系所組別：臨床藥學與藥物科技研究所乙組

考試科目：藥劑學 考試日期：0223，節次：1

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. A postapproval change is any change in a drug product after it has been approved for marketing by the regulatory authority. Postapproval manufacture changes may adversely impact drug product quality. Described the US-FDA definitions of level of changes that may affect the quality of an approved drug product. (8%)

2. What are the advantages and disadvantages of fixed-dose combination drug products? (12%)

3. A single 100-mg i.v. bolus dose of a drug that displays one-compartment disposition kinetics is given to a young man (aged 20years, 70 kg, glomerular filtration rate 120 mL/min). The plasma concentrations observed initially and 12 hours later are 10 and 2.5 mg/L, respectively. The cumulative urinary excretion of unchanged drug at 48 hours is 60 mg. The plasma protein binding of the drug is 80%.
   (1). Calculate the volume of distribution of the drug. (4%)
   (2). Calculate the elimination half-life of the drug. (4%)
   (3). What is the total clearance for this drug? (4%)
   (4). Estimate the renal clearance of the drug. (4%)
   (5). What is the probable mechanism for renal clearance for this drug? (4%)

4. Describe the mechanisms for a drug molecule to be absorbed in the gastrointestinal tract. Discuss how the physicochemical properties of a drug influence its absorption through different pathways. (10%)

5. Define nanotechnology and give two examples of its application in drug delivery. What advantages it may offer over conventional technology? (10%)

6. An animal study was conducted in rat to obtain the pharmacokinetic profile of a weak basic drug. Blood samples were withdrawn from the animal at different time points. Describe the general extraction procedures to purify the blood samples in order to analyze their plasma concentrations using high performance liquid chromatography. (10%)

（背面仍有題目，請繼續作答）

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7. Transporters are those proteins that carry either endogenous compounds or xenobiotics across biological membranes. They can be classified into either efflux or uptake proteins, depending on the direction of transport. Among them, P-glycoprotein (P-gp) is one of the transporters that interact with many drugs in widespread clinical use. P-gp has an important role in forming a protective barrier against absorption of xenobiotics in many tissues. Please choose where P-gp is (or are) expressed in. (5%)
   (A) Small intestine
   (B) adrenal gland
   (C) Liver
   (D) Blood-brain barrier
   (E) Spinal cord
   (F) Testes
   (G) Placenta
   (H) Pancreas
   (I) Colon
   (J) None of above

8. Also, please choose which P-gp inhibitors is (or are). (5%)
   (A) Verapamil
   (B) Tamoxifen
   (C) Gefitinib
   (D) Nifedipine
   (E) None of above

9. In addition to its tissue localization, the extent of P-gp expression of genes coding, the genetic polymorphisms of ABCB1 gene, can have a profound effect on the bioavailability and pharmacokinetics of various drugs. Please describe what pharmacogenomics is. (5%)

10. From application point of view, P-gp is an important issue in drug discovery, especially in brain drug delivery, since new drug candidates may be poorly absorbed and distributed, making them ineffective clinically. Please design and discuss a possible effective approach to overcome the barriers. (15%)