

1. As a result of an automobile accident, 50% of the muscle fibers in his biceps muscle of a patient were destroyed. Ten months later, the biceps muscle was able to generate 80% of its original force. Please describe the changes that took place in the damaged muscles enabled it to recover. (15 %).
2. After long-term and heavy training in jogging, a female athlete developed a series of reproductive abnormalities, such as alteration in fat deposition, menstrual cycle, basic body temperature, and ovulation. As an experienced nurse, please explain
  - a) why the athlete had those abnormalities. (10 %)
  - b) which symptom(s) mentioned previously would be cured if the woman were treated with synthetic estrogens and explain why (10%)
3. Women have about twice the incidence of gallstone formation as men. When larger gallstones appear in bile ducts, several gastrointestinal complications occur, such as fluid loss and diarrhea.
  - a. Explain how bile salts are formed (5%)
  - b. Illustrate enterohepatic circulation of bile salts. (5%)
  - c. Describe the regulation of bile secretion (5%)
  - d. Propose a mechanism to explain why women have higher incidence in

gallstone formation (5%)

e. Explain why gallstones in bile ducts causes fluid loss and diarrhea (5%)

4. A patient was suffered from bacterial infection and then complicated with renal dysfunctions, including uremia (urine in the blood), proteinuria (protein in the urine), anemia, lower limb edema, and hypertension. Based on the physiological functions of kidney, please explain why the patient had the symptoms of a) anemia (7%), b) hypertension (8%), and c) edema (10%)

5. Right after arriving the mountain higher than 10,000 ft, a young man ad developed mountain sickness, including breathlessness, pulmonary edema, and the impairment of mental process. Couple days later he had recovered from mountain sickness after adapting his life in the mountain.

a. Based on the respiratory functions, please explain why the patient had the symptoms of a) pulmonary edema (7%) and b) breathlessness (3%).

b. Please list 5 major mechanisms to explain how his body adapts to the condition of high altitude (15%).