

考生注意事項：所有考題務必在答案卷上作答。凡在問題卷上作答者無效

一. 選擇題 (均為單選, 每題 2 分, 答錯倒扣 0.5 分)

1. Chloramphenicol is a useful reagent in studying cell biology because it inhibits the synthesis of
  - A. mRNA.
  - B. DAN by reverse transcriptase.
  - C. DAN by DNA polymerase.
  - D. protein in prokaryotes.
  - E. protein in eukaryotes.
2. Which method is used to assay chemicals for possible mutagenicity?
  - A. Southern blotting
  - B. Ames test.
  - C. Viscoelastic retardation technique.
  - D. Benign tumor test.
  - E. Northern blotting.
3. Animal cells from different species can be stimulated to fuse by infection with which virus?
  - A. Sendai virus
  - B. Adenovirus
  - C. Retrovirus
  - D. Reovirus
  - E. Poliovirus.
4. The processing of transfer RNA involves
  1. cleavage of extra bases from both the 3' and 5' end.
  2. nucleotide sequence-specific methylation of bases.
  3. addition of the sequence CCA by a nucleotidyl transferase.
  4. addition of a methylated guanosine at the 5'-end.

Answer

  - A. If 1,2 and 3 are correct.
  - B. If 1 and 3 are correct.
  - C. If 2 and 4 are correct.
  - D. If 4 is correct.
  - E. If all are correct.
5. During initiation of protein synthesis.
  - A. methionyl-tRNA appears at the A site of the 80 S initiation complex.
  - B. eIF-3 and the 40 S ribosomal subunit participate in forming the entry complex.
  - C. eIF-2 is phosphorylated by GTP.
  - D. a complex consisting of mRNA, the 60 S ribosomal subunit and certain-initiation factor is formed.
  - E. release incomplete polypeptide chains from the ribosome.
6. Which of the following statements about ras is INCORRECT?
  - A. Ras oncogenes have been detected in some human carcinomas.
  - B. The activated-ras protein typically contain a single amino acid change, usually at position 12.
  - C. In mammalian cells, the ras gene protein are located in nuclear matrix.
  - D. The normal ras protein involved in the regulation of adenylate cyclase.
  - E. Yeast also have ras-like gene.
7. Sister chromatids separate from one another occurs at what stages of meiosis.
  - A. Telophase I
  - B. Prophase II
  - C. Metaphase II
  - D. Anaphase II
  - E. Telophase II

二. 簡答題 (每題 3分)

Describe briefly the following terms:

8. Neurotransmitters
9. Radioimmunoassay
10. The sodium-potassium pump
11. Terminal cisternae
12. Photosystem I
13. Peptidoglycans
14. Signal hypothesis
15. Ionophores
16. Metastasis
17. Euchromatin
18. Svedberg units (S)
19. "Wobble" hypothesis
20. Plasmids

三. 問答題

21. (4%) For a given dosage of UV radiation, exposure to sunlight is far less damaging than exposure to a UV lamp, why do you suppose this is true?
22. (5%) What can a bacterium do to regain its optimal membrane fluidity when the growth temperature is changed from 37°C to 25°C.
23. (8%) Indicate the four stages of Mitosis in order and describe the major events occurring during each state.
24. (10%) Describe briefly the three major structural elements of the cytoskeleton and their functions.
25. (10%) Explain the difference between C<sub>3</sub> and C<sub>4</sub> plants, what is the advantage of being a C<sub>4</sub> plant?
26. (10%) Monoclonal antibodies can be produced from hybridoma tumors. Describe briefly the following:
  - (a) Basic principles of hybridoma technology.
  - (b) Important steps for generation of hybridoma cells for the production of desired antibodies.
  - (c) List two advantages of hybridoma technology over those conventional antibody production.