

**MBBS 2<sup>nd</sup> PROFESSIONAL EXAMINATION, 2022****PHARMACOLOGY****Paper I****Time Allowed: Three Hours****Maximum Marks- 100**

**Note:** Attempt all questions in serial order. Answer Section-A and Section-B in separate answer books. All parts of a question should be answered together. Illustrate your answer with suitable diagram where required. Figures in parenthesis indicate marks allotted to a question.

**Section-A**

- Q1.** Sunita, a 60-year-old female presented for routine ophthalmic examination. Her visual acuity without correction was 6/12 (right eye) and 6/24 (left eye). Tonometry measured an intra-ocular pressure (IOP) of 30 and 36 mm Hg in the eyes. Ophthalmoscopy revealed physiologic cupping of the optic discs and visual field defects consistent with glaucoma. Both pupils were normal, and gonioscopy indicated that anterior chamber angles were normal. There was no sign of cataract formation. She revealed a family history of glaucoma. Findings on examination indicate that she has primary open-angle glaucoma (POAG).
- a) What factors may predispose Sunita to an increased IOP? (2) 1
  - b) List the classes of drugs used to treat her condition, giving examples. (5) 3
  - c) Briefly explain the mechanisms by which drugs can lower IOP? (5) 2
  - d) What is the therapeutic objective in this patient? Select your P-Drug and P-Treatment. (6) 3
  - e) What patient instructions are required if an appropriate ophthalmic eye drop is prescribed? (2) 1
- Q2.** Write briefly on: (4x5)
- a) Factors affecting Bioavailability. 3
  - b) Phases of Clinical Trials. 2
  - c) Advantages of Atenolol over Propranolol. 2
  - d) Rationale of using pralidoxime in organophosphate poisoning 3
- Q3.** Multiple Choice Questions: (10x1)
1. Class of drugs which cannot be purchased over the counter without prescription comes under which SCHEDULE according to the Drugs and Cosmetics Rules in India:
    - a) P
    - b) H ✓
    - c) Y
    - d) M
  2. Paracetamol is completely absorbed orally; 25% bound to plasma proteins, widely distributed in the body (volume of distribution ~ 1L/kg); extensively metabolized in liver and has a plasma half-life ( $t_{1/2}$ ) of 2-3 hours. Which of the following aspect of paracetamol is being described by these statements?
    - a) Pharmacodynamics
    - b) Clinical Pharmacology
    - c) Toxicology
    - d) Pharmacokinetics

3. Ram, a 20-year-old male complains of dizziness, breathlessness, intense itching immediately after receiving injection of benzathine penicillin. His BP was 80/60 mm of Hg. What type of adverse drug reaction is this?
  - a) Type A
  - b) Type D
  - c) Type B
  - d) Type C
4. When does a company seek permission to market a drug by applying New Drug Application?
  - a) Following the completion of preclinical study
  - b) Following the completion of Phase 1
  - ☒ c) Following the completion of Phase 3
  - d) Following the completion of Phase 4
5. A 30 year old female was diagnosed with primary syphilis and subsequently prescribed penicillin G 2.4 million units intramuscularly (IM). few hours of taking 1st injection, the patient developed breathlessness, bronchospasm, wheezing and hypotension. Which dose of adrenaline should be administered in this patient?
  - a) 5 mL of 1:1000 strength intramuscularly
  - ☒ b) 0.5 mL of 1:1000 intramuscularly
  - c) 1 mL of 1:1000 IV
  - d) 0.1 mL of 1:1000 IV
6. The following cotransmitter is most probably involved in mediating nonadrenergicnoncholinergic (NANC) relaxation of the gut:
  - a) Neuropeptide Y (NPY)
  - b) Adenosine
  - c) Nitric oxide (NO)
  - d) Kallidin
7. During a routine retinoscopic examination, the ophthalmologist wanted to dilate the pupil of the patient using a drug. Which of the following drugs should be most likely used?
  - a) Acetylcholine
  - b) Pilocarpine
  - ☒ c) Tropicamide
  - d) Bethanechol
8. A 80-year-old hypertensive male is suffering from urinary symptoms due to his enlarged prostate. Which of the following  $\alpha$ -adrenergic blockers would you suggest in this patient?
  - a) Prazosin
  - b) Doxazosin
  - c) Phentolamine
  - ☒ d) Tamsulosin
9. A 25 year old newly married woman, Mamta, was on oral contraceptive pills. She presented to a community physician with complaints of amenorrhoea and her urine pregnancy test was found to be positive. On history taking, it was found that she was suffering from epilepsy and taking tablet phenytoin for control of seizure. What is the likely cause of oral contraceptive failure?
  - a) Phenytoin increases excretion of OCPs
  - b) Phenytoin increases metabolism of OC Pills
  - c) Phenytoin increases the blood level of OC Pills
  - d) Phenytoin is not responsible for OCP failure
10. A 78 year-old woman has been taking an anti-glaucoma eye drop for the past 20 years. The pressures in both eyes measure 18 mmHg. Examination reveals the presence of black deposits in the lower tarsal conjunctiva of both eyes. What medication is she likely to be on?
  - a) Brimonidine
  - b) Dipivefrin
  - c) Timolol
  - d) Travoprost



## Section-B

- Q1. A 20-year-old female complains of severe throbbing headache in the left side of her head since yesterday. She also complains of nausea and photophobia. She also vomited once in the morning. She has been having such attacks frequently, in the past six months for which she used to take paracetamol. The patient is grossly incapacitated during the attack. Her ocular and neurological examination is normal. All investigations are within normal range. 11
- What is the most likely cause for her recurrent headache? (2) 1
  - Discuss the pathophysiology of the condition and the mediators involved. (2) 2
  - What are the various drugs that can be given to treat this patient? Briefly explain the mechanism of action of each drug. (5) 3
  - What is the therapeutic objective in this patient? Select your P-Drug and P-Treatment. (6) 3
  - Name the prophylactic drugs to prevent the recurrence of such attacks, after the patient has recovered from this acute attack. (5) 4
- Q2. Write short notes on: (4x5)
- Compare and contrast between tubocurarine and succinylcholine. 2
  - Advantages of Benzodiazepines over Barbiturates as sedatives. 2
  - Pharmacological basis of use of low dose aspirin in management of post MI patients. 2
  - Pharmacological management of acute severe asthma with mechanism of action and adverse effects of each drug. 3
- Q3. Multiple Choice Questions: (10x1)
- A 43 year old heavy machine operator complains of seasonal allergies. Which medication is most appropriate for management of his allergic symptoms
    - Diphenhydramine
    - Doxylamine
    - Hydroxyzine
    - ☒ Fexofenadine
  - Physician prescribed one NSAID to a patient with acute gout because it has additional potent inhibitory effect on leucocyte migration. Identify that NSAID.
    - Fenoprofen
    - Flurbiprofen
    - Naproxen
    - Ibuprofen
  - A patient is diagnosed with hypothyroidism and levothyroxine 50 microgram has been recommended. What would be appropriate timing of drug intake in this patient?
    - After breakfast
    - After dinner
    - Before breakfast in empty stomach
    - Any time after meals
  - A 50 year old male, sadhu, is having acromegaly with a large pituitary tumour. Surgical resection of tumour is advised with pharmacological therapy. Which among the following medicines is most likely to be prescribed?
    - Somatropin
    - Octreotide
    - Leuprolide
    - Desmopressin
  - Which among the following  $\beta_2$  agonists is given by inhalational route and is suitable for both terminating acute attack of asthma as well as for prophylaxis?
    - Terbutaline
    - Bambuterol
    - Salmeterol
    - Formoterol



6. A pulmonologist decides to prescribe zileuton to a patient suffering from asthma. The mechanism of action of this drug is-
- Antagonize leukotriene D4 receptors
  - Inhibits 5-lipoxygenase
  - Inhibit phosphodiesterase
  - Stimulate  $\beta_2$  receptors
7. A 39-year-old carpenter has taken two bottles of liquor from the local shop. After about an hour, he develops confusion, vomiting and blurring of vision. He has been brought to the emergency department. Which among the following drugs should be given as antidote?
- Naloxone
  - Diazepam
  - Flumazenil
  - Ethyl alcohol
8. Incision and drainage was planned for an abscess, anesthetist injected local anesthesia around the abscess, 10 minutes later surgeon gave incision and patient cried in pain. What could be the reason for local anesthesia failure?
- Blood flow to inflamed area is decreased so that drug slowly reaches the nerve terminals
  - Drug metabolizing enzymes are very high
  - They are rich in extracellular  $K^+$  which lowers the drug receptor binding
  - They have a low extracellular pH, which hinders drug diffusion into the cell
9. The minimal alveolar concentration of an inhalational anesthetic is a measure of
- Therapeutic index
  - Potency
  - Efficacy
  - Diffusibility
10. Which of the following opiates is associated with seizures when given in high dose to patients with renal failure?
- Pethidine
  - Morphine
  - Codeine
  - Methadone

\*\*\*\*\*