

الاسم:	مسابقة في الثقافة العلمية : مادة "الكيمياء"
الرقم:	المدة: ساعة واحدة

This Exam Includes Two Exercises. It Is Inscribed on Two Pages Numbered 1 and 2.
Answer the Two Following Exercises:

First Exercise (10 points) Alcoholism and Malnutrition

Heavy drinkers who get about half of their calories from alcohol cannot eat enough to obtain adequate vitamins and minerals....

Inadequate intake, poor absorption, increased vitamins destruction in the body, and urinary losses all contribute to vitamin deficiencies in the alcoholic. ...

Folate, thiamine, and vitamin A are most often affected by alcoholism. Folate deficiency contributes to malabsorption, anemia, and nerve damage-all of which worsen malnutrition. Vitamin A deficiency also creates a vicious cycle by damaging gastrointestinal epithelium and by compromising immunity, leaving the victim susceptible to infections. Thiamine deficiency contributes to classic diseases of alcoholism: the brain damage ..., the nerve inflammation, and the heart inflammation. Alcoholics can have overt scurvy from vitamin C deficiency. Vitamin B₆ and vitamin B₁₂ deficiencies are less common.

Alcohol metabolism competes with the normal metabolism of vitamins and other nutrients. For example, ethanol competes successfully with retinol for dehydrogenase. Retinol (vitamin A) can use that enzyme for its conversion to other active forms of vitamin A, and the disruption of its metabolism is probably one way alcohol increases cancer risk. The same disruption may produce birth defects when pregnant women drink.

Alcohol-induced fat malabsorption and metabolic abnormalities contribute to depletion of fat - soluble vitamins A, D, E, and K. Blood -clotting factors drop with depleted vitamin K, increasing risk of bleeding and anemia. Vitamin E deficiency is not generally recognized as a complication of alcoholism, but its depletion due to fat malabsorption is possible. Optimal vitamin E is necessary to quench free radicals generated during metabolism.

Alcoholics are commonly deficient in minerals such as calcium, magnesium, iron, and zinc. Alcohol itself does not seem to affect their absorption. Rather, fluid losses and an inadequate diet are the primary culprits....

Extracted from: Insel, P., Turner, R.E., Ross, D. NUTRITION. Jones and Bartlett publishers. 2002.

Questions

- 1- Referring to the passage, justify the statement: " alcohol is a food and a drug".
- 2- Pick up from the passage:
 - 2.1- An argument that justifies the following warning label that appears on containers of beer and wine: " ...women should not drink alcoholic beverages during pregnancy..."
 - 2.2- Two reasons that contribute to vitamin deficiencies in the alcoholic.
- 3- Indicate the class and the role of the two vitamins: thiamine and vitamin K.
- 4- Alcohol is prepared by the fermentation of grape juice. Give the name, the class and the molecular formula of the grape sugar.
- 5- Indicate how each of the following conditions is affected by alcohol abuse. Justify the answer.
 - 5.1- Osteoporosis (a condition in which loss of bone mass increases the risk of bone fracture).
 - 5.2- Anemia (a condition characterized with a low level of hemoglobin in blood).

Second Exercise (10 points)
Sertraline Hydrochloride (Marketed as “Zoloft”)

This is a summary of the most important information about “Zoloft”.

What Is “Zoloft”?

“Zoloft” is a medicinal drug used to treat: depression, obsessive-compulsive disorders, panic disorders, social phobia disorder....

Who Should not Take “Zoloft”?

Never take “Zoloft” if you are taking another drug used to treat depression, called a Monoamine Oxidase Inhibitor (MAOI), or if you had stopped taking an MAOI in the last 14 days. Taking “Zoloft” and MAOI at a limited time can lead to serious reactions, sometimes fatal, including: high body temperature, coma, and epilepsy.

What Are the Risks?

The major potential risks and side effects of “Zoloft” therapy are the following:

- Infant persistent pulmonary hypertension: babies of mothers who took a medicinal drugs of “Zolft” class, during 20 weeks or later in their pregnancies, had a greater risk (were 6 times as likely) to have persistent pulmonary hypertension (PPHN), than babies of mothers who did not take antidepressants during pregnancy. In addition, babies delivered of mothers taking “Zoloft” late in pregnancy have developed problems, such as difficulties in breathing and in eating.
- Bleeding problems: “Zoloft” may cause bleeding problems, especially if it is taken with aspirin, NSAIDs (non steroidal anti-inflammatory drugs, such as ibuprofen and naproxen), or other drugs that affect bleeding.
- Other side effects include nausea, diarrhea, difficulty in sleeping, dry mouth, sleepiness, weight loss, sexual problems and suicidal thoughts or actions.

Questions

- 1- “Zoloft” is supplied by oral administration as scored tablets containing 25, 50 and 100 mg of the active ingredient and the following inactive ingredients: magnesium stearate, sodium starch glycolate....
 - 1.1- Give the generic name of “Zoloft”.
 - 1.2- Specify the role of magnesium stearate.
- 2- Indicate why patients should be advised to notify their physician if they become pregnant or intend to become pregnant during “Zoloft” therapy.
- 3- A depressed patient treated with a MAOI(Nardil), complains about headache, hypertension, nausea and constipation, decides to take “Zoloft”. His physician notifies him that a wash out period of six weeks is required before the administration of “Zoloft”. Explain why.
- 4- Aspirin is an analgesic, and an anti- inflammatory medicinal drug.
 - 4.1- Define analgesic and anti- inflammatory medicinal drug.
 - 4.2- Give another common analgesic drug which can be taken without prescription.
- 5- “Zoloft” is a medicinal drug that must be taken only by prescription. Explain why.
- 6- Phenol barbitol, another medicinal drug used to treat depression, may cause a vitamin D deficiency.

Suggest a way to prevent this deficiency.

First Exercise (10 points)

Part of the Q	Answer	Mark
1	Alcohol is a food since the body uses it as an energy source. Alcohol is a drug because it modifies various body functions as: neurological disorders, birth defects, compromising immunity, and psychological disturbances.	2
2.1	The argument is that women should not drink alcoholic beverages during pregnancy because of the risk of birth defects such as neurodevelopment disorders and fetal alcohol syndrome (facial deformities, growth retardation, permanent brain damage, mental retardation and malformations in the skeleton or major organ systems).	0.5
2.2	The reasons that contribute to vitamin deficiencies in the alcoholic are: Inadequate intake, poor absorption, increased vitamins destruction in the body, and urinary losses.	1
3	Class: <ul style="list-style-type: none"> • Thiamin (vitamin B₁) is a hydrosoluble vitamin. • Vitamins K is a liposoluble vitamin. Role: <ul style="list-style-type: none"> • Thiamin prevents the brain damage, the nerve inflammation and the heart inflammatio. • Vitamin K: contributes to blood clotting and prevents hemorrhage... 	2
4	The grape sugar is glucose, it is a monosaccharide and its molecular formula is C ₆ H ₁₂ O ₆ .	1.5
5.1	Alcohol use increases the risk of osteoporosis since alcoholism contributes to vitamin A deficiency (vitamin A is important for proper bone growth) and vitamin D deficiency (vitamin D promotes calcium and phosphorus absorption and their fixation in bones) and calcium deficiency (calcium forms and maintains bones).	1.5
5.2	Alcohol use increases the risk of anemia since alcoholism contributes to iron deficiency (when iron is deficient hemoglobin cannot be produced) and vitamin K deficiency which increases the risk of bleeding and anemia.	1.5

Second Exercise (10 points)

Part of the Q	Answer	Mark
1.1	The generic name of "Zoloft" is Sertraline Hydrochloride.	1
1.2	Magnesium stearate is used to prevent the ingredients of "Zoloft" from sticking to be machinery used to compress the drug into tablets.	1
2	Patients should be advised to notify their physician if they become pregnant or intend to become pregnant during "Zoloft" therapy because babies delivered of mothers taking "Zoloft" late in pregnancy have developed problems, such as difficulty in breathing and eating and they have a higher chance (were 6 times as likely) to have persistent pulmonary hypertension (PPHN).	1.5
3	A wash out period of six weeks is required before the administration of "Zoloft" because taking "Zoloft" with MAOI at a limited period can result in serious reactions, sometimes fatal, including: high body temperature, coma, and epilepsy.	1
4.1	An analgesic is a medicinal drug used to reduce or eliminate pain. An anti inflammatory drug is a substance that reduces or eliminates inflammation.	1.5
4.2	Another analgesic drug which can be taken without prescription is: Panadol or Tylenol...	1
5	"Zoloft" is a drug that must be taken only by prescription, because the decision to administrate the medication should be made only after taking careful consideration of the potential benefits and risks of the medication for each individual patient.	2
6	The vitamin D deficiency can be prevented by consuming food rich in this vitamin such as liver, milk, and butter or by direct exposure to sunlight.	1