

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

COURSE: PHA 4311 – SYSTEMS PHARMACOTHERAPEUTICS III

SUPPLEMENTARY EXAMINATION

AUGUST 2023

MARKS: 100

TIME: 3 HOURS

INSTRUCTIONS:

- **ANSWER ALL QUESTIONS**

SECTION A**[40 MARKS]**

1. In the following list; drugs are paired with clinical conditions. For each pair, describe why the drug would be **indicated** or **not indicated** in the corresponding paired condition. **[10 Marks]**
 - a. Levothyroxine sodium: obesity
 - b. Propranolol: thyrotoxic crisis + cardiac failure
 - c. Fludrocortisone: hypokalaemia
 - d. Ethinyl oestradiol: osteoporosis
 - e. Metyrapone: Addison's disease

2. Distinguish between the following: **[10 Marks]**
 - a. Secondary and primary hypogonadism
 - b. Central and nephrogenic diabetes insipidus
 - c. Addison's disease and Cushing's disease
 - d. Hashimoto thyroiditis and central hypothyroidism
 - e. Grave's disease and thyroid storm

3. In the following list; drugs are paired with possible adverse drug reactions (ADRs). For each pair, describe the mechanism underlying the ADR. **[10 Marks]**
 - a. Fluoxymestrone: gynaecomastia
 - b. Tamoxifen: hot flushes
 - c. Ketoconazole: impotence
 - d. Pitocin: water intoxication
 - e. Desmopressin: hyponatremia

4. Describe the clinical diagnostic test where each of the following drugs are used. **[10 Marks]**
 - a. Cosyntropin
 - b. Thyrotropin alfa
 - c. Sermorelin
 - d. Fludrocortisone
 - e. Dexamethasone

CNS DISORDERS PHARMACOTHERAPEUTICS**[50 Marks]**

1. A 43-year-old woman underwent dilation and curettage for abnormal vaginal bleeding. General anaesthesia was performed with desflurane. Desflurane has the lowest blood-gas partition coefficient of any inhaled anaesthetic agent.
 - a. What does the blood-gas partition coefficient determine? (4)
 - b. What would you expect in the above case given that desflurane has low blood-gas partition coefficient? (4)
 - c. If instead thiopental was used and the patient lost consciousness in 10 seconds and regained it 15 minutes later. What reasons would best explain why anaesthesia induced by standard dose of thiopental lasts 5 to 15 minutes? (2)

2. A 39-year-old woman was admitted to the hospital because of gripping and burning abdominal pain that increased over the past 4 hours. The patient was suffering from stage 4 ovarian cancer metastatic to the pelvis. A treatment with sustained release morphine was started.
 - a. What is the mechanism of action of the drug given? [2]
 - b. Describe the major adverse effects of morphine. [4]
 - c. Explain the main contraindications of morphine. [4]

3. A 7-year-old boy was described as 'dreamy' by his mother. He was making slow progress at school and his mother and teachers commented that he could not concentrate and had frequent episodes of staring vacantly for a few seconds, then carrying on as normal. Following an electroencephalogram (EEG) a synchronised electrical discharge characteristic of an absence form of epilepsy was demonstrated.
 - a. Which of the following would be suitable as a drug of first choice: phenytoin, phenobarbital, sodium valproate, ethosuximide? (2)
 - b. What are the major unwanted effects of the drug(s) you have chosen? (4)
 - c. If control of absence seizures is inadequate with your chosen antiepileptic, can combination therapy be given? (4)

4. A 19-year-old woman had a long-term history of epilepsy of the complex partial seizure type, which often gravitated to generalized seizures. For several years her epilepsy had been well controlled with a stable drug regimen. She now sought advice on contraception.
 - a. What antiepileptic drugs might be effective in the type of epilepsy this woman has? (2)
 - b. What suitable options are available for contraception? (2)
 - c. What potential problems can arise if the woman takes the combined oral hormonal contraceptives? (4)

- d. Would an injected progestogen contraceptive be worth considering? (6)
- e. If the combined oral hormonal contraceptive were the chosen method, what strategies should be adopted to ensure its efficacy? (4)
- f. Would the oral progestogen only contraceptive be suitable method of contraception? (2)

ENDOCRINE DISORDERS PHARMACOTHERAPEUTICS

[10 Marks]

1. A 33-year-old woman who had been unable to conceive a baby for 3 years started a controlled ovarian hyperstimulation treatment for in vitro fertilization.
 - a. Which drugs would most likely be administered daily to suppress the luteinizing hormone surge that could prematurely trigger ovulation? [5]
 - b. Describe at least two different mechanisms of action through which the drugs mentioned above work.[5]