編號： 301

國立成功大學 105 學年度碩士班招生考試試題

系　　所：藥理學研究所

考試科目：藥理學

考試日期：0228，節次：2

※ 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。

Part I：50%

1. Receptors play important roles in the regulation of physiological functions. Please describe:
   (1) typical location
   (2) biological action
   (3) antagonists of the following receptors: (a) Muscarinic M_1; (b) $GABA_A$; (c) Histamine H_2　(15%)

2. Cardiovascular system disorders cause many types of disease. Describe the mechanism of action of the following drugs: (10%)
   (1) furosemide;　(2) clonidine;　(3) reserpine;　(4) propranolol;　(5) verapamil;
   (6) nitroprusside;　(7) losartan;　(8) thiazide;　(9) captopril;　(10) atorvastatin

3. Please describe and explain the mechanism of action and side effects of cisplatin and cetuximab used in cancer therapy. (5 %)

4. Please describe mechanisms involved in the regulation of anti-cancer drug resistance. (5%)

5. Drugs used in Parkinson's disease target on receptors, therefore, what types of autonomic side effects could be observed? (5%)

6. NSAIDs are useful for the treatment of mild to moderate pain, however, adequate control of more intense pain often requires treatment with an opioid. Please list strong, moderate and weak opioid drugs and what drug should be used in the event of an opioid overdose. (5%)

7. Aspirin and celecoxib are anti-inflammatory drugs. Please compare their action and potential cardiovascular risk. (5%)

Part II：50%

1. Please define the following terms <u>in details</u> (Total 10%):
   A. Pharmacy and Pharmacology (2%)
   B. Pharmacokinetics and Pharmacodynamics (2%)
   C. Pharmacogenomics (2%)
   D. Agonists and Antagonists (2%)
   E. Prodrugs (2%)

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2. Please describe the molecular mechanism of actions of Tamoxifen (Nolvadex®) and Trastuzumab (Herceptin®). In addition, please state the clinical applications of these drugs and potential adverse effects related to their usage in details. (10%)

3. Please describe the contractile motion of Segmentation contractions and Peristaltic wave contractions of the gut (intestine) in details and describe the molecular mechanism of actions of Loperamide (Imodium®) in terms of a contraction modulator of gut. (10%)

4. Please state the importance of the following stages during drug development and describe any types of data (properties of the compound) that can be determined at these stages (Total 10%):
   A. *In silico* analysis (2.5%)
   B. *In vitro* and *in vivo* studies (2.5%)
   C. Stage 1 and 2 clinical trials (2.5%)
   D. Stage 3 clinical trials (2.5%)

5. The successful rate of getting a single compound/drug into the market (*i.e.* from pre-clinical to clinical studies and finally approved by FDA) in the drug development process remains low (approx. 3%). Please give possible explanations for it. (10%)