterol is essential for normal membrane functions because it spans the thickness of the bilayer. True or false
5. Parasites that lives inside host body to get shelter and food are called
  - a) digestion parasites
  - b) synthetic parasites
  - c) endoparasites
  - d) ectoparasites
6. The fluidity of plasma membrane increase with
  - a) increase in saturated fatty acids in membrane
  - b) increase in unsaturated fatty acids in membrane
  - c) increase in phospholipid content in membrane
  - d) increase in glycolipid content in membrane
7. Which of the following statements about the electron transport chain is correct?
  - a) The electron transport chain is made up of a chain of electron carriers with decreasing electron affinity.
  - b) The electron transport chain is made up of a chain of electron carriers with increasing redox potential.
  - c) The electron transport chain is made up of a chain of electron carriers with decreasing oxidising power.
  - d) The electrons transferred from carrier to carrier in the electron transport chain gain energy.
8. When blood sugar falls glycolysis is halted in liver to allow
  - a) aerobic respiration
  - b) gluconeogenesis
  - c) anaerobic respiration
  - d) homeostasis

**Q. 2. Answer in one sentence**

**(1x8=8)**

1. Name the positively charged protein around which the negatively charged DNA wrapped.
2. State the difference between the structural genes in the transcription unit of prokaryotes and eukaryotes.
3. Which are the three classes of lipids found in biomembrane?
4. Which are the two enzymes that control the supercoiling in bacteria?
5. Why do you mean by infection?
6. Why higher energy phosphates bonds are favored in nature?
7. "Cell signaling reactions are interconnected with each other". Justify
8. Name any two cofactors used as vitamins with their structure.

**Q. 3. Answer in brief (Any 5)**

**(2x5=10)**

1. If a cell membrane were composed of only a phospholipid bilayer, what properties would it have?
2. Why are the majority of parasitic species described to date limited to just one or two host species?
3. What is the difference between a vector and a carrier?
4. Give the structure of FAD, FMN reduced forms.
5. What is biocytin? Give an example of it.
6. Why is meiosis important for the maintenance of the normal quantity of chromosomes in a species with sexual reproduction?

**Q4. Short notes (Any 2)**

**(3x2=6)**

1. Koch's postulates
2. Factors controlling growth of microorganisms.
3. Differentiate between paracrine, autocrine and endocrine mechanisms.

**Q.5. Answer in detail (Any 2)**

**(5x2=10)**

1. Explain briefly the steps involved in protein synthesis.
2. With the help of a labelled diagram describe the constituents of cell that belongs to angiosperm.
3. Elucidate the mechanism behind G-protein coupled receptor signaling.
4. Explain the signaling process of receptor tyrosine kinase with the help of example.

**Q6. Which process is more important for biological diversity, mitosis or meiosis?**

**(2)**

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