

Benha University
Faculty of science
Botany Dept.
Time : 2hrs
Total mark: 48 mark



3rd year medical entomology & Micr.
Physiology of fungi
27, Dec. 2016 (1st semestre)
Course code: B 363

All questions are to be attempted in sequence

Question I: Write short notes on two only of the following?

1. Environmental factors that influence fungi (*two only*)

Microbes are exposed to a wide variety of environmental factors that affect growth and survival. Microbial ecology focuses on ways that microorganisms deal with or adapt to such factors as *heat, cold, gases, acid, radiation, osmotic and hydrostatic pressures, and even other microbes*. Adaptation involves a complex adjustment in biochemistry or genetics that enables long-term survival and growth.

The totality of adaptations organisms make to their habitats is niche. For most microbes, environmental factors fundamentally affect the function of metabolic enzymes. Thus, survival is largely a matter of whether the enzyme systems of microorganisms can continue to function even in a changing environment. Select two factors only (temp., pH, oxygen and.....,etc)and speak on it.

2. Microbial enzyme

Enzymes are biological catalysts produced in living cells. They are proteinaceous in nature, the exception being catalytic RNA, which are also referred to as ribozymes. The term 'enzyme' is derived from the Greek, meaning 'in sour dough'. E. Buchner (1897) experimentally

proved that cell-free extract from yeast could produce alcohol from sugars, and he referred to it as “zymase”. The unique characteristics that enzymes possess are that they (1) increase the rate of reaction they catalyze, without being consumed or lost; (2) act specifically with the substrate to produce the products; and (3) remain regulated from a state of low activity to high activity and vice versa. Enzymes have been grouped into six classes based on the types of reactions they catalyze (Table 9.1). All cellular processes are controlled by a coordinated sequence of reactions that have specifically been catalyzed by a defined set of enzymes. Continue as in lecture and text book...

Question II: Clarify *two only* of the following?

1. Fungal growth curve

- Phases of fungal growth on a liquid shaker culture or surface culture is characterized by 3 stages

1- Phases of no apparent growth consist of two phases

- a- Lag phase: this stage is directly before spore germination
- b- Growing phase: cannot be measured by ordinary methods

2- Phase of rapid growth: in this phase of growth curve is almost straight line, this occurs at good environmental and nutritional conditions.

In case of filamentous fungi, not characterized by doubling of cell number as in case of unicellular (total count); but expressed by number of hyphal tips.

3- Phase of no net growth or autolysis: this phase is characterized by decreasing mycelia weight also appearance of N_2 & PO_4 in the

nutritional medium, that has leads to autolysis of the mycelium (the same mechanism in case of unicellular fungi). In deep

2. Essential nutrient in microbial metabolism (two only)

Are any molecular or elemental form of nutrient that is required by an organism.

Two categories of essential nutrients; macro-nutrients and micro-nutrients.

Macro-nutrients are needed in larger amounts. Used to help with cell structure and the cell's metabolism. Examples are proteins, and carbohydrates.

Micro-nutrients or trace elements are needed in a lot smaller amount.

They help enzyme function and help to maintain protein structure.

They include elements such as zinc, manganese, and nickel.

THE SOURCE OF COMMON ESSENTIAL NUTRIENTS ARE:
CHNOPS

1. Carbon
2. Hydrogen
3. Nitrogen
4. Oxygen
5. Phosphorous
6. Sulfur

Student should select two essential nutrient and explaine.

Good Luck