

國立中央大學九十學年度轉學生入學試題

生命科學系 三年級 科目： 細胞學 共 1 頁 第 1 頁

(20%) 1. What is the cell cycle? What is the mitosis-promoting factor? The cell cycle of fat cells is stimulated by insulin-like growth factor I (IGF-I), but is inhibited by UV light. According to the signal transduction and the control of the cell cycle, answer the following questions.

- (a) Explain how IGF-I regulates the passes of the G1 checkpoint, G2 checkpoint and spindle assembly checkpoint.
- (b) Explain how fat cells defense their DNA damage and apoptosis formation caused by UV light.

(10%) 2. Give an example to describe the ways of how animal cells communicate with each other?

(20%) 3. Luteinizing hormone and testosterone are the glycoprotein and steroid hormones, respectively.

- (a) Describe how they are synthesized, processed and secreted inside and outside of the animal cells based on the endomembrane system.
- (b) Describe the mechanisms of how both hormones action on their target cells.

(20%) 4. What is the chemiosmotic model? Describe how ATP is produced in the mitochondria.

(20%) 5. Compare the properties of prokaryotic and eukaryotic cells in terms of size, membrane-bounded nucleus, organelles, cytoskeleton, exocytosis and endocytosis, cell division, genetic information, processing of RNA, ribosomes, and cell wall.

(10%) 6. Compare the properties of microtubules, microfilaments, and intermediate filaments in terms of structure, diameter, monomers, and functions.