Ministry of Higher Education & Scientific Research
Tikrit University
College of Veterinary Medicine
Postgraduate Section

Competitive exam for post-graduate studies
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Rank : MSc degree
Subject : Pharmacology
Time : 3 hrs
Date : 30 / 6 / 2026

Note: Answer all the following questions **(150 M)**

Candidate Name:
Candidate Signture :

Choose the correct answer:

1. Subchronic toxicity refers to exposure for:
A. Less than 24 hours B. 1–3 months C. More than 1 year
D. Only a single dose

2. The therapeutic index (TI) is calculated as:
A. ED50 / LD50 B. LD50 / ED50 C. LD1 / ED99
D. ED99 / LD1

3. Teratogenicity refers to:
A. Ability to cause cancer B. Ability to cause genetic mutations in adults
C. Ability to cause fetal malformations during development D. Ability to enhance drug absorption

4. The first step in the management of toxicosis is:
A. Administration of antidote B. Stabilization of vital signs
C. Clinical evaluation D. Removal of toxin

5. Activated charcoal works by:
A. Chemical neutralization B. Adsorption of toxicants
C. Increasing metabolism D. Enhancing absorption

6. Which emetic is commonly used in dogs?
A. Xylazine B. Apomorphine C. Yohimbine D. Atropine

7. Gastric lavage should be performed in:
A. Conscious animals only B. Unconscious or anesthetized animals
C. Animals with seizures D. Animals with corrosive ingestion

8. Naloxone is an antidote for:
A. Morphine overdose B. Organophosphate poisoning
C. Aspirin toxicity D. Iron toxicity

9. Ion trapping increases excretion by:
A. Increasing absorption B. Changing urine pH to trap ionized drugs
C. Increasing plasma protein binding D. Blocking metabolism

10. The antidote for organophosphate poisoning includes:
A. Vitamin K B. Atropine and 2-PAM C. Naloxone D. Flumazenil

11. Organophosphate insecticides mainly act by:
A. Blocking sodium channels B. Inhibiting acetylcholinesterase enzyme C. Stimulating GABA receptors D. Blocking calcium channels

12.Organochlorine insecticides mainly affect on:
A. Liver enzymes B. Na^+/K^+ ion channels in CNS
C. Kidney filtration D. Blood glucose level

13. The mechanism of organo-arsenical herbicides is:
A. Blocking sodium channels B. Inhibiting ATP production C. Uncoupling oxidative phosphorylation and enzyme inhibition D. Increasing acetylcholine

14. Which of the following methods is used to increase the excretion of a toxicant?
A. Administration of sodium bicarbonate B. Hemodilysis
C. Forced diuresis with mannitol D.Both b and c

15.Warfarin acts as a rodenticide by:
A. Causing CNS stimulation B. Inhibiting vitamin K–dependent clotting factors
C. Blocking calcium channels D. Destroying liver cells directly

16.The main mechanism of heavy metal toxicity is:
A. DNA replication B. Enzyme activation C. Formation of complexes with proteins (ligands) D. Hormone stimulation

17.Which chelating agent is used for arsenic poisoning?
A. EDTA B. Deferoxamine C. BAL (Dimercaprol) D. Atropine

18.The most important clinical sign of lead poisoning in cattle is:
A. Liver failure only B. Nervous signs like blindness and convulsions
C. Skin rash D. Weight gain

19.Which antidote is commonly used to treat Acetaminophen piosoning?
A.Sodium bicarbonate B.Naloxone C.Atropine D.N-acetylcystine

20.What is the recommended antidote for iron poisoning?
A. Deferoxamine B. Digoxin immune FAB C. Flumazenil D. Calcium lactate

21.A major adverse effect associated with aminoglycoside therapy is:
A. Hepatotoxicity B. Nephrotoxicity C. Photosensitivity
D. Aplastic anemia

22.Tetracyclines inhibit bacterial protein synthesis by:
A. Binding irreversibly to the 50S ribosome B. Preventing attachment of aminoacyl-tRNA to the 30S ribosome C. Inhibiting DNA replication
D. Blocking folic acid synthesis

23.Which macrolide is recognized as a motilin receptor agonist and may cause abdominal pain and diarrhea?
A. Azithromycin B. Clarithromycin C. Tulathromycin D. Erythromycin

24.Rifampin inhibits bacterial:
A. DNA gyrase B. RNA polymerase C. Cell wall transpeptidase D. Dihydrofolate reductase

25.Niclosamide exerts its antiparasitic action mainly by:

A. Increasing calcium influx B. Inhibiting glucose uptake and oxidative phosphorylation C. Stimulating parasite metabolism D. Blocking acetylcholine receptors

26.Praziquantel acts primarily by:

A. Inhibiting glucose uptake B. Blocking protein synthesis
C. Disrupting calcium homeostasis in the parasite D. Inhibiting DNA replication

27.What is the mechanism of action of griseofulvin?

A. Inhibits ergosterol synthesis B. Binds to microtubules and inhibits mitosis C. Forms pores in fungal membranes D. Inhibits DNA synthesis

28.Nystatin and natamycin exert their antifungal action by:

A. Inhibiting fungal DNA synthesis B. Blocking cytochrome P450 enzymes
C. Binding to ergosterol and increasing membrane permeability D. Inhibiting mitosis

29.What is the primary mechanism of action of azole antifungals?

A. Inhibit thymidylate synthase B. Inhibit ergosterol synthesis by blocking cytochrome P450 enzymes C. Bind to fungal DNA D. Inhibit spindle formation

30.Which antifungal drug is associated with significant renal toxicity?

A. Fluconazole B. Terbinafine C. Amphotericin B D. Griseofulvin

31.Rafoxanide is principally used against:

A. Adult *Fasciola hepatica* and *Fasciola gigantica* B. Immature liver flukes only C. Tapeworm infections D. Coccidiosis

32.Which adverse effect is most characteristic of carbon tetrachloride toxicity?

A. Renal failure B. Blindness only C. Liver damage and hepatic failure
D. Bone marrow suppression

33.What is the mechanism of action of oxyclozanide?

A. Inhibits DNA synthesis B. Uncouples oxidative phosphorylation
C. Inhibits microtubule formation D. Blocks calcium channels

34.What is the mechanism of action of sulfonamides against coccidia?

A. Inhibit DNA gyrase B. Block thiamine receptors C. Inhibit folic acid synthesis by competing with PABA D. Disrupt fungal cell membranes

35.Amprolium acts as:

A. A folic acid antagonist B. A DNA synthesis inhibitor
C. A thiamine antagonist D. A mitochondrial poison

36.What is the mechanism of action of metronidazole?

A. Binds to ergosterol B. Disrupts DNA synthesis through a ferredoxin-linked metabolite C. Inhibits folate synthesis D. Inhibits oxidative phosphorylation

37.Imidocarb is primarily used for the treatment of:

A. Coccidiosis B. Giardiasis C. Babesiosis D. Toxoplasmosis

38.Which adverse effect may occur with high doses of rafoxanide?

A. Blindness and optic nerve degeneration B. Deafness
C. Bone marrow suppression D. Nephrotoxicity

39.Besides its antiviral action, Amantadine also acts as a:

A. β-blocker B. NMDA receptor antagonist C. Calcium channel blocker D. Histamine antagonist

40.Acyclovir is primarily used in cats to treat:

A. FIV infection B. Feline herpesvirus-1 infections C. Feline leukemia virus infection D. Canine parvovirus infection

41.Zidovudine (AZT) acts mainly by inhibiting:

A. Viral neuraminidase B. Viral DNA polymerase
C. Reverse transcriptase D. Viral protease

42.Interferons inhibit viral replication primarily by:

A. Directly destroying viruses B. Blocking viral entry into cells
C. Altering host cell metabolism and inducing antiviral proteins D. Inhibiting bacterial protein synthesis

43.Which antiviral agent may cause leukopenia and anemia that are reversible after discontinuation?

A. Amantadine B. Interferon C. Acyclovir D. Zidovudine

44.Penicillin kills bacteria primarily by:

A. Inhibiting DNA replication B. Disrupting cell membrane phospholipids
C. Inhibiting transpeptidase involved in cell wall synthesis D. Inhibiting folic acid synthesis

45.Clavulanic acid is combined with amoxicillin because it:

A. Enhances protein synthesis inhibition B. Inhibits β-lactamases
C. Increases renal excretion D. Improves oral absorption

46.Which generation of cephalosporins can penetrate the blood-brain barrier and is resistant to many β-lactamases?

A. First generation B. Second generation C. Third generation
D. Fourth generation

47.Which carbapenem must be administered with cilastatin to reduce renal metabolism and toxicity?
A. Meropenem B. Aztreonem C. Imipenem D. Cefepime

48.Which adverse effect may occur after IV administration of potassium penicillin?
A. Ototoxicity B. Hyperkalemia and cardiac arrhythmias C. Bone marrow depression D. Hepatotoxicity

49.Which antimicrobial is too nephrotoxic for systemic use and is mainly used topically?
A. Bacitracin B. Amoxicillin C. Cefixime D. Aztreonem

50.Which cephalosporin is commonly used to treat respiratory disease in cattle and horses?
A. Cephalexin B. Cefaclor C. Ceftiofur D. Cefepime

51.Which drug is specifically used for the treatment of NSAID-induced gastric ulcers and is contraindicated during pregnancy?
A. Sucralfate B. Misoprostol C. Omeprazole D. Ranitidine

52.What is the primary mechanism of action of omeprazole?
A. Blocks H_2 receptors on parietal cells B. Neutralizes gastric acid directly C. Irreversibly inhibits the H^+/K^+-ATPase proton pump D. Coats the gastric mucosa

53.Which drug has both antiemetic and prokinetic properties?
A. Loperamide B. Metoclopramide C. Sucralfate D. Misoprostol

54.Which of the following drugs is used as an appetite stimulant in cats by acting as a serotonin antagonist and H_1 antihistamine?
A. Cyproheptadine B. Diazepam C. Prednisolone D. Maropitant

55.The main mechanism of action of benzimidazoles is:
A. Blocking neuromuscular transmission B. Inhibiting microtubule synthesis C. Inhibiting DNA replication D. Blocking calcium channels

56.Ivermectin works mainly by affecting:
A. GABA and glutamate-gated chloride channels B. DNA gyrase C. Protein synthesis D. Folic acid metabolism

57.Levamisole acts as a:
A. GABA agonist B. Nicotinic acetylcholine receptor agonist C. Muscarinic antagonist D. Sodium channel blocker

58.Piperazine causes paralysis of nematodes by:

A. Blocking acetylcholine release B. Activating GABA receptors C. Inhibiting ATP synthesis D. Blocking sodium channels

59.Which drug is a leukotriene receptor antagonist?

A. Dexamethasone B. Zafirlukast C. Atropine D. Codeine

60.Which antitussive is approximately 100 times more effective than codeine?

A. Dextromethorphan B. Hydrocodone C. Butorphanol D. Theophylline

61.What is the mechanism of action of theophylline?

A. β2-receptor blockade B. Phosphodiesterase inhibition leading to increased cAMP C. Leukotriene receptor blockade D. Histamine receptor antagonism

62.Which combination is considered the best treatment for Malassezia dermatitis?

A. Ketoconazole + Lime sulfur B. Miconazole + Chlorhexidine
C. Clotrimazole + Sulfur D. Selenium sulfide + Alcohol

63.Which adverse effect may occur with prolonged use of topical glucocorticoids?

A. Increased hair growth B. Skin atrophy C. Hyperpigmentation only
D. Improved wound healing

64.Cromolyn sodium acts by:

A. Blocking H1 receptors B. Blocking H2 receptors C. Preventing histamine release from mast cells D. Inhibiting histamine synthesis

65.Metoclopramide is classified as:

A. H2 blocker B. D2 antagonist and 5-HT4 agonist C. MAO inhibitor
D. Leukotriene antagonist

66.Leukotrienes (LTC4, LTD4, LTE4) are known for causing:

A. Vasodilation and bronchodilation B. Bronchoconstriction and increased mucus secretion C. Decreased vascular permeability D. Inhibition of inflammation

67.Which class of hormones is NOT absorbed orally due to GI degradation?

A. Steroid hormones B. Thyroid hormones C. Polypeptide hormones
D. Synthetic steroids

68.Steroid hormones are mainly transported in blood:

A. Free in plasma B. Bound to albumin and globulins C. Inside red blood cells
D. Stored in platelets

69.Which hormone class has the longest half-life and crosses cell membranes easily?

A. Polypeptides B. Glycoproteins C. Steroid and thyroid hormones
D. Catecholamines

70.Trimethoprim works by inhibiting:

A. DNA gyrase B. Dihydrofolate reductase C. RNA polymerase D. Cell wall synthesis

71.Mechanisms of drug permeation Except:

A. Aqueous diffusion B. Aqueous hydrolysis C. Lipid diffusion D. Pinocytosis or endocytosis

72.A physical process by which a weak acidecomes less water-soluble and more lipid-soluble at low pH is:

A. Distribution B. First-pass effect C. Protonation D. Elimination

73.Dose-response curves are used for drug evaluation in the animal laboratory and in the clinic, Quantal dose-response curves are often:

A. Used for determining the therapeutic index of a drug B. Used for determining the maximal efficacy of a drug C. Invalid in the presence of inhibitors of the drug being studied D. Obtained from the study of intact subject but not from isolated tissue preparations

74.Which of the following terms best describes an antagonist that interacts directly with the agonist and not at all or only incidentally, with the receptor?

A. Pharmacological antagonist B. Partial agonist C. Physiological antagonist D. Chemical antagonist

75.The pH value is calculated mathematically as the:

A. Log of the hydroxyl ion (OH–) concentration B. Negative log of the OH– concentration C. Log of the hydrogen ion (H+) concentration D. Negative log of the H+ concentration

76.All the following statements about plasma protein binding of a drug are true except:

A. Displacement of a drug from plasma protein binding sites results in a transient increased volume of distribution (VD) B. Displacement of a drug from plasma protein binding sites makes more free drug available for glomerular filtration C. Displacement of a potent drug that is normally more than 95% bound may cause toxicity D. Drugs that are highly bound to plasma proteins generally have a greater VD compared with drugs that are highly bound to tissue proteins

77.Alkalinization of urine hastens the excretion of:

A. Weakly basic drugs B.Weakly acidic drugs C. Strong electrolytes D.Nonpolar drugs

78.Bioavailability of drug refers to:

A. Perecentage of administered dose that reaches systemic circulation in the unchanged form B. Rario of oral to parental dose C. Ratio of orally administered drug to that excreted in the faeces D. Ratio of drug excreted unchanged in urineto that excreted as metabolites

79.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

80.Induction of drug metabolizing enzymes involves

A. A conformational change in the enzyme rotein to favor binding of substrate molecules B. Expression of enzyme molecules on the surface of hepatocytes C. Enhanced transport of substrate molecules into hepatocytes D. Increased synthesis of enzyme protein

81. '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

82.The therapeutic index of a drug is a measure of its:

A. Safety B. Efficacy C. Potency D. Dose variability

83.Intramuscular route:

A. Always produces faster absorption than oral route B. Can be used to inject mild irritants C. In a child is made into the gluteus maximus muscle D.Can be used to inject a volume of 15 ml

84.First pass metabolism:

A. Can increase the oral bio-availability of the drug B.Occurs only in the liver C. Is higher on intravenous administration D. Necessitates high oral dose for certain drugs

85.pKa of a compound:

A. Is the pH of solution at which the compound is 50% ionized B. Is the pH of compound at which it is 50% ionized C. Is the time in which the compound is ionized D. Is the time in which total compound is ionized

86.In presence of competitive antagonist:

A. The maximum response of agonist can never be achieved B. The maximum can be achieved by increasing the concentration activity C.Maximum can be achieved only if the antagonist is having intrinsic activity D.None of the above

87.Beta blockers are contraindicated in patients with which condition?

A. Asthma B.Diabetes mellitus C.Hypertension D.Rheumatoid arthritis

88.Beta agonists are commonly prescribed for the management of:

A. Hypertension B. Hyperthyroidism C. Asthma and COPD D. Diabetes mellitus

89.Increased heart rate and dilated pupils are associated with the activation of the:

A. Sympathetic nervous system B.Parasympathetic nervous system C. Both systems D. None of the above

90.The parasympathetic nervous system is most active during:

A. Stressful situations B. Rest and digestion C. Physical activity D.Fight responses

91.Which of the following is a typical effect of the parasympathetic nervous system activation?

A. Increased heart rate B. Dilation of bronchioles C. Pupil dilation D. Increased digestion

92.Which of the following is a characteristic of the sympathetic nervous system's response to stress?

A.Increased salivation B. Increased blood flow to digestive organs C.Dilation of pupils D.Decreased heart rate

93.What is the primary effect of alpha-1 receptor activation?

A. Vasodilation B.Decreased heart rate C. Vasoconstriction D. Increased cardiac output

94.Which alpha blocker drug is commonly used to treat hypertension and glaucoma?

A. Clonidine B.Prazosin C. Phenylephrine D.Dobutamine

95.Which of the following is a long-acting beta-2 agonist commonly used in the management of asthma and COPD?

A. Albuterlol B. Salmeterol C. Epinephrine D.Terbutaline

96.Which alpha blocker is often used to manage symptoms of benign prostatic hyperplasia (BPH)?

A. Atenolol B. Tamsulosin C. Lisinopril D. Metoprolol

97. What is the primary neurotransmitter deficiency associated with Parkinson's disease?

A. Serotonin B. Dopamine C. Acetylcholine D. Norepinephrine

98. What is the primary role of acetylcholine in the nervous system?

A. Muscle contraction B. Digestion C. Blood clotting D. Vision

99. What is a common side effect of atropine overdose?

A. Hypertension B.Hypoglycemia C. Bradycardia

D. Dry mouth and blurred vision

100. Which beta blocker is commonly used in the treatment of angina and post-myocardial infarction?

A. Propranol B. Metoprolol C. Atenool D. Nebivool

101. Toxicities of local anaesthetics do not include:

A. Cardiovascular arrhythmias and collapse (bupivacaine) B. Convulsions (lidocaine) C. Dizziness, sedation (lidocaine) D. Hypertensive emergencies, strokes (procaine)

102. Which one of the following statements best describes the mechanism of actionof benzodiazepines?

A. Benzodiazepines activate GABAB receptors in the spinal cord

B. Their inhibition of GABA transminase leads to increased levels of GABA

C. Benzodiazepines block glutamate receptors in hierarchical neuronal pathways in the brain D. They increase the frequency of opening of chloride ion channels that are coupled to GABAA receptors

103. The most likely mechanism involved in the antiseizure activity of carbamazepine is:

A. Block of sodium ion channels B. Block of calcium ion channels

C. Facilitation of GABA actions on chloride ion channels D. Glutamate receptor antagonism

104. Which of the following statements about nerve blockade with local anaesthetics is most correct?

A. Block is faster in onset in infected tissues B. Block is faster in onset in unmyelinated fibers C. Block is slower in onset in hypocalcemia

D. Block is faster in onset in hyperkalemia

105. Which of the following benzodiazepines is used mainly for hypnosis?

A. Clonozepam B. Lorazepam C.Flurazepam D. Midazolam

106. Which of the following hypnotic drugs is used intravenously as anesthesia?

A. Thiopental B. Phenobarbital C. Flurazepam D. Zolpidem

107. Indicate an antiseizure drug, which has an impotent effect on the T-type calcium channels in thalamic neurons?

A. Carbamazepin B. Lamotrigine C. Ethosuximide D. Phenytoin

108. Which of the following antiseizure drugs produces a voltage-dependent inactivation of sodium channels?

A. Lamotrigine B. Carbamazepin C. Phenytoin D. All of the above

109. Which of the following agents is the precursor of dopamine?

A. Bromocriptine B. Levodopa C. Selegiline D.Amantadine

110. Mu (μ) receptors are associated with:

A. Analgesia, euphoria, respiratory depression, physical dependence B. Spinal analgesia, mydriasis, sedation, physical dependence C.Dysphoria, hallucinations, respiratory and vasomotor stimulation D. Analgesia, euphoria, respiratory stimulation, physical dependence

111. Which of the following agents is a full antagonist of opioid receptors?

A. Meperidine B. Buprenorphine C. Naloxone D. Butorphanol.

112. Non-narcotic analgesics are mainly effective against pain associated with:

A. Inflammation or tissue damage B. Trauma
C. Myocardial infarction D. Surgery

113. All of the following statements regarding cardiac glycosides are true EXCEPT:

A. They inhibit the Na+/K+-ATPase and thereby increase intracellular Ca++ in myocardial cells B. They cause a decrease in vagal tone C. Children tolerate higher doses of digitalis than do adults D. The most frequent cause of digitalis intoxication is concurrent administration of diuretics that deplete K+

114. This drug is useful for treating heart failure because it increases the inotropic state and reduces afterload:

A. Amiodarone B. Amrinone C. Propanolol D. Enalapril

115. Which of the following cardiovascular system effects refers to a calcium channel blocker?

A. The reduction of peripheral vascular resistance B. The reduction of cardiac contractility and, in some cases, cardiac output C. Relief of coronary artery spasm D. All of the above

116. Which of the following antianginal agents is a potassium channel opener:

A. Dipyridamole B.Validol C.Atenolol D. Minoxidil

117. Tick the diuretic agent – aldosterone antagonist:

A. Furosemide B.Spironolactone C.Dichlothiazide D. Captopril

118. Non-narcotic agents cause:

A. Respiratory depression B.Antipyretic effect
C.Euphoria D. Physical dependence

119. Which one of the following non-narcotic agents inhibits mainly cyclooxygenase (COX) in CNS?
A. Paracetamol B.Ketorolac C. Acetylsalicylic acid D.Ibuprofen

120. Patients taking chronic doses of nonselective nonsteroidal anti-inflammatory drugs (NSAIDs) should periodically be screened for which of the following toxicities?
A. Nephrotoxicity B.Peripheral neuropathy C.Cardiotoxicity D. All of the above

121. What is the primary function of hemoglobin?
A. Regulation of blood clotting B. Transport of oxygen in the blood C. Production of antibodies D. Regulation of blood pressure

122. Which type of white blood cell is the most abundant in normal blood?
A. Eosinophils B. Basophils C. Neutrophils D.Monocytes

123. Which hormone stimulates red blood cell production?
A. Insulin B.Erythropoietin C. Calcitonin D. Heparin

124. What is the average lifespan of a red blood cell?
A. 30 days B. 60 days C.90 days D. 120 days

125. Which element is essential for hemoglobin synthesis?
A. Calcium B. Iron C. Sodium D. Magnesium

126. Which clotting factor is known as fibrinogen?
A. Factor I B. Factor II C. Factor V D. Factor VIII

127. Which organ is the primary site for destruction of aged red blood cells?
A. Lung B.Kidney C. Spleen D. Pancreas

128. What is the primary function of platelets?
A. Oxygen transport B. Antibody production C. Primary hemostasis D. Blood glucose regulation

129. Vitamin B12 deficiency commonly causes:
A. Microcytic anemia B. Macrocytic anemia
C. Polycythemia D. Thrombocytosis

130. Which blood group is considered the universal donor for red blood cells?
A. A B. B C. AB D. O

131. Which hormone lowers blood glucose concentration?
A. Cortisol B. Glucagon C. Insulin D. Epinephrine

132. Growth hormone is secreted from the:
A. Posterior pituitary gland B.Anterior pituitary gland C. Thyroid gland D. Pancreas

133. Which hormone increases water reabsorption in the kidneys?
A. ACTH B. TSH C. ADH D. GH

134. Which hormone is primarily responsible for decreasing blood calcium levels?
A. Parathyroid hormone (PTH) B. Calcitonin
C. Cortisol D. Aldosterone

135. Increased secretion of aldosterone results in:
A. Increased sodium excretion B. Decreased blood pressure C.Increased sodium and water retention D. Decreased blood volume

136. What is the basic functional unit of the nervous system?
A. Glial cell B. Neuron C.Endothelial cell D. Platelet

137. Which ion enters the nerve fiber during the initial phase of the action potential?
A. Potassium B. Calcium C. Chloride D. Sodium

138. Which part of a neuron is primarily responsible for receiving signals?
A. Axon B. Cell body only C. Dendrites D. Myelin sheath

139. Which neurotransmitter is released at the neuromuscular junction?
A. Dopamine B. Serotonin C. Acetylcholine D. Norepinephrine

140. What is the main function of the myelin sheath?
A. Production of neurotransmitters B. Increase the speed of nerve impulse conduction C. Formation of synapses D) Protein synthesis

141. Which hormone is secreted by pancreatic β-cells؟
A. Glucagon B. Cortisol C. Insulin D. Epinephrine

142. A low Km value indicates:
A. Low substrate affinity B. High substrate affinity C. Low enzyme activity D. Complete inhibition

143. The primary second messenger in glucagon signaling is:
A. ATP B. ADP C. cAMP D. NADH

144. In competitive inhibition, the inhibitor:
A. Binds to the active site B. Binds irreversibly to the enzyme
C. Destroys the substrate D. Increases Vmax

145. During prolonged fasting, the brain increasingly utilizes:
A. Glycogen B. Amino acids C. Free fatty acids
D. Ketone bodies

146. Allosteric regulation occurs when:
A. A regulator binds to a site other than the active site B. The substrate concentration decreases C. The enzyme is degraded
D. ATP is consumed

147. Increased ATP levels in pancreatic β-cells cause:
A. Opening of K^+ channels B. Closure of K^+ channels
C. Decreased insulin secretion D. Increased glucagon secretion

148. Which of the following is NOT changed by an enzyme؟

A. Reaction rate B. Activation energy
C. Equilibrium constant D. Rate of product formation

149. Which hormone stimulates glycogen breakdown in the liver؟

A. Insulin B. Glucagon C. Calcitonin D. Prolactin

150. When all active sites of an enzyme are occupied by substrate, the reaction reaches:

A. Km B. KI C. Vmax D ΔG

Questions comitee :

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