

香港中文大學
The Chinese University of Hong Kong

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二〇〇三至二〇〇四年度上學期科目考試
Course Examination 1st Term, 2003-2004

科目編號及名稱

Course Code & Title : BCH2010 Cellular Basis of Biochemistry

時間		小時	
Time allowed :	2	hours	分鐘
			minutes

學生編號	座號
Student I.D. No. :	Seat No.:

ALL answers should be entered **DIRECTLY** into the **ANSWER BOOKS**. Answer Part I and II in **SEPARATE ANSWER BOOKS**. Remember to **RETURN** the question paper together with your answer books.

PART I (60 marks)

Section A. True or false questions (10 marks): answer all questions (1 mark each).

NOTE: 1 mark will be deducted for each wrong answer.

True-False questions
not to be provided.

Section B. Short questions (30 marks): answer any 3 questions (10 marks each).

- B1. Briefly describe the cellular functions of microtubules.
- B2. Briefly illustrate, with examples, post-translational protein transport.
- B3. Briefly describe the roles of kinesins in intracellular transport.
- B4. Compare and contrast the various cell junctions mentioned in the lectures.

Section C. Essay questions (20 marks): answer either question.

- C1. (a) What will happen if COP-I coatomer is absence in the cell (10 marks)?
(b) Design an experiment to prove your hypothesis (10 marks).

OR

- C2. (a) What is Ran? According to the lectures, what is its role/s in eukaryotic cells (10 marks)?
(b) What will happen if Ran function is impaired in cells (10 marks)?

PART II (40 marks): Use a new answer book for this part.

1. Answer **any two** of the following questions. (20 marks)
- (a) Briefly describe the characteristics of signaling pathways mediated by receptor tyrosine kinase. (10 marks)
 - (b) How is cell cycle controlled in mammalian cells? (10 marks)
 - (c) What are the roles of calcium and calmodulin in cell signaling? (10 marks)
2. Answer **all** of the following questions. (4 marks each)
- (a) Why do signaling responses that require changes in proteins already present in the cell occur in milliseconds to seconds, whereas responses to stimulus that involve changes in gene expression usually require hours?
 - (b) Why do different types of cells respond in different ways to exactly the same signaling molecules even when they have the same receptors?
 - (c) How would the activity of a G protein be affected by a mutation that caused its affinity for GDP to be reduced without significantly changing its affinity for GTP?
 - (d) How is an IP₃-triggered Ca²⁺ response terminated?
 - (e) There are about 10¹³ cells in an adult human and about 10¹⁰ cells die and are replaced each day. Does this mean an adult human becomes a new person every three years?

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