

1. 生化自動分析儀檢驗報告中的血清指數 serum indices，通常包括 Hemolysis, Icterus, and Lipemia/Turbidity Indices (HIL indices), 這些指數在臨床檢驗上有什麼意義與用途? (6 分)
2. 請說明鎘 (Cadmium, Cd) (a) 對生物體的毒性 (b) 有那些檢驗的方法? (6 分)
3. 有關肌酸 (creatine), 磷酸肌酸(phosphocreatine), 肌酸酐(creatinine), 肌酸激酶(creatine kinase)
(a) 肌酸是在那些器官經由那些生化過程所合成? (5 分)
(b) 肌酸激酶可將肌酸催化成磷酸肌酸，是在那些器官或組織進行，這個反應有什麼生理意義? (5 分)
(c) 肌酸酐是如何產生的? (4 分)
(d) 肌酸酐可用化學法測定，請說明化學法名稱及測定試劑。(5 分)
(e) 肌酸酐也可用酵素法測定，請舉出一種酵素法測定機制，與化學法相比的優點及缺點。(4 分)
(f) 肌酸酐可套 MDRD 或 CKD-EPI 公式算出 estimated glomerular filtration rate (eGFR)，公式需要考慮到那些參數? 有什麼檢驗用途? (5 分)
4. What type of blood collection tube is preferred to use for testing blood glucose? Why? (5 分)
5. Chylomicrons are large lipoproteins. What is the function of chylomicrons? (5 分)
6. What is the most abundant protein in plasma/serum? How to measure it? (5 分)
7. Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the most common inborn error of metabolism in Taiwan. Please describe the diagnostic test for G6PD deficiency. (5 分)
8. The prenatal screening test for Down syndrome only requires a blood sample from the mother. What biochemical markers should be tested? (5 分)
9. What types of test can be done to confirm pregnancy? Please describe what specimens can be used and the methodology of pregnancy test. (5 分)
10. Method validation is an important process in a medical laboratory. At least several items should be evaluated including precision, accuracy, sensitivity, specificity, reference interval, and report range. Please describe how do you perform or design method validation experiments in these items? In addition, any other specific items should be also considered? (6 分)
11. Phase I and Phase II enzyme groups in the liver are important for drug metabolism. Please describe how phase I and phase II enzymes act in normal physiological metabolism? Your descriptions should contain what is the main purpose of phase I and phase II enzymes, what is the molecular action of phase I and phase II enzymes, and give an example for phase I and phase II enzymes. (6 分)
12. ADME is often mentioned in pharmacokinetics and TDM (therapeutic drug monitor). What is ADME and how ADME works in normal physiological condition? What is TDM and how ADME affects TDM? (6 分)
13. What is the physiological regulation of calcium? You may describe in several parts including how to maintain the homeostasis of blood calcium, what is the major hormone involved in calcium regulation, what is the major function of calcium, and how to measure blood calcium etc. (6 分)
14. You are working on a trial for evaluating a novel tumor marker in cancer diagnostics. The result is presented by a 2x2 table in below. Please calculate sensitivity, specificity, positive prediction value, and negative prediction value. Will you use this tumor marker in routine clinical patient tests? Why? (6 分)

		Clinical Diagnostics	
		With cancer	Without cancer
Tumor marker testing	Positive	900	900
	Negative	100	8100

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