

本試題是否可以使用計算機：可使用，不可使用（請命題老師勾選）

考試日期：0302，節次：3

請依題號順序於答案卷上作答，未依題序作答不予計分。

1. Please describe the signal hypothesis and the properties of uptake targeting sequences that direct proteins from the cytosol to organelles including nucleus, mitochondrion, peroxisome, and endoplasmic reticulum. (10%)
2. Please describe the molecular structures of signal recognition particle (SRP) and the translocation mechanisms involved in protein import into endoplasmic reticulum lumen. (10%)
3. Please describe the complete steps and important cell functions of the MAP kinase cascade. (10%)
4. Please define the epithelial-mesenchymal transition (EMT) and mesenchymal-epithelial transition (MET) phenotypes, as well as describe their biological significances in tumor metastasis. (10%)
5. Please describe the stages and processes of meiotic prophase I and the biological significances of meiosis, as well as the detailed processes of fertilization and the biological functions of cytosolic calcium wave. (15%)
6. Please describe the meaning and function of morphogen, asymmetric cell division, and maternal effect genes. (15%)
7. Please describe the characteristics of embryonic stem (ES) cells and tissue or organ-specific stem cells, as well as their developmental potencies and potential applications. (15%)
8. Please define the tumor-suppressor genes and oncogenes, as well as describe two mechanisms by which p53 acts to prevent a cell from becoming malignant. (15%)