



**All India Institute of Medical Sciences, Kalyani**  
**Second Professional MBBS Examination, February 2024**

**Time: 3 Hrs.**

**Pharmacology (Paper-II)**

**Marks: 100**

- Answer all questions.
- Answer the questions in the same serial order strictly.
- Illustrate your answers with well labelled diagram wherever necessary.
- Answer each section in a separate answer book.

**SECTION – A (50 MARKS)**

**Long answer question:**

**[1+3+2+2+2=10]**

1. A patient aged 55 years suffering from type 2 diabetes mellitus was on metformin (1000 mg daily) and glibenclamide (5 mg/day) for the last 6 months. The patient is obese (BMI: 32 kg/m<sup>2</sup>) with a history of hypertension for which he was taking tablet ramipril 2.5 mg/day. His most recent HbA1c level was 8.5%. His renal function and ECG were within normal limits.
  - a. What would be the desirable level of HbA1c for the patient?
  - b. What should be the future treatment plan to improve glycaemic control?
  - c. Comment on the choice of antihypertensive for the patient.
  - d. What are the common adverse drug reactions of metformin?
  - e. Enumerate the antidiabetic drugs which causes weight gain and weight loss.

**Write Short notes on:**

**(8×5=40)**

2. A 48-year-old man presents for evaluation of heartburn. He reports a burning feeling in his chest after eating. It is worse when he eats spicy foods or tomato sauce. He is sometimes awakened at night with these symptoms. He has tried over-the-counter antacids and histamine H<sub>2</sub> blockers with partial relief. An upper gastrointestinal (GI) x-ray series reveals gastroesophageal reflux disease (GERD).
  - a. Along with appropriate diet and lifestyle modification recommendations, name two first-line drugs which could be prescribed in GERD? (2+3)
  - b. Explain the mechanism of action of ONE such agent in GERD?
3. An 8-year-old boy is brought to your office because of a chronic cough. His mother says that he coughs frequently throughout the day and will have symptoms 2 or 3 nights a month as well. This has been a problem on and off for approximately a year, but seems to be worse in the spring and fall. He also coughs more when he is riding his bike or playing soccer. He has been treated twice in the past year for "bronchitis" with antibiotics and cough suppressants but he never seems to clear up completely. His examination is normal except for his lungs, which reveal expiratory wheezing. You diagnose him with asthma and prescribe an albuterol inhaler. (2+1+2)
  - a. Explain the mechanism by which albuterol will be of benefit in this patient.
  - b. State TWO common side effects of albuterol.
  - c. Explain why long-acting  $\beta_2$  agonists should not be used in an acute attack of bronchial asthma.
4. A 66-year-old woman with osteoporosis is prescribed alendronate. (3+2)
  - a. What is the mechanism of action of parathyroid hormone (PTH) on the bone and in the kidney?
  - b. Explain the mechanism by which alendronate will be of benefit to this patient.
5. Write a note on:- (3+2)
  - a. Oral direct thrombin inhibitors
  - b. Enumerate oral and parenteral Iron preparations
6. Write a note on:- (3+2)
  - a. Pharmacotherapy of Crohn's disease – enumerate the drugs with brief mechanism of action.
  - b. Penicillamine – use and adverse effects
7. Explain why:- (2.5+2.5)
  - a. Inhalational corticosteroids are considered mainstay of maintenance therapy for bronchial asthma
  - b. LMW Heparin is often preferred over Unfractionated Heparin

8. Briefly discuss:- (2.5+2.5)
- Vitamin K Antagonists (Example, Use, ADR)
  - Tacrolimus (Mechanism, Use)
9. Mention group and one clinical use of following drugs:- (1+1+1+1+1)
- Atorvastatin
  - Sitagliptin
  - Octreotide
  - Pyridoxine
  - BAL

**SECTION - B (50 MARKS)**

**Long answer question:**

**[2+4+2+2=10]**

1. A 28-year-old woman has surgery due to perforated appendicitis with peritonitis. Post-operatively, she had received a continuous parenteral antibiotic (clindamycin). On the tenth post-operative day she developed fever, tachycardia, tachypnea, abdominal cramping, and diarrhea with pus and mucus. Laboratory investigations revealed the following:
- CBC: Leukocytosis
- Stool culture: Gram +ve rods (*Clostridium difficile*); Presence of toxins in stool
- Imaging: Sigmoidoscopy revealed mucosal hyperemia, ulcers, and pseudomembranes
- Name the clinical condition which the woman is most likely suffering from.
  - Explain the development of this clinical condition.
  - What antibiotic treatment would you institute in this case?
  - Name TWO monoclonal antibodies which could be administered to counter the pathophysiology of this clinical condition, viz., neutralize the toxins in stool.

**Write Short notes on:**

**(8×5=40)**

2. Compare and contrast the following:- (2.5+2.5)
- Time Dependent and concentration Dependent killing
  - First Generation and Third Generation Cephalosporins
3. Select appropriate drug in the following scenario:- (1+1+1+1+1)
- A 36-year-old male suffering from chickenpox
  - A 28-year-old male suffering from kala-azar (Visceral Leishmaniasis)
  - A 17-year-old girl suffering from MRSA Skin infection
  - A 20-year-old female pregnant patient suffering from Toxoplasmosis
  - A 36-year-old male suffering from Type 2 Leprosy Reaction
4. Discuss the rationale of combining the following drugs:- (2.5+2.5)
- Amphotericin B with flucytosine
  - Piperacillin with tazobactam
5. Write a note on:- (3+2)
- Pharmacotherapy of influenza disease.
  - Pharmacotherapy of people living with HIV (adults) as per NACO guidelines
6. A 45-year-old patient is diagnosed with lymphoma and was prescribed cyclophosphamide. Explain the mechanism of action, adverse effects and monitoring parameters to be considered during the therapy. (5)
7.
  - Discuss the clinical significance of Fast and slow acetylators of Isoniazid. (2.5)
  - Discuss pharmacotherapy of Multidrug resistant tuberculosis (2.5)
8. Discuss common toxicities with anticancer drugs and the drugs used to ameliorate / minimize / prevent the toxicities. (5)
9. Write the mechanism of action of below drugs:- (1+1+1+1+1)
- Doxorubicin
  - Vincristine
  - Cisplatin
  - Trastuzumab
  - Bevacizumab