



## SECTION A

### PART I - Multiple Choice Questions (30 Marks)

Choose the correct answer and write down the letter of the correct answer chosen in the Answer Booklet against the question number. E.g. 31 (c). Each question carries ONE mark. Any double writing, smudged answers or writing more than one choice shall not be evaluated.

1. Which of the following factors could be considered barriers to providing a thorough oral consultation to a patient?
  - I. Educational background
  - II. Primary language
  - III. Physical impairment
  - IV. Financial status
  - a. I, II and III only
  - b. I, II and IV only
  - c. I, III and IV only
  - d. II, III and IV only
  
2. The pharmacy department at a hospital has received approval for therapeutic interchange of Product A with Product B through both the Pharmacy and Therapeutics Committee. When Product A is ordered by a physician, the pharmacist may do which of the following?
  - a. Automatically interchange with Product B.
  - b. Only interchange products if approved by the patient.
  - c. Dispense Product B only after verbal approval from the physician.
  - d. Dispense neither Product A nor B until receiving approval from the physician.
  
3. A patient comes into the pharmacy with a new prescription for triamcinolone 0.1%. The pharmacy technician realizes that triamcinolone comes both as a cream and an ointment. The technician phones the physician's office to ask for clarification on the prescription. The nurse checks the patient's chart and tells the technician that the physician prescribed the ointment. Which of the following is the MOST APPROPRIATE action?
  - a. Do not fill the prescription because the physician was not notified.
  - b. Do not fill the prescription because the cream is most commonly dispensed.
  - c. Fill the prescription since the order was clarified by the technician.
  - d. Fill the prescription once the pharmacist clarifies the order with the physician.
  
4. In order to make a generic substitution, a pharmacist must do which of the following?
  - a. Notify the patient of the substitution.
  - b. Charge the same or lower price for the generic.
  - c. Place the brand name on the label and write "substitute for."
  - d. Obtain the physician's consent to substitute the Product

5. An order for phenytoin 300 mg IV is written. The pharmacy technician prepares this dose in 150 mL of D5W in a plastic bag and labels it to be infused over 10 minutes. Which of the following describes the error made by the technician?
- The diluent used should not have been D5W.
  - The admixture was not protected from light.
  - It was labelled with an incorrect infusion rate.
  - The solution was not placed in a glass container.
6. A patient brings in a vial of cloudy regular insulin. Examination of the medication profile reveals simultaneous use of NPH and regular insulin. Which of the following is the MOST PROBABLE explanation for the cloudy appearance of the regular insulin?
- The insulin has been improperly stored.
  - The insulin has expired.
  - The insulin has been contaminated.
  - The insulin is expected to be cloudy
7. An intern pharmacist asks the pharmacist about monitoring. Which of the following patient parameters should the pharmacist recommend monitoring when a patient is on metronidazole
- Lean body mass
  - Renal function
  - Pregnancy status
  - Alcohol intake
- 1 and 2 only
  - 1 and 4 only
  - 2 and 3 only
  - 3 and 4 only
8. Which of the following statement about Tramadol is true :
- Has beta blocking properties
  - Blocks noradrenaline reuptake
  - Has greater opioid activity than morphine
  - Only the +ve enantiomer is active
9. The most unlikely thing to occur with morphine administered in recovery is:
- Constipation
  - Respiratory depression
  - Nausea and vomiting
  - Physical dependence
10. Thiazide Diuretics:-
- Increase calcium excretion in the urine
  - Decreased efficacy in sodium depletion.
  - Main site of action is the proximal tubule.
  - Cause equivalent amount of diuresis to furosemide

11. Osmotic diuretics:
- Include mannitol and the dextrans
  - Wash out the medullary osmotic gradient
  - Cause sodium retention
  - Have a molecular weight >600
12. Frusemide does NOT cause:
- Hyponatremia
  - Hypokalemia
  - Hypouricemia
  - Hypocalcemia
13. The effects of beta blockers – the following is **not** true
- Relax uterine muscle
  - Increased AV conduction
  - Decreased lipolysis
  - Increased SVR
14. Regarding the plasma half-life of heparin:
- Clearance affected by warfarin
  - Depends on site of injection
  - Less for low MW heparins
  - Depends on dose given
15. Which statement about Paracetamol is true:
- Has an active metabolite
  - Interferes with renal blood flow
  - Does NOT cause gastric irritation
  - Causes methaemoglobinaemia
16. A decrease in renal function might be expected with which of the following drugs :
- Gentamicin
  - Cis-platin
  - Busulphan
  - All of the above
17. Which of the following causes dose dependent cardiac toxicity?
- Vincristine
  - Bleomycin
  - Danorubicin
  - All of the above

18. The principal mechanism of action of antidepressant agents is:
- Stabilization of dopamine and beta-adrenergic receptors
  - Inhibition of the storage of serotonin and epinephrine in the vesicles of presynaptic nerve endings
  - Blocking epinephrine or serotonin reuptake pumps
  - Stimulation of  $\alpha_2$ -norepinephrine receptors
19. Which of the following agents is related to tricyclic antidepressants?
- Clonidine
  - Amitriptyline
  - Fluoxetine
  - Isocarboxazid
20. Indicate the drug which increases absorption of iron from intestine:
- Cyanocobalamin
  - Folic acid
  - Ascorbic acid
  - Erythropoietin
21. Mechanism of aspirin action is:
- Converts inactive plasminogen into active plasmin
  - Inhibits COX and thus thromboxane synthesis
  - Enhances the interaction between antithrombin III and both thrombin and the factors involved in the intrinsic clotting cascade
  - Inhibits the glycoprotein IIb/IIIa complex
22. Sugar molecules in the structure of glycosides influence:
- Cardiotonic action
  - Pharmacokinetic properties
  - Toxic properties
  - All of the above
23. This drug is a Class II antiarrhythmic drug:
- Flecainide
  - Propranolol
  - Lidocaine
  - Verapamil
24. This drug is used intravenously to terminate supraventricular tachycardias:
- Nifedipine
  - Verapamil
  - Both of the above
  - None of the above

25. Angina pectoris is:
- Severe constricting chest pain, often radiating from the precordium to the left shoulder and down the arm, due to insufficient blood supply to the heart that is usually caused by coronary disease
  - An often fatal form of arrhythmia characterized by rapid, irregular fibrillar twitching of the ventricles of the heart instead of normal contractions, resulting in a loss of pulse
  - The cardiovascular condition in which the heart ability to pump blood weakens
  - All of the above
26. Which of the following nitrates and nitrite drugs is used for prevention of angina attack?
- Nitroglycerin, 2% ointment
  - Nitroglycerin, oral sustained-release
  - Isosorbide mononitrate
  - All of the above
27. This drug inhibits the angiotensin-converting enzyme:
- Captopril
  - Enalapril
  - Ramipril
  - All of the above
28. Carbapenems are effective against:
- Gram-positive microorganisms
  - Gram-negative microorganisms
  - Only bacteroid infections
  - Broad-spectrum
29. Mechanism of Streptomycin action is:
- Inhibition of cell wall synthesis
  - Inhibition of protein synthesis
  - Inhibition of RNA and DNA synthesis
  - Inhibition of cell membranes permeability
30. Tick the drug, inhibiting viral DNA synthesis:
- Interferon
  - Saquinavir
  - Amantadine
  - Acyclovir

**PART – II : Short Answer Questions (20 marks)**

**Answer ALL the questions. Each question carries 5 marks.**

1. Classify the antibiotics as per their therapeutic category.
2. What is hypertension? Classify the Anti-Hypertensive drugs with an example each
3. Write down the mechanism of action of Losartan and Enalapril.
4. As per the medicine act of the kingdom of Bhutan 2005, who are the members of the Medicine board and what are their powers?

**SECTION B**

**Case Study**

**Choose either Case 1 or Case 2 from this Section. Each Case carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**CASE 1**

Mr Dawa, a 59-year-old Business man is taken to A&E by his daughter due to increasing fatigue, weakness, confusion and drowsiness. Mr SA is 185 cm tall, weighs 83 kg and has a 15-year history of type 2 diabetes mellitus and hypercholesterolaemia. He is under the care of the diabetes clinic at the hospital for management of Charcot's arthropathy of the foot and diabetic foot ulcer. He also has a 5-year history of ischaemic heart disease and underwent coronary artery bypass grafting one year ago. He drinks half-a-bottle of red wine per day and smokes a pipe. He is allergic to penicillin. His current medications are:

- Metformin tablets 850 mg t.d.s.
- rosiglitazone tablets 4 mg b.d.
- atorvastatin tablets 40 mg o.d.
- amlodipine tablets 10 mg o.d.
- furosemide 40 mg o.d.
- aspirin 75 mg tablets o.d.
- gabapentin 600 mg tablets t.d.s.
- isosorbide mononitrate slow release tablets 60 mg o.d.
- glyceryl trinitrate spray sublingually 400–800 micrograms p.r.n.

On examination, he appears confused and disoriented and clinically dehydrated. He has an inflamed, malodorous foot ulcer with obvious purulent slough. Dorsalispedis and posterior

tibial pulses were palpable, suggesting adequate arterial supply to the foot. On close inspection, the wound is deep – penetrating to the ligaments and muscle – but a probe-to-bone test for osteomyelitis with a steel probe is negative. The area surrounding the ulcer appears cellulitic.

His vital signs are recorded as follows:

- heart rate 117 bpm
- temperature 38.8°C
- respiratory rate 23 breaths per minute
- blood pressure 92/59 mmHg
- oxygen saturation 96%.

A urine test indicates a urinary glucose of >25 mmol/L but is negative for nitrites and leucocyte esterase.

### Questions

1. What are the signs and symptoms of foot infection in diabetic patients and when are antibiotics indicated? (5 marks)
2. What are the likely pathogens? (5 marks)
3. What are the primary issues to be considered when choosing empirical anti-infective therapy in this case? (4 marks)
4. Comment on the choice of anti-infective regimen in this case and discuss alternative regimens. (4 marks)
5. Critically appraise the management options in this case. (3 marks)
6. Outline a pharmaceutical care plan for this patient with infected diabetic foot ulcer including advice to the clinician. (4 marks)
7. What are the goals of therapy in diabetic foot infection? (3 marks)
8. How should therapy be monitored? (2 marks)
9. What are the prognosis and potential long-term complications of diabetic foot ulcers? (5 marks)
10. What are the relevant pharmacy issues in this case, including lifestyle issues? (5 marks)
11. What is the mechanism of action of furosemide? (5 marks)
12. List down two drugs available on EDL used to treat NIDDM. (5 marks)



## **CASE 2**

A 70-year-old woman, reports to the hospital because she has been feeling very tired. She informs that she has been getting out of breath when walking up stairs which she never had any problem with in the past. On examination, she has pallor of the skin, conjunctiva and nail beds and brittle nails. She is a strict vegetarian. The Nurse performs a blood count and the results show that she has iron deficiency anaemia.

### **Questions**

1. What is anaemia? (2 marks)
2. What typical blood results might you expect in a patient with iron-deficiency anaemia? (5 marks)
3. What symptoms does the patient have that support the diagnosis of iron-deficiency anaemia? (5 marks)
4. What risk factors does the patient have for developing this condition? (3 marks)
5. What is erythropoiesis and which human growth factor stimulates this? (4 marks)
6. Describe the life cycle of a red blood cell, starting from the release of erythropoietin and ending with its destruction. (5 marks)
7. Should modified-release iron preparations be used in the treatment of anaemia? Justify your answer. (3 marks)
8. What are the side-effects of iron preparations? (4 marks)
9. What medication would you recommend for the patient? (Give a preparation, dose and frequency.) (5 marks)
10. How would you counsel the patient about the medication you have recommended? (5 marks)
11. What follow-up should the patient receive? (4 marks)
12. The patient tells you that she takes magnesium trisilicate for her indigestion when you ask about any other medicines. Can she continue to take this? (5 marks)