

University of Mosul

College of Veterinary Medicine

Department of Physiology,

Biochemistry and Pharmacology



Competitive examination/Ph.D.

in Veterinary Pharmacology

Time: 3 Hours

Date: / / 2025

Choose the correct answer from the following: (Answer all the questions) (100 marks)

1- Which of the following represents a mechanism of antiviral action of remdesivir against corona viruses.

- (A) Interference with viral cell binding (B) Interruption of virus uncoating
(C) Inhibits the activity of the viral RNA-dependent RNA-polymerase
(D) Inhibit bacterial cell wall synthesis

2- Drug efficacy' refers to:

- (A) The range of diseases in which the drug is beneficial
(B) The maximal intensity of response that can be produced by the drug
(C) The therapeutic dose range of the drug
(D) The therapeutic index of the drug

3- Which of the following statements concerning drug receptors is true?

- (A) Drug receptors play an important role in the bioavailability of a drug.
(B) Drugs cannot act unless they are first released from a drug receptor.
(C) A drug can act as an antagonist even if it is bound to a drug receptor.
(D) Drugs cannot act unless they are first bound to a receptor.

4- Activation of which of the following G protein-coupled receptors will most likely cause an increase in Ca²⁺ release from the endoplasmic reticulum?

- (A) G_s (B) G_{i/o} (C) G_q (D) cAMP

5- Which of the following is a correct statement regarding species variation in pharmacokinetics/pharmacodynamics?

- (A) In the dog, glucuronidation of drugs is only present at a low rate.
(B) Xylazine is a much more potent sedative in horses than cattle.
(C) Horses have higher levels of plasma esterases than cattle to break down succinylcholine.
(D) There is no species variation in pharmacological response

6- The mechanism of action of digoxin's positive inotropic effect is:

- (A) direct stimulation of the Na⁺-Ca²⁺ exchanger.
(B) competitive inhibition of Na⁺, K⁺-ATPase.
(C) activation of G_s protein. (D) peripheral and central sympathetic stimulation.

7- Which of the following laxatives act to reduce blood ammonia concentrations and thus is a component of hepatic encephalopathy therapy?

- (A) Magnesium sulfate (B) Lactulose (C) Castor oil (D) Bethanechol

8- The primary reason for addition of glucose or fructose to oral rehydration solutions in treating diarrheal is

- (A) To correct the severe hypoglycemia and weakness.
(B) To stimulate disaccharidase activity in the mucosal brush border
(C) To stimulate sugar-sodium coupled uptake by enterocytes.
(D) To provide a hypertonic gradient for water absorption

9- Chronic administration of a glucocorticoid may:

- (A) Increase the amount of adipose tissue in the body by decreasing lipolysis.
(B) Induce osteoporosis. (C) Induce lymphocytosis. (D) Inhibit osteoporosis

10- Keratolytic agents work primarily by:

- (A) Lysing keratinocytes by destroying sulfur bonds.
(B) Acting as softening agents by hydrating keratinocytes.
(C) Dissolving the keratinocytes.
(D) stopping the production of keratin within keratinocytes.

11- Which one of the following antitrepatodal drugs is most effective against immature Fasciola hepatica in cattle?

- (A) Albendazole (B) Clorsulon (C) Praziquantel (D) Oxamniquine

12- A prodrug is:

- (A) The prototype member of a class of drugs (B) The oldest member of a class of drugs
(C) An inactive drug that is transformed in the body to an active metabolite
(D) A drug that is stored in body tissues and is then gradually released in the circulation

13- Which of the following represents the mechanism of antifungal action of echinocandins?

- (A) Inhibition of cell wall synthesis (B) Inhibition of cell membrane synthesis
(C) Inhibition of ergosterol synthesis (D) Inhibition of viral replication

14- The pharmacologic effects of Progesterone include :

- (A) Stimulate and maintain the reproductive tract and cause hyperemia, hypertrophy, and edema during estrus.
(B) Desensitize the myometrium to oxytocin (i.e., it prevents uterine contractions during pregnancy).
(C) Desensitize the myometrium to oxytocin (i.e., it induce uterine contractions during pregnancy).
(D) Abortion in animals.

15- Bromocriptine is clinically used to:

- (A) Treat pseudopregnancy (B) Treat galactorrhea (C) Treat bacterial infection (D) Induce abortion

16- Magnesium ion is necessary in.....

- (A) Inhibiting enzyme systems (B) Muscular relaxation (C) Nerve conduction (D) Action potential

17- The maximum effect (E max) achieved by a drug is a measure of:

- (A) The drug's potency. (B) The drug's efficacy (intrinsic activity).
(C) The drug's antagonistic magnitude. (D) The drug's therapeutic index.

18- The renal clearance of a drug (weak organic base) is favored if the drug:

- (A) Has low solubility in water. (B) Has a high degree of binding to plasma protein.
(C) Is put in the ionized form by acidifying the urine.
(D) Is put in the nonionized form by alkalinizing the urine.

19- The β -Blocker reduce blood pressure primarily by:

- (A) Increasing cardiac output, Decrease sympathetic outflow from central nervous system, Inhibit release of rennin from kidney.
(B) Decreasing cardiac output, increase sympathetic outflow from central nervous system, Inhibit release of rennin from kidney.
(C) Decreasing cardiac output, decrease sympathetic outflow from central nervous system, Inhibit release of rennin from kidney.
(D) Decreasing cardiac output, decrease sympathetic outflow from central nervous system, induce release of rennin from kidney.

20- Dihydropyridines class (calcium-channel blockers) particularly attractive in treating hypertension because :

- (A) Dihydropyridines have a much greater affinity for vascular calcium channels than for calcium channels in the heart.
(B) Dihydropyridines have a much greater affinity for heart calcium channels than for calcium channels in the vascular.
(C) Dihydropyridines have a much greater affinity for both calcium channels in the heart and vascular.
(D) Its effect on beta receptors

21- Bromhexine HCl is a frequently prescribed mucolytic may increase the concentration of certain antibiotics in the alveoli by:

- (A) Altering the permeability of the alveolar/capillary membranes.
(B) Breaks the disulfide bonds within the mucus molecules and decreases the viscosity.
(C) Strengthens the disulfide bonds within the mucus molecules and increases the viscosity.
(D) Increasing the blood pressure.

22- Which one of the following sentences represents the equation for the Volume of distribution (Vd):

- (A) Amount of drug in body /Concentration of drug in body (L/k)
- (B) Concentration of drug in body /Amount of drug in body (L/k)
- (C) Concentration of drug in body /Concentration of drug in body (L/k)
- (D) The bioavailability / clearance

23- Nicotinic receptor sites are found in all of the following locations, except:

- (A) Parasympathetic ganglia.
- (B) Sympathetic ganglia.
- (C) Bronchial smooth muscle.
- (D) Skeletal muscle

24- An undesirable effect of a drug that occurs at therapeutic doses and can be predicted from its pharmacological actions is called.....

- (A) Idiosyncrasy
- (B) Toxic effect
- (C) Allergic reaction
- (D) Side effect

25- Which one of the following statements about the mechanism of antiparasitic action of ivermectin is accurate

- (A) By stimulating the release of GABA causes paralysis of the parasite and eventual death.
- (B) Stimulates the parasympathetic and sympathetic ganglia in susceptible parasite.
- (C) Interferes with parasite carbohydrate metabolism by blocking fumarate reduction and succinate oxidation.
- (D) Stimulate beta receptors.

26- Aspirin prolongs bleeding time by inhibiting the synthesis of

- (A) Clotting factors in liver
- (B) Prostacyclin in vascular endothelium
- (C) Cyclic AMP in platelets
- (D) Thromboxane A2 in platelets

27- Colloids used in fluid therapy is a large molecules that :

- (A) Enhance the osmotic pressure of blood, causing fluid to move from the vascular and intracellular spaces into the interstitial space.
- (B) Enhance the osmotic pressure of blood, causing fluid to move from the interstitial and intracellular spaces into the vascular space.
- (C) Decline the osmotic pressure of blood, causing fluid to move from the interstitial and intracellular spaces into the vascular space.
- (D) Increasing the GFR.

28- The primary mechanism by which prostaglandins promote ulcer healing is:

- (A) Inhibition of gastric secretion.
- (B) Augmentation of bicarbonate buffered mucus layer covering gastroduodenal mucosa.
- (C) Increased turnover of gastric mucosal cell.
- (D) stimulation the gastric secretion.

29- Which one of the following drugs will reverse the respiratory depression and sedation caused by morphine?

- (A) Fentanyl (B) Nalbuphine (C) Carfentanil (D) Atropine

30- The antibacterial activity of amoxicillin may include penicillinase-producing organisms if it is combined with:

- (A) Penicillin (B) Clavulanic acid (C) Enrofloxacin (D) Ciprofloxacin

31- The mechanism of action of tylosin through

- (A) Inhibiting the bacterial cell membrane functions (B) Inhibiting the bacterial protein synthesis
(C) Inhibiting the bacterial cell wall synthesis (D) Inhibiting the bacterial DNA gyrase

32- The mechanism of action of Noradrenaline through.....

- (A) Antagonist activity on adrenergic receptors (B) Agonist activity on the cholinergic receptors
(C) Antagonist activity on the cholinergic receptors (D) Agonist activity on adrenergic receptors

33- The mechanism of action of medetomidine through.....

- (A) Antagonist activity on the alpha 1 receptor (B) Agonist activity on the alpha 2 receptors
(C) Agonist activity on the Beta 1 receptor (D) Agonist activity on the Beta 2 receptors

34- The mechanism of action of desloratadine through.....

- (A) Antagonist activity on the H1 receptor (B) Agonist activity on the H2 receptors
(C) Agonist activity on the H1 receptor (D) Agonist activity on the H3 receptors

35- The mechanism of action of Bosentan through

- (A) Antagonist activity on the endothelin A and B receptors.
(B) Agonist activity on the endothelin A and B receptors.
(C) Agonist activity on the endothelin B receptor only.
(D) Antagonist activity on the endothelin B receptor only.

36- Which expectorant, when nebulized and inhaled, breaks the disulfide bonds within the tracheal mucus molecules?

- (A) Guaifenesin (B) N-acetylcysteine (C) Potassium iodide (D) Saline

37- The diuretic effect of methylxanthines is due to increased.....

- (A) The pH of ECF and urine (B) Hydrogen ions (C) Renal blood flow (D) Ca⁺⁺ absorption

38- The anti-inflammatory effect of NSAIDs is due to inhibition of

- (A) TXA₂ (B) PGE₂ (C) LOX (D) PGI₂

39- Why is oxytetracycline generally not administered by injection in horses?

- (A) It causes irreversible kidney damage
(B) It leads to severe colitis and potentially fatal diarrhea
(C) It is not absorbed when given parenterally
(D) It has no antibacterial activity in horses

40- The mechanism by which most drugs are absorbed following an intramuscular injection is:

(A) Pinocytosis. (B) Active transport. (C) Simple diffusion (D) Facilitated diffusion.

41- Bioavailability of drug refers to:

(A) Percentage of administered dose that reaches systemic circulation in the unchanged form.

(B) Ratio of oral to parental dose.

(C) Ratio of orally administered drug to that excreted in the feces.

(D) Percentage of administered dose that reaches systemic circulation in the changed form.

42-Why are sulfonamides generally not used in dogs?

(A) Because sulfonamides are rapidly metabolized in dogs

(B) Because dogs have a deficiency in phase I oxidation enzymes

(C) Because dogs have a problem with phase II acetylation metabolism

(D) Because sulfonamides are not absorbed in the canine gastrointestinal tract

43- Most diarrhea remedies contain?

(A) Citrates (B) Kaolin

(C) Benzocaine (D) Aluminum oxide

44- Which of the following is a common effect of muscarinic stimulant drugs?

(A) Decreased peristalsis (B) Miosis

(C) Hypertension (D) Inhibition of sweat glands

45- Which of the following drugs is used for treatment of inflammatory and immune-mediated disease.

(A) Diclofenac (B) Fentanyl (C) Ephedrine (D) Dexamethasone

46- Which of the following is a phase II drug metabolizing reaction?

(A) Conjugation (B) Hydrolysis (C) Oxidation (D) Reduction

47- Which one of the following statements best describes the disinfectants?

(A) chemical agent that reduces the microbial population on skin and other living tissues.

(B) process that eliminates most of pathogenic organisms from an inanimate object.

(C) Drugs used to treat parasitic infection.

(D) Chemical agents used to destroy or reduce the number of pathogenic microorganisms on living surfaces.

48- Barbiturates potentiate the activity of.....

(A) Muscarinic receptor (B) Nicotinic receptor (C) GABA receptor (D) Glycine receptor

49- Stage-III of the general anesthesia is called:

(A) Stage of Analgesia (B) Stage of delirium (C) Stage of surgery (D) Stage of voluntary excitation

50- The brief duration of action of an ultrashort acting barbiturate (Thiopental) is due to:

(A) Slow rate of metabolism in the liver.

(B) Low lipid solubility, resulting in a minimal concentration in the brain.

(C) Rapid rate of redistribution from the brain due to its high lipid solubility.

(D) Low lipid solubility, resulting in a maximal concentration in the brain.

51- What is the primary topical action of astringents?

- (A) Soften skin and reduce inflammation
- (B) Precipitate proteins, toughen skin, promote healing, and dry the skin
- (C) Increase moisture and skin absorption
- (D) Inhibit bacterial growth only

52- What is the mechanism of action of Dinoprost (PGF₂ α) in reproductive management?

- (A) Causes ovulation directly
- (B) Induces follicle rupture
- (C) Causes luteolysis for estrus synchronization
- (D) Maintains corpus luteum

53- What is the correct description of laxatives and cathartics?

- (A) Drugs that decrease intestinal motility and harden stools
- (B) Drugs that soften the stool and promote bowel movement
- (C) Drugs that prevent nutrient absorption
- (D) Drugs that stimulate vomiting and reduce appetite

54- Which corticosteroid is preferred in liver disease cases?

- (A) Prednisolone
- (B) Prednisone
- (C) Dexamethasone
- (D) Hydrocortisone

55- What is the mechanism of action of methotrexate (MTX)?

- (A) Enhances folic acid absorption
- (B) Inhibits thymidylate synthetase and dihydrofolate reductase
- (C) Blocks DNA polymerase
- (D) Stimulates T-cell activation

56- What is the major adverse effect of doxorubicin and daunorubicin?

- (A) Nephrotoxicity
- (B) Hepatotoxicity
- (C) Cardiotoxicity
- (D) Neurotoxicity

57- Propranolol is classified as:

- (A) Beta-1 selective antagonist
- (B) Beta-2 selective agonist
- (C) Non-selective beta antagonist
- (D) Alpha-1 selective blocker

58- What is the key characteristic of alkylating agents in cancer therapy?

- (A) Form reversible DNA bonds
- (B) Target RNA replication
- (C) Inhibit microtubule assembly
- (D) Have an electrophilic center that binds covalently to DNA

59- What is the mechanism of action of xylazine?

- (A) Alpha-1 agonist
- (B) Beta-2 agonist
- (C) Alpha-2 antagonist
- (D) Alpha-2 agonist

60- What is the mechanism of action of pilocarpine?

- (A) Antagonist of muscarinic receptors
- (B) Agonist of nicotinic receptors
- (C) Agonist of muscarinic receptors
- (D) Antagonist of adrenergic receptors

61- What is the mechanism of action of tubocurarine?

- (A) Agonist at muscarinic receptors
(B) Antagonist at nicotinic receptors
(C) Agonist at nicotinic receptors
(D) Antagonist at muscarinic receptors

62- What is the mechanism of action of dantrolene?

- (A) Antagonizes ryanodine receptors
(B) Activates calcium channels
(C) Inhibits muscarinic receptors
(D) Stimulates GABA receptors

63- Thiazide diuretics act to:

- (A) Increase sodium and water excretion while decreasing calcium excretion.
(B) Increase calcium excretion and reduce potassium levels.
(C) Promote potassium retention and inhibit calcium absorption.
(D) Increase magnesium loss and calcium excretion.

64- Strychnine toxicity is due to antagonism of which receptor?

- (A) NMDA
(B) Aspartate receptor
(C) Glycine receptor
(D) GABA receptor

65- Prokinetic drugs primarily act to:

- (A) Enhance nitric oxide release in the submucosal plexus, leading to smooth muscle relaxation.
(B) Inhibit dopamine D2 receptors centrally to induce emesis and reduce GI peristalsis.
(C) Stimulate serotonin 5-HT4 receptors and enhance acetylcholine release at the myenteric plexus.
(D) Block muscarinic receptors to slow intestinal transit and reduce motility.

66- What is the most commonly used therapy for liver cirrhosis in dogs?

- (A) Antibiotics
(B) Steroid therapy
(C) NSAIDs
(D) Antifungals

67- Doxapram is used to:

- (A) Induce vomiting
(B) Reduce respiration
(C) Induce respiration
(D) Reduce heart rate

68- Mucolytics work by:

- (A) Inhibiting mucus production
(B) Breaking down mucus structure
(C) Thickening mucus
(D) Reducing surfactant activity

69- How does potassium iodide act as an expectorant?

- (A) By inhibiting cough reflex
(B) By directly stimulating the bronchial glands
(C) By reducing surface tension
(D) By neutralizing acids in the lung

70- What is a clinical use of hypertonic saline in veterinary medicine?

- (A) To decrease gastric acid secretion
(B) To stimulate surfactant production in neonates
(C) To rapidly expand intravascular volume in hypovolemic shock
(D) To treat metabolic alkalosis

71- H2-antihistamines are primarily used to:

- (A) Relieve asthma attacks
(B) Treat allergic rhinitis
(C) Inhibit gastric acid secretion
(D) Increase appetite

72- Sympathomimetic decongestants reduce nasal discharge by:

- (A) Stimulating histamine release
- (B) Blocking muscarinic receptors
- (C) Enhancing mucus production
- (D) Constricting precapillary arterioles

73- Aspirin is classified as:

- (A) A selective COX-2 inhibitor
- (B) A non-selective COX inhibitor
- (C) A leukotriene antagonist
- (D) An H1-antagonist

74- Combination chemotherapy is advantageous because it:

- (A) Reduces liver toxicity
- (B) Inhibits protein synthesis
- (C) Lowers the risk of resistance
- (D) Enhances DNA repair

75- Theophylline primarily acts as:

- (A) Phosphodiesterase inhibitor
- (B) Beta-2 agonist
- (C) Mast cell stabilizer
- (D) Leukotriene blocker

76- Losartan functions as:

- (A) Angiotensin-Converting Enzyme Inhibitor
- (B) Angiotensin II receptor antagonist
- (C) Calcium channel blocker
- (D) Aldosterone agonist

77- What is the pharmacological effect of endothelin?

- (A) Vasodilation
- (B) Bronchodilation
- (C) Severe vasoconstriction
- (D) Antipyretic action

78- What is the mechanism by which benzodiazepines may stimulate appetite in animals?

- (A) Suppression of dopamine release in the hypothalamus.
- (B) Blockade of serotonin receptors in the gut.
- (C) Inhibition of norepinephrine release from the adrenal gland.
- (D) Enhancement of GABA activity in the satiety center of the hypothalamus.

79- Leukotriene B4 is produced through:

- (A) Cyclooxygenase pathway
- (B) Lipoxygenase pathway
- (C) Tyrosine kinase pathway
- (D) Prostacyclin synthase pathway

80- What is the pharmacological action of cyproheptadine on appetite?

- (A) Serotonin agonist that enhances satiety
- (B) Dopamine agonist that suppresses hunger
- (C) Serotonin antagonist that stimulates appetite
- (D) Histamine agonist that induces anorexia

81- Ambrisentan is used in the treatment of pulmonary hypertension as:

- (A) ETA receptor agonist
- (B) Beta-2 agonist
- (C) Selective ETA receptor antagonist
- (D) Vasopressin analog

82- Which of the following best describes autacoids?

- (A) Hormones secreted into the bloodstream to act on distant organs.
- (B) Enzymes that catalyze cellular respiration.
- (C) Structural proteins involved in cell division.

- (D) Locally acting chemical mediators with rapid metabolism.
- 83- Metoclopramide acts through which of the following mechanisms?**
- (A) 5-HT₄ receptor antagonist and D₁ receptor agonist.
 (B) 5-HT₃ receptor antagonist and D₂ receptor agonist.
 (C) 5-HT₄ receptor agonist and D₂ receptor antagonist.
 (D) 5-HT₃ receptor agonist and D₁ receptor agonist.
- 84- What is the mechanism of action of Dirlotapide in managing obesity in dogs?**
- (A) It increases glucose metabolism in fat cells.
 (B) It inhibits appetite by stimulating serotonin receptors in the brain.
 (C) It stimulates lipolysis in adipose tissue.
 (D) It inhibits the microsomal triglyceride transfer protein (MTP), reducing fat absorption.
- 85- Why does loratadine cause minimal sedation compared to first-generation antihistamines?**
- (A) Because it is a selective H₂ receptor antagonist.
 (B) Because it is non-ionized at physiological pH, allowing it to cross the blood-brain barrier.
 (C) Because it does not significantly cross the blood-brain barrier due to its ionized form at physiological pH.
 (D) Because it is metabolized into an active form only in the central nervous system.
- 86- What is the mechanism of action of acid pump inhibitors like omeprazole?**
- (A) Inhibit histamine H₂ receptors on parietal cells (B) Neutralize gastric acid directly
 (C) Enhance bicarbonate secretion (D) Inhibit H⁺/K⁺-ATPase on the luminal membrane of parietal cells
- 87- How does misoprostol exert its effect in the stomach?**
- (A) Inhibits PGI synthesis.
 (B) Stimulates gastric acid secretion directly.
 (C) Facilitates prostaglandin-mediated mucosal defenses and inhibits acid secretion.
 (D) Acts as a histamine H₁ antagonist.
- 88- What is the primary therapeutic action of Sucralfate in the treatment of gastric ulcers?**
- (A) It neutralizes gastric acid by increasing stomach pH.
 (B) It forms a protective gel over ulcer sites in acidic conditions.
 (C) It blocks histamine H₂ receptors to reduce acid production.
 (D) It stimulates gastric acid secretion for faster digestion.
- 89- Naloxone acts as:**
- (A) A full agonist at μ -opioid receptors (B) A partial agonist at all opioid receptors
 (C) An antagonist at μ -, κ -, and δ -opioid receptors (D) An inverse agonist at NMDA receptors
- 90- Which of the following is NOT a pharmacological effect of yohimbine?**
- (A) Increased sympathetic tone (B) Central nervous system inhibition
 (C) Increased heart rate and blood pressure (D) Alpha-2 adrenergic antagonism

91- Active transport of a substance across a biological membrane depends mainly on:

- (A) Lipid solubility
- (B) Degree of ionization
- (C) Osmotic gradient
- (D) Specific membrane carrier proteins and energy

92- What is the mechanism of action of Metronidazole against susceptible microorganisms?

- (A) Inhibition of bacterial cell wall synthesis.
- (B) Acts as a prodrug that is reduced inside anaerobic cells, leading to disruption of DNA structure and inhibition of nucleic acid synthesis.
- (C) Inhibition of protein synthesis at the 30S ribosomal subunit.
- (D) Blocking folic acid metabolism in aerobic bacteria.

93- What does the Therapeutic Index (TI) of a drug represent?

- (A) The ratio between the effective dose and the toxic dose.
- (B) The ratio between the toxic dose and the effective dose.
- (C) The extent of absorption of a drug from the gastrointestinal tract.
- (D) The total duration of drug action in the body.

94- What is the appropriate treatment approach for hypokalemia?

- (A) Administer calcium gluconate to increase potassium levels.
- (B) Avoid all electrolyte supplementation and observe only.
- (C) Use furosemide to help retain potassium.
- (D) Do not administer calcium, as it does not treat potassium deficiency.

95- What is the appropriate approach in managing respiratory alkalosis?

- (A) Administer respiratory stimulants to enhance CO₂ elimination.
- (B) Administer sedatives to calm the respiratory center and reduce hyperventilation.
- (C) Increase oxygen supply to accelerate gas exchange.
- (D) Encourage hyperventilation to maintain blood pH.

96- Which of the following intravenous fluids is considered hypotonic and used in fluid therapy?

- (A) 0.9% NaCl (Normal saline)
- (B) 5% Dextrose in water (D5W), after metabolism
- (C) 3% NaCl solution
- (D) Lactated Ringer's solution

97- What is the mechanism of action of Deltamethrin as an insecticide?

- (A) Inhibition of acetylcholinesterase, causing accumulation of acetylcholine at synapses.
- (B) Activation of nicotinic receptors in the insect's nervous system.
- (C) Disruption of sodium channel function, prolonging their opening and causing paralysis.
- (D) Blocking GABA receptors, leading to excessive neuronal firing.

