

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

COURSE: PHA 4303 – CHEMOTHERAPY

SUPPLEMENTARY EXAMINATION

AUGUST 2023

MARKS: 100

TIME: 3 HOURS

INSTRUCTIONS:

- **ANSWER ALL QUESTIONS**

SECTION A**[40 MARKS]**

1. Describe the rationale behind the **concomitant administration** of the following drugs. State a possible therapeutic indication for each combination.

[10 Marks]

- A. Ampicillin + clavulanic acid
- B. Imipenem + cilastatin
- C. Ceftriaxone + gentamicin
- D. Sulfamethoxazole + trimethoprim
- E. Penicillin G + Probenecid

2. The criteria for combination therapy in cancer treatment include: **[20 Marks]**

- a) Each drug should be active as a single agent
- b) Each drug should have a different target within the cell
- c) Each drug should show different unwanted effects

Justify the use of following treatment regimens with regard to their ability to meet the above criteria? **[10 marks each]**

Regiment A: Non-Hodgkin's Lymphoma: (CHOP regimen) – cyclophosphamide, doxorubicin, vincristine and prednisolone

Regimen B: Testicular teratoma in an adult: intravenous etoposide, bleomycin and cisplatin

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. Doxycycline: *C. difficile* enterocolitis
- B. Piperacillin/Tazobactam Sodium: hypokalaemia
- C. Chloramphenicol: Grey baby syndrome in neonates
- D. Ciprofloxacin: joint pain/swelling
- E. Ethambutol: acute gout

SECTION B**[60 MARKS]****ANTIBACTERIAL AGENTS****[20 Marks]**

1. A 31-year-old man was found to be HIV positive and had high risk for Tuberculosis infection. A treatment with isoniazid was prescribed.
 - a. What is the mechanism of action of isoniazid? **[4]**
 - b. In dispensing this drug, what counselling points with regard to the side effects, their management and advice to increase the drug's effectiveness would you include? **[6]**

2. A 24-year-old woman came to the clinic with a sore throat and low-grade fever. Physical examination showed tonsil exudates and tender cervical adenopathy. A Gram stain of the tonsil exudate demonstrated the presence of a high number of bacteria. A diagnosis was made, and the pharmacist recommended treatment with penicillin G as he knew that the most offending pathogen was sensitive to the antibiotic.
 - a. What bacteria did the pharmacist believe most likely caused the patient's infection? **[3]**
 - b. Unfortunately, clinical history showed that the patient was allergic to penicillin and the physician prescribed oral clindamycin 450 mg 6 hourly.
 - i. What serious and potentially fatal complication could be developed with this drug therapy? **[3]**
 - ii. How could this complication be managed? **[4]**

CANCER CHEMOTHERAPY**[20 Marks]**

1. A 69-year-old woman with breast cancer is considered for adjuvant therapy with doxorubicin.
 - a. What factors should be considered before administration of this drug to this patient? **[5]**
 - b. Assuming after all assessments were done, the patient was found eligible to be given the drug and during administration extravasation occurred. How should this be managed? **[5]**

2. Two patients were undergoing chemotherapy treatment for different cancers at the oncology clinic in Maseru. One patient had acute lymphoblastic leukaemia (ALL) and had been prescribed high dose methotrexate 3g/m² and leucovorin to be given 24 hours after administration of methotrexate. The other patients had breast cancer and was prescribed 5-Fluorouracil IV 200 mg/m² to be given together with leucovorin. Explain the rationale behind administration of leucovorin in each of the patients. **[10]**

ANTIFUNGAL AND ANTIVIRAL DRUGS

[20 Marks]

1. A 42-year-old man with AIDS was admitted to the hospital because of a recent onset of tonic-clonic seizures. Physical examination suggested acute meningitis, and lab tests indicated cryptococcal infection. A treatment with amphotericin B and flucytosine was initiated but had to be suspended due to the appearance of severe adverse effects. An alternative treatment was initiated.
 - a. What adverse effects could be expected from the drugs mentioned above? [4]
 - b. Which drug could be the most appropriate as the new treatment initiated in the above case? [2]
 - c. Why would the drug in b. above be the most appropriate? [4]
2. A 43-year-old woman with AIDS started a highly active antiretroviral therapy with zidovudine, lamivudine, and atazanavir.
 - a. What is the rationale for triple therapy in AIDS patients? [4]
 - b. Describe the steps of viral growth cycle that are blocked by each drug above. [6]

END