



UNIVERSITI KUALA LUMPUR  
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

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**FINAL EXAMINATION**  
**MARCH 2025 SEMESTER**

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COURSE CODE : HDB20203  
COURSE TITLE : HUMAN PHARMACOLOGY  
PROGRAMME NAME : BACHELOR OF BIOMEDICAL SCIENCE (HONOURS)  
DATE : 04 JULY 2025  
TIME : 9:00AM - 12:00PM  
DURATION : 3 HOURS



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**INSTRUCTIONS TO CANDIDATES**

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1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet.  *Tick if applicable*
9. Refer to the attached Formula/ Appendies.  *Tick if applicable*

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THERE ARE 16 PAGES OF QUESTIONS INCLUDING THIS PAGE

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## SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

1. Which one of the following drugs, when administered intravenously, can decrease blood flow to the skin, increase blood flow to skeletal muscle, and increase the force and rate of cardiac contraction?
  - A. Acetylcholine
  - B. Epinephrine
  - C. Pilocarpine
  - D. Carbachol
  
2. Which of the following statements best describes tolerance in the context of drug addiction?
  - A. The set of physical and psychological symptoms experienced when the drug is discontinued.
  - B. A state of psychological reliance on the drug for a sense of well-being.
  - C. The consumption of drug in quantities much greater than are recommended.
  - D. A reduced effect of the drug after repeated use, requiring higher doses to achieve the same effect.
  
3. \_\_\_\_\_ controls cardiac arrhythmia by blocking  $\text{Na}^+$  entry during depolarization phase.
  - A. Propranolol
  - B. Lidocaine
  - C. Verapamil
  - D. Furosemide

4. Determine the drug class commonly used as the first-line therapy for Type 2 Diabetes.
- A. Biguanides (Metformin)
  - B. Insulin
  - C. Sulfonylureas
  - D. Ketoconazole
5. Identify the statement that best describes heroin's action.
- A. It causes sleeplessness.
  - B. It suppresses the central nervous system.
  - C. It increases blood pressure.
  - D. It causes hallucination.
6. Antiepileptic or anticonvulsant drugs act by \_\_\_\_\_.
- A. causing the release of norepinephrine in pre-synaptic neuron
  - B. activating  $\alpha$  and  $\beta$  receptors
  - C. reducing electrical excitability and enhance GABA transmission
  - D. causing the release of acetylcholine in pre-synaptic neuron
7. Which of the following statements describes the mechanism of action for tricyclic antidepressants agents?
- A. Rapidly sustain the increase in serotonin, norepinephrine and dopamine level.
  - B. Block the uptake of norepinephrine and serotonin by the nerve terminals.
  - C. Selectively inhibit the uptake serotonin only.
  - D. Occupy the pre-synaptic neuron and cause the release of norepinephrine.

8. Zileuton's mechanism of action in treating asthma is by \_\_\_\_\_.
- A. inhibiting cyclooxygenase activity
  - B. antagonizing leukotriene receptors
  - C. inhibiting mast cell degranulation
  - D. blocking leukotriene production
9. Organic nitrates are drugs that are used to treat angina pectoris by \_\_\_\_\_.
- A. increasing myocardial oxygen consumption
  - B. increasing contraction of smooth muscle
  - C. relaxation of smooth muscle
  - D. enhancing cardiac workload
10. Chloroquine's mode of action as an antimalarial drug results in the \_\_\_\_\_.
- A. parasite cell autodigestion
  - B. interfering with the electron transport in the parasite
  - C. increase of body's natural immune response
  - D. killing of the mosquito that carries the parasite
11. A woman came to the hospital with an enlarged thyroid. She was suspected to have goiter. Which of the followings would be the best treatment for this condition?
- A. Intravenous infusion of TSH
  - B. Propylthiouracil
  - C. Levothyroxine
  - D. Iodine supplementation

12. The inclusion of \_\_\_\_\_ in oral contraceptives inhibits GnRH releasing factors.
- A. Premarin
  - B. Progesterone
  - C. Androgen
  - D. Estradiol
13. Drugs may lower the blood pressure by the following mechanism **EXCEPT**
- A. Block peripheral sympathetic nerve endings.
  - B. Promote Na<sup>+</sup> depletion.
  - C. Stimulate angiotensin converting enzyme (ACE).
  - D. Lower serum cholesterol levels.
14. Which of the following antifungal agents bind to sterols?
- A. Amphotericin B
  - B. Fluconazole
  - C. Flucytosine
  - D. Griseofulvin
15. A 75-year-old woman with hypertension is being treated with thiazide. Her blood pressure responds and reads at 120/76 mm Hg. After several months on the medication, she complains of being tired and weak. Analysis of the blood may indicate low values for \_\_\_\_\_.
- A. Calcium
  - B. Potassium
  - C. Uric acid
  - D. Sodium

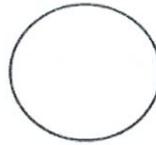
16. Antitussives are given with caution to patients with \_\_\_\_\_.
- A. chronic cough
  - B. rhinitis
  - C. asthma
  - D. hypertension
17. Expectorant is a mucolytic agent that dissolves thick mucus. Which of these drugs is classified as an expectorant?
- A. Codein
  - B. Dextromethorphan
  - C. Diphenhydramine
  - D. Guaifenesin
18. Which of the following antiviral agents is meant for HIV therapy?
- A. Interferon
  - B. Acyclovir
  - C. Protease inhibitor
  - D. Neuraminidase inhibitor
19. A long-distance truck driver complains of serious allergic rhinitis. Which of the following would be the best antihistamines to be prescribed?
- A. Loratadine
  - B. Dramamine
  - C. Cimetidine
  - D. Ranitidine

20. A woman is concerned about her chance of developing breast cancer; her mother died of the disease, and her sister has been diagnosed with the disease. A breast examination is negative. Which of the following might be used prophylactically in this woman?
- A. Estrogen
  - B. Cisplatin
  - C. Tamoxifen
  - D. Progesterone
21. Which of the following would be the best for long-term management of a patient with allergic rhinitis?
- A. Inhaled glucocorticoids
  - B. Oral pseudoephedrine
  - C. Oral glucocorticoids
  - D. Diphenhydramine
22. How does sulfonamide control a bacterial infection?
- A. Cause bacterial cell lysis.
  - B. Inhibit folic acid production.
  - C. Disrupt synthesis of peptidoglycan layers of bacterial cell walls.
  - D. Bind to sterols thus altering cell membrane permeability.

23. The following circles represent pupillary diameter in one eye prior to and following the topical application of Drug A. Which of the following is most likely to be Drug X?



Control



Drug X

- A. Propranolol
- B. Acetylcholine
- C. Atropine
- D. Carbachol
24. Which of the following is the correct mechanism of action for thiazolidinediones (TZDs)?
- A. Enhancing incretin hormone action.
- B. Stimulating pancreatic beta cells to secrete insulin.
- C. Inhibiting glucose absorption in the intestines.
- D. Increasing insulin sensitivity in peripheral tissues.
25. Which of the following best describes the mechanism by which propranolol lowers blood pressure in the treatment of hypertension?
- A. Acts as a calcium channel blocker to relax vascular smooth muscle.
- B. Stimulates  $\beta_1$ -adrenergic receptors in the heart, reducing cardiac output.
- C. Inhibits angiotensin-converting enzyme (ACE), reducing angiotensin II levels.
- D. Blocks  $\beta$ -adrenergic receptors, decreasing heart rate and renin release.

26. When reviewing Mr. Jamel's culture and sensitivity test results, the laboratory officer learns that the bacteria causing Mr. Jamel's infection are sensitive to penicillin. The officer interprets from this result that \_\_\_\_\_.
- A. penicillin will not be effective in treating the infection
  - B. Mr. Jamel developed resistance towards penicillin
  - C. penicillin will be effective in treating the infection
  - D. Mr. Jamel is allergic to penicillin
27. Which of the following pair of anticancer drug and its mechanism is **INCORRECT**?
- A. Mercaptopurine – inhibit DNA synthesis
  - B. Tamoxifen – inhibit estrogen's binding site
  - C. Taxol – inhibit spindle dynamics
  - D. Cisplatin – enhance immune system
28. Determine the condition for which methimazole is primarily used for.
- A. Diabetes mellitus
  - B. Hypothyroidism
  - C. Cushing's syndrome
  - D. Hyperthyroidism
29. Which statement(s) describe(s) the actions of adrenergic or cholinergic agonists on the gastrointestinal tract?
- i. Cholinergic agonists increase GI motility and secretions.
  - ii. Adrenergic agonists decrease GI motility and secretions.
  - iii. Adrenergic agonists have little effect on motility and secretions.
- A. i only
  - B. iii only
  - C. ii only
  - D. i and ii only

30. Which of the following substances is **NOT** a stimulant of the central nervous system?
- A. Cocaine
  - B. Heroin
  - C. Ecstasy
  - D. Nicotine
31. Which of the following is a short-acting barbiturate hypnotics which is used as intravenous anesthetics?
- A. Phenobarbital
  - B. Diazepam
  - C. Thiopental
  - D. Flurazepam
32. Which of the following is **NOT** a postsynaptic effect of the CNS neurotransmitter?
- A. ACh – arousal
  - B. Serotonin – feeding behavior
  - C. Glutamate – memory
  - D. GABA – action potentials
33. Which of the following is **NOT** a characteristic of sympathetic stimulation?
- A. Decreased intestinal motility.
  - B. Relaxation of the bronchi.
  - C. Stimulation of salivation.
  - D. Contraction of urinary bladder sphincter.

34. What is the primary action of atropine on the autonomic nervous system?
- A. Inhibits norepinephrine reuptake.
  - B. Blocks cholinergic receptors.
  - C. Stimulates cholinergic receptors.
  - D. Activates beta-2 adrenergic receptors.
35. Which of the following drugs is classified as a non-selective beta-blocker?
- A. Atenolol
  - B. Salbutamol
  - C. Metoprolol
  - D. Propranolol
36. Which of the following substances will increase the absorption of inorganic iron?
- A. Para-amino benzoic acid (PABA)
  - B. Nicotinic acid
  - C. Ascorbic acid
  - D. Vitamin K
37. Which of the following describes the action of allopurinol in the treatment of gout?
- A. Inhibits uric acid reabsorption.
  - B. Interferes with cytokine production.
  - C. Inhibits prostaglandin biosynthesis.
  - D. Inhibits formation of uric acid from purines.

38. The following are antithrombotic drugs used to prevent or treat abnormal blood clotting **EXCEPT**
- A. Streptokinase
  - B. Aspirin
  - C. Warfarin
  - D. Vitamin K
39. What is the primary mechanism of action of colchicine in gout?
- A. Enhances uric acid excretion.
  - B. Inhibits xanthine oxidase.
  - C. Blocks COX-2 selectively.
  - D. Inhibits microtubule polymerization in neutrophils.
40. The following are **TRUE** regarding aspirin **EXCEPT**
- A. Selective COX-2 inhibitor
  - B. Possess analgesic properties
  - C. Inhibit cyclooxygenase
  - D. Cause GI disturbances

**SECTION B (Total: 60 marks)**

Answer **THREE (3)** questions only.

Please use the answer booklet provided.

**Question 1**

Drug addiction is a chronic, relapsing brain disorder involving the central nervous system (CNS), marked by compulsive drug seeking and use, despite harmful consequences.

- (a) Define drug addiction and distinguish it from drug tolerance, physical dependence, and withdrawal symptoms.

(8 marks)

- (b) With examples, describe the pharmacological basis of addiction for one CNS stimulant and one CNS depressant.

(6 marks)

- (c) Compare the pharmacological interventions between methadone and naltrexone in the treatment of substance use disorders.

(6 marks)

**Question 2**

Contraception plays a vital role in reproductive health and family planning. Various pharmacological and non-pharmacological methods are available, each with unique mechanisms and implications.

- (a) Describe the two main types of oral contraceptive pills and explain their mechanisms of action.

(6 marks)

- (b) Compare the advantages and disadvantages of oral contraceptives with non-pharmacological interventions, including intrauterine devices (IUDs) and barrier methods.

(10 marks)

- (c) What are the ethical and social considerations that healthcare professionals should take into account when providing contraceptive advice or services.

(4 marks)

**Question 3**

Antibiotics are essential in treating bacterial infections, but their effectiveness is increasingly threatened by resistance.

- (a) Describe the classification of antibiotics based on:
- i. Spectrum of activity. (4 marks)
  - ii. Mechanism of action. (6 marks)
- (b) Explain two major mechanisms by which bacteria develop resistance to antibiotics. (4 marks)
- (c) Briefly describe practical strategies that can be implemented to reduce antibiotic resistance in the healthcare or community settings. (6 marks)

**Question 4**

Mr. Rahman, a 62-year-old male, presents with chest pain on exertion and elevated blood pressure (160/95 mmHg). He is diagnosed with stable angina pectoris and stage 2 hypertension. He is prescribed nitroglycerin for acute angina relief and verapamil for long-term control of blood pressure and prevention of anginal attacks.

- (a) Briefly explain the pathophysiology of angina pectoris and outline the primary goals of its pharmacological management.

(4 marks)

- (b) Describe the mechanism of action of nitroglycerin and explain how it relieves angina symptoms in Mr. Rahman.

(4 marks)

- (c) Explain how verapamil helps in the management of both angina pectoris and hypertension.

(4 marks)

- (d) Describe four other classes of antihypertensive drugs.

(8 marks)

**END OF EXAMINATION PAPER**

