

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）

1. Eukaryotic nuclei contain different kinds of RNA polymerases. Please specify what are these RNA polymerases including their nuclear localization, roles in transcription, responses to ionic strength and divalent metals. (20%)
2. Control of gene expression can be regulated at least at four different levels. Please propose one experiment for each of them to study the regulation of gene expression (20%)
3. One important biological effect of a large dose of ionizing radiation is to halt cell division. (15%)
 - A. How does this occur?
 - B. What happens if a cell has a mutation that prevents it from halting cell division after being irradiated?
 - C. What might be the effects of such a mutation if the cell is not irradiated?
4. Dynamic instability causes microtubules either to grow or to shrink rapidly. Please explain how this behavior occurs. (15%)
5. Please explain why eukaryotic cells require a nucleus as a separate compartment when prokaryotic cells can manage perfectly well without. (15%)
6. What do you suppose happens in mutant cells that (A) cannot degrade cyclins? (B) always express high levels of P21? (C) cannot phosphorylate Rb? (15%)