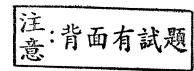
## 國立中央大學96學年度碩士班考試入學試題卷 共 2 頁 第 | 頁

# 所別:生命科學系碩士班醫藥與環境生物科技組(一般生)科目:細胞學

#### I. Single Choice: (80%, each for 4%)

1.	Overexpression	of	which	of	the	following	proteins	is	most	likely	to	induce	development	of
	cancer cells?									•			•	

- (A)P53
- (B) Ras
- (C) Rho
- (D) ABC transpoter
- (E) P21
- 2. Which structure specifies the location of cytokinesis in animal cells?
  - (A) Mitotic spindle
  - (B) Centromere
  - (C) Centrosome
  - (D) None of them
  - (E) All above
- 3. Which type of ion channels is mainly responsible for generation of the nerve impulse (action potential)?
  - (A) Voltage-gated K<sup>+</sup> channel
  - (B) Voltage-gated Na+ channel
  - (C) Voltage-gated Ca2+ channel
  - (D) Neurotransmitter-gated Na+ channel
  - (E) Neurotransmitter-gated Ca2+ channel
- 4. Which is the basic unit of eukaryotic chromosome?
  - (A) Centrosome
  - (B) Telomere
  - (C) Nucleosome
  - (D) Centromere
  - (E) Nucleolus
- 5. Which of the following description occurs in apoptosis?
  - (A) Cell shrink
  - (B) DNA fragmentation
  - (C) cytosekeleton collapses
  - (D) Activation of caspases
  - (E) All above
- 6. During mitosis, in which phase chromosomes are arranged in the center of mitotic spindle?
  - (A) Prophase
  - (B) Prometaphase
  - (C) Metaphase
  - (D) Anaphase
  - (E) Telophase
- 7. Which phase in the cell cycle is most likely to be affected by extracellular signals?
  - (A) Mitosis
  - (B) G<sub>1</sub> phase
  - (C) S phase
  - (D)G<sub>2</sub> phase
  - (E) G<sub>0</sub> phase
- 8. Which the following description about PDGF is NOT TRUE?
  - (A) Is a growth factor and mitogen
  - (B) Binds to receptor tyrosine kinase
  - (C) Induces myc production
  - (D) Activate PI3 kinase
  - (E) None of them



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- 9. Apoptosis can be induced by cytochrome C. Which organelles cytochrome C is released from?
  - (A) Nucleus
  - (B) ER
  - (C) Golgi
  - (D) Mitochondria
  - (E) Endosome

#### Questions 10-12 refer to the following descriptions.

- (A) Protein is pretranslational but unfolded
- (B) Protein is posttranslational and folded
- (C) Protein cotranslational but folded
- (D) Protein posttranslational but unfolded
- (E) Protein is cotranslational but unfolded
- 10. When protein is import into nucleus, which state of protein is in?
- 11. When protein is import into ER, which state of protein is in?
- 12. When protein is import into mitochondria, which state of protein is in?

#### Questions 13-16 refer to the following enzymes.

- (A) Cyclin-dependent kinase
- (B) Protein kinase A
- (C) Adenylyl cyclase
- (D) Caspases
- (E) Mitogen-activated protein kinase
- 13. Which enzyme is the key regulator of the cell cycle?
- 14. Which enzyme mediates apoptosis?
- 15. Which enzyme converts ATP to cyclic AMP?
- 16. Which enzyme can be activated by receptor tyrosine kinase?

#### Questions 17-20 refer to the following enzymes?

- (A)DAG
- (B) IP<sub>3</sub>
- (C) Cyclic AMP
- (D) Ras
- (E) Bcl
- 17. Which actives protein kinase A?
- 18. Which actives protein kinase C?
- 19. Which actives Mitogen-activated protein kinase?
- 20. Which activates calcium?

### II Questions: (20%, each for 10%)

- 1. The  $Na^+-K^+$  pump is important to maintain the Na and K ion concentration in the cytosol. How many Na and K ions are exchanged at each pumping cycle? And what is direction of ion flow? (10%)
- 2. Why do cells only replicate once per cell cycle? (10%)