

考生姓名： _____

准考證號碼： _____

注意事項

請先確實填寫姓名及准考證號碼。

嘉南藥理科技大學九十五學年度碩士班暨碩士在職專班考試入學招生

生物技術概論試題(生物科技系碩士班一般生不分組) 本試題共 1 張 2 面

選擇題 30% (答案請填入答案欄)

1. A small, circular, double-stranded DNA molecule that is separate from the main bacterial chromosome is called a(n) _____.
(a) circulooid (b) nucleoid (c) plasmid (d) palmid (e) plummet
2. What is defined as a technique for producing large quantities of a specific DNA sequence? One can make millions of copies of recombinant DNA in a short period of time from one or a few initial copies.
(a) DNA reproduction (b) DNA cloning (c) DNA replication
(d) DNA transcription (e) DNA copying
3. What is the name of the process by which recombinant DNA gets into bacteria after being picked up from the surrounding medium?
(a) transduction (b) transmutation (c) transformation
(d) transjunction (e) transition
4. A(n) _____ is made from the total DNA extracted from nuclei and contains all of the DNA sequences of a species.
(a) genomic library (b) organismal library
(c) cDNA library (d) expressible library (e) RNA library
5. Which of the vector is commonly used for human genome project?
(a) yeast artificial chromosomes (b) λ phage
(c) Ti plasmid (d) SV40 viruse (e) plasmid
6. What structural feature of a dideoxynucleoside triphosphate prevents chain elongation once it has been incorporated into a growing polynucleotide chain?
(a) the missing oxygen at the 2'-carbon of the dideoxynucleoside triphosphate
(b) the missing oxygen at the 3'-carbon of the dideoxynucleoside triphosphate
(c) the 3 phosphates at the 5'-end of the dideoxynucleoside triphosphate
(d) the nitrogenous base of the dideoxynucleoside triphosphate
(e) the 3 phosphates at the 3'-end of the dideoxynucleoside triphosphate
7. The site on DNA to which RNA polymerases bind before initiating transcription is called the _____.
(a) terminator (b) operator (c) promoter (d) enhancer (e) silencer
8. Proteins that help RNA polymerase recognize promoters are called _____.
(a) transcription factors (b) translation factors
(c) elongation factors (d) proteases (e) a and c
9. 關於細胞週期的分析，何者正確：(a) 以螢光顯微鏡可以清楚的區分 G0 和 G1 期的細胞，但是不能區別 M 期的細胞 (b) 可將 DNA 以核酸染料染色後，再以流式細胞儀 (Flow cytometry) 分析 (c) 以 Flow cytometry 的分析方法可以清楚的區分出細胞正處於 G2 或 M 期 (d) 以上皆非
10. 關於 Enzyme-Linked Immunosorbent Assay (ELISA) 的敘述何者為非：(a) 利用抗體-抗原結合的原理 (b) Colorimetric 的呈色法敏感度高於 fluorescent 和 chemoluminescence 的呈色法 (c) Indirect ELISA 通常被使用來偵測抗體的存在，如 HIV 的感染 (d) Sandwich ELISA 方式可用來偵測及定量抗原的存在，如細胞激素的分泌量
11. RNAi 的 i 為：(a) Inhibition (b) Interference (c) Intervention (d) Immune
12. 下列關於 RNA 和 DNA 的萃取及純化敘述何者正確：(a) DNA 檢品的 260nm 吸光值/280 nm 吸光值在 1.6 為佳 (b) RNA 檢品的 260nm 吸光值/280 nm 吸光值在 1.8 為佳 (c) Spectrophotometer 定量法中，吸光值 (OD)=1.0 時代表 ss DNA (single stranded DNA) 為 40 $\mu\text{g/ml}$ (d) 常以乙醇作為 DNA 的萃取試液
13. PCR cycle 反應的順序為：(a) Denature \rightarrow Anneal \rightarrow Extension (b) Anneal \rightarrow Extension \rightarrow Denature (c) Extension \rightarrow Denature \rightarrow Anneal (d) Denature \rightarrow Extension \rightarrow Anneal
14. 下列何種方式常被應用蛋白質的定量：(a) The Modified Lowry Assay (b) BCA (bicinchoninic acid) assay (c) Bradford assay (d) 以上皆是
15. 鑄造 SDS-PAGE 時，Bis (*N,N'*-methylene-bis(acrylamide)) 的功能為：(a) 使蛋白質帶負電 (b) 使蛋白質帶正電 (c) 作為架橋劑，使 acrylamide 分子連在一起 (d) 作為助溶劑，使 acrylamide 溶解

答案欄

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	12.	13.	14.	15.					

<背面尚有題目>

配合題 I 12%

人名	貢獻或重大事件
1. Hershey and Chase ()	A. PCR
2. Woo Suk Hwang ()	C. DNA sequencing methods
3. Kary Mullis ()	D. Recombinant DNA technology
4. Gilbert and Sanger ()	E. Blender experiment-DNA is genetic material
5. Cohen, Boyer and Berg ()	F. First cloned puppy and faking data on human stem cell reserch
6. Watson and Crick ()	H. Discovered DNA double helix

配合題 II 10%

enzyme 名稱	主要參與反應
1. T4 polynucleotide kinase ()	A. DNA footprinting
2. T4 DNA ligase ()	B. to add phosphate to the ends of DNA
3. DNase I ()	C. Restriction endonuclease
4. Alkaline phosphatase ()	D. to join two DNA molecules together
5. EcoRI ()	E. to remove phosphate from the ends of DNAs

解釋名詞 20%

1. DNA cloning	
2. Primary culture	
3. Negative staining	
4. X-ray diffraction	
5. Yeast artificial chromosome	

問答題 28%

1. What is RT-Q-PCR? What are the **steps** and **key enzymes** involved in RT-Q-PCR?

2. Compare the differences in **sample**, **detection method** and **gel type** among **Southern**, **Northern** and **Western** Blotting.

3. a. Identify the open reading frame for the following nuclear encoded gene and show the amino acid sequence of the resulting polypeptide.

AAAUGACAAGACAAACUAAUUAACUAUGAC.....

b. What alterations in the coding sequence would allow expression of this nuclear gene in mitochondria?

Code	AGA	AGG	AUA	UGA
nuclear	Arg	Arg	Ile	Stop
Mitochondria	STOP	STOP	Met	Arg

First position (5' end)	Second position				Third position (3' end)
	U	C	A	G	
U	Phe	Ser	Tyr	Cys	U
	Phe	Ser	Tyr	Cys	C
	Leu	Ser	STOP	STOP	A
	Leu	Ser	STOP	Trp	G
C	Leu	Pro	His	Arg	U
	Leu	Pro	His	Arg	C
	Leu	Pro	Gln	Arg	A
	Leu	Pro	Gln	Arg	G
A	Ile	Thr	Asn	Ser	U
	Ile	Thr	Asn	Ser	C
	Ile	Thr	Lys	Arg	A
	Met	Thr	Lys	Arg	G
G	Val	Ala	Asp	Gly	U
	Val	Ala	Asp	Gly	C
	Val	Ala	Glu	Gly	A
	Val	Ala	Glu	Gly	G