



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCE
DEPARTMENT OF REHABILITATION MEDICINE
BACHELOR OF SCIENCE IN PHYSIOTHERAPY
END OF SEPT-DECEMBER 2025 TRIMESTER EXAMINATIONS**

UNIT CODE: PHT 323

UNIT NAME: Pharmacology in PT upgrading

DATE: 9th December 2025

TIME: TWO HOURS

START: 6pm

STOP : 8pm

INSTRUCTIONS (physical exams)

- 1. Do not write on this question paper**

(Marks and questions distribution as per program curriculum.)

INSTRUCTIONS (Online examinations)

1. This exam is marked out of 70 marks
2. This Examination comprises 3 Sections
3. This online exam shall take 2 Hours
4. Late submission of the answers will not be accepted
5. Ensure your web-camera is on at all times during the examination period
6. No movement is allowed during the examination
7. Idling of your machine for 5 min or more will lead to lock out from the exam
8. The Learning Management System (LMS) has inbuilt integrity checks to detect cheating
9. Any aspect of cheating detected during and or after the exam administration will lead to nullification of your exam
10. In case you have any questions call the invigilator for this exam on Tel. 0705833434 and or the Head of Department on Tel 0720491032
11. For adverse incidences please write an email to: amiu.examinations@amref.ac.ke

Answer all the MCQs

1. With regard to levodopa administration, "end-of-dose akinesia" describes the phenomenon where
 - A. a patient experiences hallucinations and other psychotropic effects of levodopa
 - B. drug effects follow an on-off pattern throughout the day
 - C. levodopa seems to become less effective when it is administered for prolonged periods (3 to 4 years)
 - D. the effectiveness of levodopa seems to wear off prior to the next dose
2. Catechol-O-methyltransferase (COMT) inhibitors such as entacapone (Comtan) and tolcapone (Tasmar) may enhance the effects of levodopa because these drugs
 - A. decrease the breakdown of dopamine in the brain
 - B. increase dopamine absorption from the GI tract
 - C. prevent conversion of levodopa to an inactive metabolite in the bloodstream
 - D. increase the breakdown of dopamine in the brain
3. Botulinum toxin is used to treat spasticity by injecting this drug
 - A. intravenously
 - B. intrathecally
 - C. subcutaneously
 - D. directly into the spastic muscle
4. Opioid analgesics are also known commonly as _____ because they tend to have sedative or sleep-inducing side effects and high doses can produce a state of unresponsiveness and stupor.
 - A. narcotics
 - B. narcoleptics
 - C. neuroleptics
 - D. naturopathics
5. The onset of withdrawal symptoms (body aches, shivering, sweating, and so forth) after sudden discontinuation of opioid analgesics is an example of
 - A. drug tolerance
 - B. physical dependence
 - C. psychological dependence
 - D. anaphylaxis
6. The _____ effect occurs when drugs are transported initially to the liver where a significant amount of the drug may be metabolized and destroyed before the drug reaches its primary site of action.
 - A. malabsorptive
 - B. first pass
 - C. Bohr
 - D. bioequivalence
7. TCertain drugs are not able to pass from the bloodstream into the CNS because of the unique structure and function of the CNS capillaries, known commonly as the
 - A. blood-brain barrier
 - B. circle of Willis
 - C. glomerulus
 - D. septum pellucidum
 - E. corpus callosum

8. All preganglionic neurons and parasympathetic postganglionic neurons are said to be _____ in nature because of the presence of _____ at their respective synapses.
- A. adrenergic; norepinephrine
 - B. cholinergic; norepinephrine
 - C. adrenergic; acetylcholine
 - D. cholinergic; acetylcholine
9. Nitrates such as nitroglycerin exert their primary beneficial effects in people with angina pectoris because these drugs _____ myocardial oxygen demand by vasodilating the _____.
- A. decrease; coronary arteries
 - B. increase; coronary arteries
 - C. decrease; peripheral vasculature
 - D. increase; peripheral vasculature
10. Beta blockers help prevent angina pectoris in certain patients because these drugs
- A. decrease myocardial oxygen demand
 - B. increase myocardial oxygen supply
 - C. decrease oxygen demand in peripheral tissues (skeletal muscle)
 - D. increase cardiac output
11. Aspirin and other antiplatelet drugs are often administered to people with angina pectoris to
- A. prevent headache
 - B. decrease myocardial oxygen demand
 - C. prevent coronary artery infarction
 - D. all the above are true
12. Which of the following drug categories is NOT used to treat cardiac arrhythmias?
- A. sodium channel blockers
 - B. chloride channel blockers
 - C. beta blockers
 - D. calcium channel blockers
13. The primary cardiac problem in digitalis toxicity is
- A. decreased coronary blood flow
 - B. increased coronary oxygen demand
 - C. decreased cardiac intracellular sodium concentration.
 - D. arrhythmia
14. All of the following types of drugs will decrease cardiac workload in people with heart failure EXCEPT
- A. angiotensin converting enzyme (ACE) inhibitors
 - B. beta blockers
 - C. alpha-1 stimulants
 - D. vasodilators
15. In people with heart failure, the best drugs for reducing excessive sympathetic stimulation of the failing heart are

- A. alpha blockers
 - B. beta blockers
 - C. angiotensin II receptor blockers
 - D. calcium channel blockers
16. In people with heart failure, the best drugs for reducing fluid accumulation and congestion in the lungs and peripheral tissues are
- A. alpha blockers
 - B. beta blockers
 - C. angiotensin II receptor blockers
 - D. diuretics
17. Oral anticoagulants such as warfarin (Coumadin) decrease the production of several clotting factors in the liver by interfering with the regeneration of
- A. tissue thromboplastin
 - B. tissue plasminogen activator
 - C. vitamin K
 - D. vitamin D
18. In a patient with acute deep vein thrombosis (DVT), anticoagulant therapy is typically initiated with _____ to achieve rapid control of clotting, and then switched over to _____ for long-term management or prevention of DVT.
- A. heparin; oral anticoagulants
 - B. oral anticoagulants; thrombin
 - C. thrombin; tissue plasminogen activator
 - D. tissue plasminogen activator; fibrinolysis inhibitors
19. Because Alzheimer disease is associated with loss of cortical neurons that release acetylcholine, _____ may be helpful in improving cognition and memory during the early stages of this disease.
- A. direct cholinergic stimulants
 - B. indirect cholinergic stimulants
 - C. direct adrenergic stimulants
 - D. indirect adrenergic stimulants
20. Patients who develop muscle pain and weakness when taking lipid lowering drugs such as atorvastatin (Lipitor) and simvastatin (Zocor)
- A. should continue on the lipid lowering drugs because these muscle symptoms are usually not severe
 - B. should continue on the lipid lowering drugs but resolve the muscle pain through strenuous resistance exercises
 - C. should continue on the lipid lowering drugs but take an analgesic such as aspirin to control the pain
 - D. should be removed immediately from the drug because these symptoms may represent potentially serious myopathies

21. Drugs that decrease the viscosity of respiratory secretions are known commonly as _____, whereas drugs that facilitate the production and ejection of mucus are known commonly as _____.
- A. expectorants; mucolytics
 - B. mucolytics; expectorants
 - C. antihistamines; bronchodilators
 - D. bronchodilators; antihistamines
22. Drugs such as cimetidine and ranitidine that selectively block histamine type 2 (H₂) receptors on stomach parietal cells
- A. prevent the histamine-activated release of gastric acid
 - B. are available only by prescription
 - C. are known as antihistamines
 - D. all of the above are true
23. In many people with gastric ulcers, antibacterial drugs are often combined with proton pump inhibitors to help eliminate _____ infection as a potentiating factor in ulcer formation.
- A. h. pylori
 - B. streptococcal
 - C. e. coli
 - D. girardia
24. A drug that selectively stimulates alpha-1 adrenergic receptors will cause
- A. vasoconstriction of peripheral arterioles
 - B. increased heart rate
 - C. decreased blood pressure
 - D. bronchodilation
25. To increase cardiac output, a drug should selectively _____ receptors on the heart.
- A. stimulate; alpha-1
 - B. inhibit; alpha-1
 - C. stimulate; alpha-2
 - D. stimulate; beta-1
26. A drug that selectively stimulates alpha-1 adrenergic receptors will cause
- A. vasoconstriction of peripheral arterioles
 - B. increased heart rate
 - C. decreased blood pressure
 - D. bronchodilation
27. Diuretics _____ the excretion of water by _____ sodium reabsorption at the kidneys.
- A. increase; inhibiting
 - B. decrease; inhibiting
 - C. increase; stimulating
 - D. decrease; stimulating
28. Nonselective beta blockers may produce bronchoconstriction in patients with asthma and similar respiratory disorders because nonselective beta blockers

- A. stimulate beta-1 receptors on the lungs
 - B. block beta-1 receptors on the lungs
 - C. stimulate beta-2 receptors on the lungs
 - D. block beta-2 receptors on the lungs
29. Nitric oxide can be used to reduce vascular resistance and decrease arterial pressure in specific hypertensive syndromes because nitric oxide
- A. inhibits (blocks) beta-1 receptors on the heart
 - B. inhibits (blocks) beta-2 receptors on the heart
 - C. inhibits (blocks) alpha-1 receptors on arteriole smooth muscle
 - D. directly inhibits the contraction of vascular smooth muscle
30. Abnormally high activity in the renin-angiotensin system should be controlled pharmacologically because increased production of Angiotensin II causes which of the following pathologies?
- A. cardiac arrhythmias
 - B. vascular smooth muscle hypertrophy
 - C. angina pectoris
 - D. vascular smooth muscle atrophy
31. Aspirin and other NSAIDs exert their primary therapeutic effects by interfering with the biosynthesis of
- A. leukotrienes
 - B. catecholamines
 - C. prostaglandins
 - D. cyclic AMP
32. Drugs that stimulate insulin secretion (e.g., sulfonylureas) or increase tissue sensitivity to insulin (e.g. metformin)
- A. are used to treat patients with poor glucagon production
 - B. are effective in some patients with Type I diabetes.
 - C. are effective in some patients with Type II diabetes.
 - D. all the above are true
33. Beta-lactamase inhibitors such as clavulanate, sulbactam, and tazobactam are typically combined with a specific type of penicillin
- A. to increase the absorption of penicillin from the GI tract
 - B. to enhance the penetration of penicillin into the bacterial cell
 - C. to prevent the beta-lactamase enzyme from destroying the penicillin
 - D. to prevent excessive excretion of the penicillin from the kidneys (i.e., more penicillin is retained in the body)
34. Certain anti-HIV drugs (e.g., zidovudine, didanosine, and zalcitabine) are known as reverse transcriptase inhibitors because they
- A. prevent adsorption/penetration of HIV into T4 lymphocytes
 - B. inhibit transcription of viral RNA to viral DNA
 - C. inhibit insertion of viral DNA into host-cell chromosomes
 - D. all the above are true

35. Reverse transcriptase inhibitors such as zidovudine, didanosine, and lamivudine are especially important for physical therapists because they may cause side effects such as
- A. peripheral neuropathy
 - B. myopathy
 - C. joint pain
 - D. all the above are true
36. Cutaneous and mucocutaneous infections such as tinea (ringworm) infections and candidiasis are typically treated with
- A. local or topical antibacterial drugs
 - B. local or topical antifungal drugs
 - C. systemic doses of antibacterial drugs
 - D. systemic doses of antifungal drugs
37. High doses of acetaminophen (e.g., 15 g) can be especially toxic to the:
- A. heart
 - B. liver
 - C. kidneys
 - D. stomach
38. Although several different drugs are available to treat malaria, many of these drugs are ineffective in certain parts of the world because
- A. malaria is difficult to diagnose accurately
 - B. the organism that causes malaria has become resistant to these drugs
 - C. antimalarial drugs must all be given by continuous intravenous infusion
 - D. all the above are true
39. Many antifungal drugs selectively affect fungal cells rather than human cells by impairing the synthesis or function of specific sterols and polysaccharides that are located in the fungal cell
- A. membrane
 - B. mitochondria
 - C. smooth endoplasmic reticulum
 - D. rough endoplasmic reticulum
40. Monoclonal antibodies may be especially effective in treating certain cancers because these drugs
- A. create a strong alkyl reaction with the DNA molecule
 - B. directly inhibit the topoisomerase enzyme responsible for DNA synthesis
 - C. are attracted directly to the cancer cell, without an appreciable affect on healthy tissues
 - D. directly inhibit the mitotic apparatus that is responsible for controlling cell division (mitosis)
41. Most anticancer drugs exert severe and potentially toxic side effects because
- A. these drugs have a high therapeutic index (TI)
 - B. most of these drugs are not approved by the FDA
 - C. most of these drugs do not discriminate between healthy tissues and cancerous cells
 - D. these drugs all have extremely long half-lives, and tend to accumulate in the body for an extended period of time

42. You are treating a 67y/o female for low back pain. She also has a history of a stage 2 bladder prolapse and hysterectomy. She notes urge and stress incontinence. Her medications include Bethanechol 10 mg (direct-acting parasympathetic stimulant) as prescribed by her gynecologist. What cardiovascular effect do you expect that may influence therapy?
- A. Increased blood pressure
 - B. Decreased blood pressure
 - C. Increased respiratory rate
 - D. There is no cardiovascular side effect with parasympathetic stimulants
43. You are treating an individual with a history of stable angina. They take sublingual nitroglycerine to control their symptoms about 1 time a week and follow up regularly with their cardiologist. During their treatment session they suffer symptoms of angina. You immediately stop the activity and the patient takes their nitroglycerine. When would you expect to see a reduction in their symptoms as an effect of the medication?
- A. 1 minute
 - B. 10 minutes
 - C. 20 minutes
 - D. 60 minutes
44. An individual is taking a non-selective beta blocker for the treatment of recurrent angina. They are exercising on the treadmill and you are continuing to monitor their vital signs. Which of the following do you expect?
- A. Decreased tolerance to exercise due to decrease cardiac output with exercise
 - B. Normal tolerance to exercise as long as angina symptoms do not occur
 - C. Increased tolerance to exercise compared to the same aged individual without a cardiac history
 - D. None of the above
45. You note that a patient you are performing an evaluation on has a rash along the L4 dermatome, which is the exact location of their complaint of symptoms. You contact the physician to note the possibility of shingles. What medication do you expect to be prescribed?
- A. Nucleoside antiviral agent
 - B. Penicillin
 - C. Tetracycline
 - D. Carbapenem
46. An individual is on chemotherapy. He has a schedule with the oncology department to attend appointments for administration of the drug every Friday for 3 months. He notes his treatment scheduled in 2 days has been cancelled based on a blood test he had performed yesterday. What is the most probable cause of the suspension of treatment?
- A. Insurance did not cover the last treatment
 - B. GI disturbance
 - C. Nadir
 - D. The patient is cured of his cancer
47. NSAIDs block all forms of COX including COX 1 resulting in which of the following side effects?
- A. GI upset and excessive blood clotting
 - B. Constipation and gastric ulcers
 - C. Headache and sweating
 - D. Nausea and increase risk of bleeding

48. By producing analgesic and anti-inflammatory effects, which drugs are usually considered the first line of defense in treating rheumatoid arthritis?
- A. acetaminophen
 - B. NSAIDs
 - C. opioids
 - D. leukotriene inhibitors
49. Which of the following is drug of choice for RA that would limit progression of the disease?
- A. Corticosteroids
 - B. NSAID
 - C. Selective COX 2 inhibitors
 - D. D-MARDS
50. Potentiation is a drug interaction that results in
- A. Cancellation of the first drugs effect
 - B. Limitation of the first drugs effect
 - C. Exaggeration of the first drugs effect
 - D. No change either drugs effect
51. The phrase first pass elimination refers to what?
- A. Passage of a drug directly through the digestive system into fecal matter
 - B. Metabolism of the drug by the liver
 - C. Filtration of a drug by the kidney
 - D. None of the above
52. Sedative hypnotics can effect rehabilitation of an individual by
- A. Causing insomnia
 - B. Increasing response time
 - C. Inducing tremors
 - D. Increasing anxiety
53. An individual is being seen in therapy for evaluation after tibial plateau fracture. He appears very agitated, demonstrates dilated pupils and is perspiring profusely. One explanation for the above symptoms could be
- A. Use of an opiate analgesic
 - B. Use of an anxiolytic medication
 - C. Opiate withdrawal
 - D. Anxiolytic medication withdrawal
54. An 85 y/o male patient comes into therapy with the PT diagnosis of knee pain and decreased rom secondary to severe osteoarthritis. He ambulates into PT with a severe limp with minimal stance phase through the affected knee. His primary care physician suggested that he take Tylenol (NSAID) 2 tablets (325 mg tablets) 4 times a day to assist with discomfort. Subjectively he reports no pain in sitting but pain at an 8 on a 1-10 scale with ambulation greater than 5 minutes. He is having difficulty with community ambulation due to pain. As you continue to question him about his pain levels, he notes he only takes Tylenol after community activity. He feels it is not helping. What is the most appropriate statement regarding his pain control
- A. Utilization of a NSAID is not effective for pain management with osteoarthritis

- B. His pain is not well controlled with the prescribed over the counter medication schedule
 - C. His physical therapist should advocate on the patients behalf for Opiate medications
 - D. Determination of success with the prescribed medication plan can only be determined after consistent used of the medication
55. You are evaluating an 87 y/o female patient that has recently been hospitalized following a car accident for evaluation of chest pain. She was released from the hospital and told that she had sternal discomfort due to inflammation of her ribs from where the seat belt pulled against her chest. Her PT prescription is for whiplash associated neck pain and costochondritis. She has been on Lortab 7.5/500 (Opiate and NSAID) for 8 years following a cervical fusion. Her physician refused to prescribe additional pain medications. She was given Soma (central acting muscle relaxant) by the hospitalist. She appears slightly confused and is not following directions given during the evaluation. Is her behavior consistent with the adverse drug reactions associated with her medications?
- A. Yes
 - B. No
56. A patient status post total knee arthroplasty was given a prescription for Lortab 5/500 (opiate with NSAID) every 6 hours as needed for pain. Outpatient therapy was arranged in your clinic on Thursday at 9 am (4 days post op). At his outpatient visit he reports 8 out of 10 pain. He states it was much harder to move at home than he thought it would be. His flexion ROM was 60 degrees with a painful empty endfeel. He demonstrates limited weight bearing through the effected leg with an antalgic gait pattern. What information about his medications to assist you in determining pain control?
- A. If he is taking the medication as prescribed
 - B. Timing of medication with treatment time
 - C. Pain rating at its best and worst time
 - D. all of the above
57. You are treating an individual for low back pain. She has a past medical history of Rheumatoid Arthritis and has been on a low dose of prednisone for several years (2.5mg/Day). She is also on Methotrexate (DMARD) 7.5 mg weekly. What is your concern for contraindications for this patient?
- A. Osteoporosis
 - B. Hypotension
 - C. Vertigo
 - D. All of the above
58. You are treating several patients following total knee arthroplasty in an inpatient hospital setting. You are attempting to appropriately schedule patients for therapy based on their pain control status. Choose the most ideal time for your treatment for optimal pain control. The patient is using a morphine (opiate) pump with self-administered bolus injections (patient hits the button attached to the Intravenous (IV) pump).
- A. Immediately after bolus
 - B. 10 minutes after bolus
 - C. 30 minutes after bolus
 - D. 1 hour after bolus
59. When treating an acute exacerbation of rheumatoid arthritis in a specific joint, anti-inflammatory steroids (glucocorticoids) can be injected directly into the joint, but the number of injections should be limited to how many per year.

- A. 2-3
- B. 5-6
- C. 8-10
- D. 12-15

60. You are treating several patients following total knee arthroplasty in an inpatient hospital setting. You are attempting to appropriately schedule patients for therapy based on their pain control status. Choose the most ideal time for your treatment for optimal pain control. The patient is taking Demerol (opiate) pills orally every 4 hours for pain control.
- A. Immediately after pill is taken
 - B. 10 minutes after pill is taken
 - C. 30 minutes after pill is taken
 - D. 5 hours after pill is taken
61. Sympatholytic drugs such prazosin and doxazosin can directly decrease vascular resistance by
- A. stimulating alpha-1 receptors on the arteriole
 - B. blocking alpha-1 receptors on the arteriole
 - C. stimulating alpha-2 receptors on the arteriole
 - D. blocking alpha-2 receptors on the arteriole
62. Calcium channel blockers can help reduce high blood pressure by
- A. stimulating the sinoatrial node in the heart
 - B. stimulating the atrioventricular node in the heart
 - C. inhibiting the vasomotor control center in the brainstem
 - D. inhibiting vascular smooth muscle contraction
63. If they stand up suddenly, patients taking antihypertensive medications may be more susceptible to a sudden ____ in blood pressure known commonly as ____.
- A. decrease; orthostatic hypotension
 - B. increase; orthostatic hypotension
 - C. decrease; orthostatic hypertension
 - D. increase; orthostatic hypertension
64. Nitroglycerin patches are typically used intermittently (e.g., 12 hours on, 12 hours off) to prevent
- A. skin irritation from the patch
 - B. liver toxicity
 - C. kidney damage
 - D. tolerance to the drug