

臺灣綜合大學系統 105 學年度學士班轉學生聯合招生考試試題

科目名稱	分子生物學	類組代碼	D24
		科目碼	D2492
※本項考試依簡章規定各考科均「不可以」使用計算機		本試題共計	3 頁
<p>分子生物學試題</p> <p>一、選擇題(單選)，每題二分，共三十題，計六十分。</p> <ol style="list-style-type: none"> The strand on which DNA replication is continuous is called the: (A) Leading strand (B) Lagging strand (C) Major strand (D) Minor strand When the gene pair in which both the maternal and paternal genes are identical (For example, RR or rr), it is called: (A) dominant (B) recessive (C) homozygous (D) heterozygous On a polypeptide, which amino acid cannot be phosphorylated? (A) serine (B) valine (C) threonine (D) tyrosine. Which of the followings is a stop condon? (A) UGG (B) UGA (C) UUA (D) AUG Which of the followings does not belong to core histones? (A) H1 histone (B) H2A histone (C) H3 histone (D) H4 histone In <i>E. coli</i>, DNA polymerase I does not have which of the following activity? (A) 5' to 3' polymerase activity (B) 3' to 5' polymerase activity (C) 5' to 3' exonuclease activity (D) 3' to 5' exonuclease activity. Which of the following is a true statement regarding DNA polymerase? (A) It is a processive enzyme (B) It contains proofreading activity (C) It requires a short primer or oligonucleotide to start synthesizing new DNA strands (D) All of the above Which of the following does not play a role in DNA replication? (A) DNA polymerase (B) Helicase (C) Single-stranded binding protein (D) Guanylyltransferase If you want to detect the RNA of a specific gene expressed in different tissues (heart, lung, brain, what technique would you use? (A) Southern blotting (B) Northern blotting (C) Western blotting (D) South-Western blotting In <i>E. coli</i>, which of the following protein is responsible for detecting mismatched DNA? (A) MutL (B) MutH (C) MutJ (D) MutS Which subunit of <i>E. coli</i> DNA polymerase III increases its processivity? (A) α (B) β (C) δ (D) γ Which of the following molecules is involved in DNA nucleotide excision repair? (A) RecBCD (B) MutH (C) UvrC (D) Spo11 			

背面有題，請繼續作答。

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<p>13. Which of the following components is not used during PCR? (A) DNA Polymerase (B) Oligonucleotide Primers (C) DNA Ligase (D) Template DNA</p> <p>14. The aromatic rings of the bases found in DNA and RNA absorb ultraviolet light with an absorption maximum at: (A) 240 nm (B) 260 nm (C) 280 nm (D) 300 nm</p> <p>15. Which of the following molecules is not involved in homologous recombination? (A) RecBCD (B) RecA (C) RuvA (D) UvrA</p> <p>16. The pre-miRNA was processed into miRNA by? (A) Dicer (B) Parsha (C) Argonaute (D) Drosha</p> <p>17. The CTD domain of RNA polymerase can be phosphorylated by which kinase during the <u>initiation</u> step of transcription? (A) TFIIB (B) TFIID (C) pTEFb (D) TFIIF</p> <p>18. Following the previous question, which kinase is involved in the <u>elongation</u> step of transcription? (A) TFIIB (B) TFIID (C) pTEFb (D) TFIIF</p> <p>19. Which enzyme is NOT involved in RNA editing? (A) exonuclease (B) endonuclease (C) deaminase (D) uridylyltransferase</p> <p>20. Which enzyme does play a role in polyadenylation of mRNA? (A) RNA ligase (B) RNA triphosphatase (C) Guanylyltransferase (D) Cleavage stimulation factor CstF</p> <p>21. What kind of amino acids are involved in the interaction with zinc iron of zinc finger proteins? (A) Serine and Threonine (B) Cysteine and Histidine (C) Asparagine and Glutamine (D) Aspartic acid and Glutamic acid</p> <p>22. Which protein contains the helicase activity in translation? (A) eIF4G (B) eIF4A (C) eIF4B (D) eIF4E</p> <p>23. Which protein complex for transcription does NOT contain TBP? (A) SL1 (B) TFIID (C) TFIIE (D) TFIIB</p> <p>24. Which transcription factor was NOT proved to be able of reprogramming somatic cells into embryonic stem cells? (A) c-Myc (B) TBP (C) Oct4 (D) Sox2</p> <p>25. Which sequence is the ribosome binding site in the prokaryotic transcript? (A) 5'-UTR (B) Kozak sequence (C) Shine-Dalgarno sequence (D) 3'-UTR</p> <p>26. In the infection of <i>E.coli</i> by λ phage, which protein could orchestrate the choice between lytic and lysogenic development? (A) cro (B) cI (C) cII (D) cIII</p>			

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<p>27. Which assay was used for identifying the interacting protein? (A) EMSA (electrophoretic mobility-shift assay) (B) Western blotting (C) CHIP (chromatin immunoprecipitation assay) (D) Yeast two-hybrid assay</p> <p>28. Which domain is NOT classified as the DNA-binding domain of a transcriptional activator? (A) Acidic domain (B) Homeodomain (C) Leucine zipper (D) Helix-loop-helix</p> <p>29. Which region of sigma factor of prokaryotic RNA polymerase can recognize the -10 region of promoter? (A) region 1.1 (B) region 2.3 (C) region 2.4 (D) region 4.2</p> <p>30. Which factor does NOT belong to the family of GTPase in translation? (A) IF2 (B) EF-G (C) EF-Ts (D) RRF (ribosome recycling factor)</p> <p>二、問答題，共四題，計四十分</p> <p>31. Please describe the functions of the following proteins: (2 points each) a. DNA glycosylase b. Spo11 c. RAG1 and RAG2 d. Helicase e. Telomerase</p> <p>32. Please describe the detailed process of homologous recombination in <i>E. coli</i> (10 points)</p> <p>33. Please describe the Trp attenuation of Trp operon in prokaryote. (8 points)</p> <p>34. Please compare the three eukaryotic RNA polymerases, including the gene products, the protein factors and the promoter regions. (12 points)</p>			