41. A woman is taking an oestrogen-progestogen combination oral contraceptive. She experiences a multitude of side effects. Which of the following side effects is most likely due to what can be described as an "oestrogen excess," and not likely due to the progestogen component of the medication?
    A. Fatigue
    B. Hypomenorrhea
    C. Hypertension
    D. Increased appetite

42. Which of the following is the mechanism of action of tadalafil in erectile dysfunction?
    A. Inhibition of phosphodiesterase-5
    B. Activation of nitric oxide synthase
    C. Blocks alpha-adrenergic receptors
    D. Activates testosterone receptors

43. Which of the following statements is true concerning drugs that affect oestrogen receptors?
    A. Tamoxifen is a pure antagonist at all oestrogen receptors
    B. Clomiphene increases gonadotrophin release
    C. Clomiphene has full agonist activity on oestrogen receptors in all tissues
    D. Fulvestrant has agonist activity on estrogen receptors in the breast

44. Which of the following drugs is used in the treatment of anovulatory infertility?
    A. Mifepristone
    B. Dinoprostone
    C. Cyproterone
    D. Clomiphene

45. Which of the following is correctly matched to the action and clinical indication:
    A. Nandrolone - androgen receptor antagonist: Benign prostate hypertrophy
    B. Flutamide – androgen receptor agonist: Male hypogonadism
    C. Levonorgestrel – oestrogen receptor agonist: Hirsutism
    D. Anastrazole - aromatase inhibitor: Breast cancer

46. A 23-year-old woman complained to her physician that the diphenhydramine she used to prevent motion sickness when travelling by boat was effective in preventing vomiting but caused drowsiness and dry mouth. Which of the following terms best explains the underlying cause of these drug-related unwanted effects?
    A. Genetic predisposition
    B. Drug-receptor interaction
    C. Non-specific cytotoxicity
    D. Immunologic response

93. A 4-year-old boy diagnosed with Wilms tumour underwent surgery, followed by 18 weeks of vincristine and dactinomycin therapy. Which of the following molecular actions most likely mediated the therapeutic effect of dactinomycin in the patient's disease?
   A. Alkylation of nucleophilic groups on RNA bases
   B. Inhibition of dihydrofolate reductase
   C. Inhibition of pyrimidine biosynthesis
   D. Binding to double-stranded DNA

94. All of the following antibiotics inhibit the protein synthesis in bacterial cells, EXCEPT:
   A. Macrolides
   B. Glycopeptides
   C. Aminoglycosides
   D. Tetracyclines

95. Which of the following would be the best choice for empirical treatment of urethral discharge syndrome?
   A. Benzathine penicillin
   B. Gentamicin
   C. Levofloxacin
   D. Ceftriaxone

96. In treatment of peptic ulcer, cytoprotection is provided by which of the following drugs?
   A. Ranitidine
   B. Magnesium trisilicate
   C. Omeprazole
   D. Misoprostol

97. The following laxative also has a role in management of hepatic encephalopathy:
   A. Magnesium sulphate
   B. Lactulose
   C. Bisacodyl
   D. Docusate sodium

98. Stimulant purgatives are avoided:
   A. In constipated pregnant women
   B. Prior to colonoscopy
   C. Prior to colon surgery
   D. Prior to radiography of abdomen

99. The following classes of drugs are used in gastro oesophageal reflux disease EXCEPT:
   A. Serotonin 5-HT_3 blockers
   B. Proton pump inhibitors
   C. Histamine H_2 blockers
   D. Prokinetic drugs

147. A 47-year-old man developed increasing ectopic beats followed by sustained tachycardia after being admitted to the coronary unit following a myocardial infarction. An electrocardiogram showed a frequency of 175 bpm, wide QRS complexes, and atrioventricular dissociation. He was given an intravenous infusion of an anti-arrhythmic drug that restored the normal sinus rhythm, but 1 hour later the patient showed increased agitation, loss of coordination, confusion, slurred speech, nystagmus, trembling, and muscle twitching. Which of the following drugs was most likely administered?

A. Lignocaine
B. Phenytoin
C. Sotalol
D. Mexiletine

148. A 24-year-old man complained to his family physician of episodes of precordial pain precipitated by exertion and relieved by rest. The man had been recently diagnosed with hypertrophic cardiomyopathy. Which of the following pairs of drugs would be appropriate for this patient?

A. Isosorbide mononitrate and nifedipine
B. Isosorbide mononitrate and metoprolol
C. Nitroglycerin and verapamil
D. Verapamil and metoprolol

149. Which of the following medications inhibits cholesterol absorption at small intestine brush border?

A. Colestipol
B. Ezetimibe
C. Fenofibrate
D. Niacin

150. Which of the following drugs should NOT be initiated in case of acute decompensated heart failure?

A. Digoxin
B. Caverdilol
C. Lisinopril
D. Frusemide

139. A 58-year-old man complained to his physician of severe chest pain when he walked rapidly despite the therapy he had carefully followed for 3 weeks. The man was recently diagnosed with exertional angina and had started treatment with transdermal nitroglycerin and atenolol. The physician decided to add a drug and prescribed diltiazem. Which of the following effects was most likely common to all the drugs the patient was taking?

A. Decreased cardiac rate
B. Increased cardiac contractility
C. Decreased arterial pressure
D. Decreased left ventricular end-diastolic volume

140. A 50-year-old woman was admitted to the hospital with a 3-week history of early morning chest pain that caused her to awaken from sleep. The pain lasted 10 to 15 minutes and frequently radiated to her left arm. An exercise tolerance test failed to elicit precordial pain. A diagnosis of angina was made, and she was discharged from the hospital with a prescription for nifedipine. Which of the following actions most likely mediated the therapeutic effect of the drug in the patient's disease?

A. Decreased preload
B. Decreased afterload
C. Decreased coronary vascular tone
D. Increased myocardial contractility

141. A 35-year-old woman in her 29th week of gestation was found to have a positive direct Coombs test during a routine prenatal visit. Two months after she became pregnant, she was diagnosed with Stage-1 hypertension and started an antihypertensive therapy. Which of the following drugs was she most likely taking?

A. Nifedipine
B. Prazosin
C. Losartan
D. Methyldopa

142. A 61-year-old man recently diagnosed with stage C heart failure was admitted to the hospital for evaluation. It was found that he had an ejection fraction of 30% at rest. A treatment that included digoxin was started. Which of the following cardiovascular parameters did digoxin most likely increase in this patient?

A. Total peripheral resistance
B. Oxygen consumption of the heart
C. End-diastolic volume
D. Stroke volume

D. Fraction of drug undergoing pre-systemic metabolism following the oral route of administration

20. Which of the following processes proceeds in the second phase of biotransformation?
    A. Reduction
    B. Oxidation
    C. Hydrolysis
    D. Acetylation

21. A 42-year-old woman, recently diagnosed with lupus erythematosus, started a therapy with high-dose dexamethasone. Which of the following best explains why synthetic glucocorticoids are usually preferred over cortisol in the therapy of non-endocrine disorders?
    A. Lack of ulcerogenic activity
    B. Less prone to induce myopathy
    C. Less prone to induce sodium and water retention
    D. Less prone to induce opportunistic infections

22. Which of the following controls the secretion of thyrotropin?
    A. Concentration of iodine in the thyroid gland
    B. Concentration of thyroid hormone in the blood
    C. Concentration of thyroid hormones in the thyroid gland
    D. Concentration of thyrotropin in the pituitary gland

23. A single injection of leuprolide depot preparation was given to a man 2 weeks ago. Which of the following changes could be revealed today?
    A. Increased testosterone production
    B. Decreased testosterone production
    C. Increased follicle stimulating hormone receptors
    D. Increased luteinizing hormone receptors

24. Which of the following benefits is achieved as a result of adding a progestogen to oestrogen in hormone replacement therapy?
    A. Decreased bone resorption
    B. Decreased occurrence of endometrial cancer
    C. Decreased effect of oestrogen on the breast
    D. Increased effect of oestrogen on the heart

25. We prescribe bromocriptine for a woman with primary amenorrhea. Normal menstruation returns about a month after starting therapy. Which of the following statements best describes the mechanism by which bromocriptine caused its desired effects?
    A. Increased follicle-stimulating hormone synthesis
    B. Inhibited prolactin release
    C. Stimulated ovarian estrogen and progestin synthesis
    D. Stimulated gonadotropin-releasing hormone release

Which of the following diuretics are correctly matched to the given clinical indications?

A. Hydrochlorothiazide: Myxoedema
B. Spironolactone: Primary aldosteronism
C. Frusemide: Angioneurotic oedema
D. Triamterene: Papilloedema

134. Which of the following diuretics are correctly matched to the given adverse effects?

A. Spironolactone: metabolic alkalosis
B. Hydrochlorothiazide: hyper-uricaemia
C. Amiloride: hypokalaemia
D. Frusemide: metabolic acidosis

135. Which of these is not an action of angiotensin converting enzyme inhibitors on the cardiovascular system?

A. They reduce preload
B. They reduce peripheral vascular resistance
C. They increase afterload
D. They improve left ventricular systolic function

136. What are the adverse effects of angiotensin converting enzyme inhibitors on electolytes and acid-base balance?

A. Hyperkalemia and acidosis
B. Hypokalemia and acidosis
C. Hyperkalemia and alkalosis
D. Hypokalemia and alkalosis

137. Which of the following is a potential detrimental effect of organic nitrates in the prophylactic treatment of exertional angina?

A. Decreased ejection time
B. Increased cardiac rate
C. Increased capacitance of systemic veins
D. Decreased arterial pressure

138. A 33-year-old woman with known hypertension is now 2 weeks' pregnant. Which of the following antihypertensive drug classes is absolutely contraindicated in this woman?

A. Ca^{2+} channel blockers
B. $Alpha_1$ adrenergic blockers
C. Central sympatholytics
D. Angiotensin-converting enzyme inhibitors

114. Which of these drugs is given orally and produces its anti-coagulant effects by inhibiting factor Xa?
A. Dabigatran
B. Apixaban
C. Warfarin
D. Clopidogrel

115. Which of the following statements is NOT true about dabigatran?
A. Its elimination is dose related and exhibits wide inter-individual variability
B. It acts by inhibiting thrombin
C. It is indicated for treatment of venous thrombo-embolism
D. It is given orally

116. Which of the following is most likely to produce renal impairment when given at therapeutic doses?
A. Paracetamol
B. Colchicine
C. Probenecid
D. Indomethacin

117. Which of the following agents is used to maintain patency of the ductus arteriosus?
A. Indomethacin
B. Epoprostenol
C. Celecoxib
D. Alprostadil

118. How does diphenylhydramine produce drowsiness?
A. It blocks serotonin 5-HT6 receptors in the brain
B. It is an agonist on muscarinic receptors in the brain
C. It blocks histamine H1 receptors in the brain
D. It stimulates the release of prostaglandins in the brain

119. Which of the following drugs would be more appropriate for the treatment of allergic rhinitis in a man whose occupation is a long-haul truck driver?
A. Fexofenadine
B. Promethazine
C. Diphenhydramine
D. Hyoscine

120. Which of the following agents can be used in the management of postpartum haemorrhage?
A. Aspirin
B. Carboprost
C. Epoprostenol
D. Metoclopramide

127. A 50-year-old male presents with striking hypertriglyceridemia, after about 6 months of drug treatment his 'triglyceride and VLDL cholesterol' levels dropped dramatically but his 'HDL cholesterol' levels had doubled. This phenomenon is commonly seen with:

A. Niacin
B. Lovastatin
C. Gemfibrozil
D. Ezetimibe

128. A 57-year-old man complained of dizziness and palpitations shortly after taking a tablet of his prescribed medication. The man was recently diagnosed with variant angina for which he had started an appropriate therapy 4 days earlier. Which of the following actions most likely caused the patient's symptoms?

A. Decreased total peripheral resistance
B. Coronary vasodilation
C. Increased venous return to the heart
D. Decreased myocardial contractility

129. Which two groups of drugs used in the management of hypercholesterolaemia are associated with myositis?

A. Fibrates and bile acid binding resins
B. Statins and ezetimibe
C. Fibrates and nicotinic acid
D. Statins and fibrates

130. A 65-year-old Black woman recently diagnosed with stage 1 essential hypertension started a treatment with a thiazide diuretic. Which of the following molecular mechanisms is most likely to mediate the long-term antihypertensive effect of the thiazide drug in this patient?

A. Increased nitric oxide release from vascular endothelium
B. Decreased potassium in the extracellular fluid
C. Increased cyclic guanosine monophosphate in smooth muscle cells
D. Decreased sodium in smooth muscle cells

131. In a patient with Addison's disease, which class of diuretic agents would not have any diuretic effect?

A. Loop diuretics
B. Amiloride
C. Spironolactone
D. Thiazide diuretics

132. Which of the following is CORRECT concerning actions/effects of diuretics?

A. Thiazide diuretics: inhibit sodium/chloride co-transport in the distal convoluted tubule
B. Mannitol: inhibits sodium/potassium/chloride co-transport in the loop of Henle
C. Acetazolamide: increases bicarbonate in blood
D. Frusemide: inhibits renal prostaglandins

82. All of the following antifungal drugs is correctly matched to the anti-fungal mechanism of action:
   A. Fluconazole: Inhibits ergosterol synthesis
   B. Capsofungin: Inhibits fungal DNA synthesis
   C. Flucytosine: Disrupts fungal cell membrane functions
   D. Terbinafine: Inhibits fungal mitosis

83. Which of the following drugs is correctly matched to the given indication
   A. Praziquantel: Toxoplasmosis
   B. Di-ethyl-carbamazine: Schistosomiasis
   C. Eflornithine: Meningo-encephalitic trypanosomiasis
   D. Diloxanide furoate: Amoebic hepatic abscess

Zz

84. Which of the following anti-malaria drugs is correctly matched to the mechanism of anti-malarial action?
   A. Artesunate – inhibits haem polymerase
   B. Clindamycin – inhibits DNA synthesis
   C. Atovaquone – inhibits electron transport chain in the mitochondria
   D. Proguanil – inhibits calcium ATPase

85. Which of the following is correctly matched to the given drug therapy?
   A. Neurocysticercosis: Mebendazole
   B. Plasmodium vivax relapse prevention: Atovaquone-proguanil
   C. Severe P. falciparum malaria: Artesunate
   D. Luminal entamoeba histolytica: Tetracycline

86. A 35-year-old man with AIDS started a therapy that included a combination of lopinavir–ritonavir. Which of the following statements best explains the main reason for this combination regimen?
   A. Lopinavir enhances ritonavir intestinal absorption
   B. Ritonavir prevents lopinavir resistance
   C. Ritonavir inhibits lopinavir metabolism
   D. Ritonavir enhances lopinavir intestinal absorption

87. A 30-year-old man with AIDS presented to the clinic complaining of recent weight gain. The man had been using a highly active antiretroviral therapy for 6 months. Physical examination showed a patient with truncal obesity and cushingoid appearance. Lab tests revealed hyperglycemia and hyperlipidemia. A drug from which of the following anti-retroviral drug classes most likely caused these adverse effects?
   A. Protease inhibitors
   B. Entry inhibitors
   C. Nucleoside reverse transcriptase inhibitors
   D. Integrase inhibitors

107. Indications for warfarin INCLUDE:
A. To avoid the recurrences of myocardial infarction
B. Prevention of pulmonary embolism and venous thrombosis
C. Cerebrovascular accident
D. Retinal artery thrombosis

108. Indications for tranexamic acid INCLUDE:
A. Acute myocardial infarction
B. Heart failure
C. Bleeding from fibrinolytic therapy
D. Multiple pulmonary emboli

109. Indications for recombinant human erythropoietin INCLUDE:
A. Haemolytic anaemia
B. Megaloblastic anaemia
C. Anaemia in patients with chronic renal failure
D. Anaemia in patients with thalassemia

110. Low molecular weight heparins have the following advantages over unfractionated heparin EXCEPT
A. Higher efficacy in arterial thrombosis
B. Less frequent dosing
C. Higher and more consistent subcutaneous bioavailability
D. Laboratory monitoring of response not required

111. Which of the following condition is correctly matched to the given drug?
A. Sideroblastic anaemia: Filgrastim
B. Reduction of sickling crises in sickle cell disease: Pyridoxine
C. Anti-dote to iron overdose: Hydoxyurea
D. Cancer chemotherapy induced thrombocytopaenia: Oprelvekin

112. Which of these iron preparations is most likely to cause an anaphylactoid reaction?
A. Iron-sucrose complex
B. Iron-sodium gluconate complex
C. Iron dextran
D. Ferrous sulphate

113. Which of these drugs would be most appropriate for the treatment of vitamin K deficiency occurring in biliary obstruction?
A. Phytomenadione
B. Menaquinone
C. Warfarin
D. Menadiol

100. Suggested features of oral rehydration salts for maximal water absorption in the gut include:
A. Osmolarity in the range of 200 – 300 mOsm/L
B. Sodium of 20 mEq/L
C. Potassium of about 75 mEq/L
D. Glucose:sodium ratio of 3:1

101. The following statements about leukotriene receptor antagonists as anti-asthmatics are true, EXCEPT:
A. They can safely be combined with inhaled glucocorticoids
B. They are administered orally
C. As bronchodilators, they are more efficacious than salbutamol as bronchodilators
D. They have moderate anti-inflammatory activity

102. The following statements are true about salbutamol, EXCEPT:
A. Cardiac side effects are less prominent
B. It is suitable for round the clock prophylaxis in patients of asthma
C. Muscle tremors are a dose related side effect
D. It produces rapid onset of bronchodilatation on inhalation

103. Following statements are true about theophylline, EXCEPT:
A. It inhibits phosphodiesterase enzyme in bronchi
B. It stimulates adenosine receptors in bronchi
C. It exhibits variability in metabolism
D. Its metabolism can be inhibited by cimetidine

104. An elderly man with chronic obstructive pulmonary disease (COPD), is managed with several drugs, one of which is inhaled ipratropium. What is the main mechanism that accounts for the beneficial effects of this drug?
A. Enhances epinephrine release from the adrenal medulla
B. Inhibits cAMP breakdown via phosphodiesterase inhibition
C. Blocks receptors upon which an endogenous bronchoconstrictor mediator acts
D. Prevents antigen-antibody reactions that lead to mast cell mediator release

105. Which of the following acts as an expectorants through reflexly increasing bronchial secretions?
A. Guaiphenesin
B. Bromhexine
C. Sodium citrate
D. Acetylcysteine

106. In a patient who requires long term anti-coagulation with heparin, but develops heparin induced thrombocytopaenia, what alternative would you consider?
A. Clopidogrel
B. Aspirin
C. Eptifibatide
D. Lepirudin

121. Which of the following drugs can be used to treat diarrhea and intestinal spasms produced by serotonin-secreting carcinoid tumours?
A. Ondansetron
B. Metoclopramide
C. Cyproheptadine
D. Acrivastine

122. A 25 year old female is given dinoprostone to induce labour. Which eicosanoid does dinoprostone represent?
A. PGE_2
B. $PGF_{2\alpha}$
C. PGD_2
D. PGI_2

123. Which of the following is TRUE regarding infliximab?
A. It is a soluble TNF-α receptor
B. It inhibits the binding of antigen presenting cells to T cells thereby inhibiting the activation of T cells
C. It inhibits interleukin-1
D. It is an antibody to TNF-α

124. Which of the following is most useful in an acute gout attack?
A. Allopurinol
B. Colchicine
C. Rasburicase
D. Probenecid

125. Which of the following statement concerning gold salts is CORRECT?
A. They frequently cause dermatitis and mucositis
B. They must all be given intramuscularly
C. They are the drugs of first choice in rheumatoid arthritis
D. They provide immediate relief of arthritic pain

126. A 63-year-old woman recently diagnosed with systolic heart failure started a treatment with furosemide and captopril. Plasma levels of which of the following pairs of compounds were most likely increased after the administration of captopril?
A. Vasopressin and sodium
B. Norepinephrine and angiotensin II
C. Bradykinin and angiotensin I
D. Atrial natriuretic peptide and serotonin

88. Which of the following is the mechanism of herpes simplex virus resistance to acyclovir?
   A. Mutation of aspartate protease
   B. Viral transpeptidase deficiency
   C. Viral neuraminidase deficiency
   D. Viral thymidine kinase deficiency

89. Which of the following is correctly matched to the anti-viral mechanism of action?
   A. Enfuvirtide: Inhibits reverse transcriptase
   B. Maraviroc: Inhibits CCR5 receptor
   C. Atazanivir: Inhibits viral uncoating
   D. Abacavir: Inhibits proteolytic cleavage

90. A 61-year-old man was found to have recurrent colon cancer. The primary tumor was removed 8 months previously, at which time adjuvant chemotherapy with fluorouracil and carboplatin was begun. The oncologist suspected that the cancer recurrence was related to resistance to fluorouracil. Which of the following mechanisms best explains the resistance to this drug?
   A. Decreased ability to phosphorylate pyrimidines
   B. Decreased activity of the cell efflux pump
   C. Increased intracellular concentration of a reduced folate
   D. Decreased activity of topoisomerase

91. A 26-year-old man complained of numbness in his fingers and the soles of his feet. Three weeks previously, he had started chemotherapy for acute lymphoblastic leukemia. Physical examination showed loss of ankle jerk and depression of deep tendon reflexes. Which of the following drugs most likely caused the patient's signs and symptoms?
   A. Vincristine
   B. Prednisolone
   C. Methotrexate
   D. Mercaptopurine

92. A 47-year-old woman recently diagnosed with acute myelogenous leukemia started remission chemotherapy with daunorubicin and cytarabine. Which of the following molecular actions most likely mediated the therapeutic effect of cytarabine in the patient's disease?
   A. Inhibition of topoisomerase II
   B. Inhibition of adenosine deaminase
   C. Inhibition of DNA chain elongation
   D. Inhibition of microtubule assembly

72. A patient with a Pseudomonas aeruginosa infection is receiving intravenous gentamicin. The aminoglycoside blood levels are well above the minimum inhibitory concentration, but the clinical response is not satisfactory. A new medication order calls for adding a penicillin, administered in separate IV lines to avoid a physical incompatibility. If this order is carried out, what is most likely to occur?
A. The aminoglycoside will inactivate the penicillin
B. The patient is likely to develop C difficile colitis (superinfection)
C. The risk of inducing resistance to both drugs increases dramatically
D. The penicillin will act synergistically with the aminoglycoside

73. A 22-year-old woman is wearing two hearing aids for binaural (bilateral) high-frequency hearing loss. You inquire about the possible reason(s) for this. She says she lost most of her hearing after receiving an antibiotic for a severe infection when she was 19, but cannot recall the specific drug. Which drug or drug class was most likely responsible for the ototoxicity?
A. First generation cephalosporin
B. Fluoroquinolone
C. Aminoglycoside
D. Penicillin

74. A 30-year-old man with AIDS was recently diagnosed with cytomegalovirus retinitis, and a therapy with ganciclovir was started. Two weeks later, the disease was not much improved, and the ophthalmologist decided to add a drug that, unlike ganciclovir, can directly inhibit DNA polymerase without requiring activation by phosphorylation. Which of the following drugs was most likely prescribed?
A. Acyclovir
B. Lopinavir
C. Foscarnet
D. Ribavirin

75. A 62-year-old man presented to the hospital complaining of anorexia, nausea and vomiting, and abdominal discomfort. He also had pain on motion and stiffness in several joints. The man, recently diagnosed with renal tuberculosis, started a four-drug combination regimen 1 month ago. Laboratory results showed serum aspartate aminotransferase of 280 U/L (normal 8–20 U/L) and serum uric acid of 25 mg/dL (normal 3.0–8.2 mg/dL). Which of the following drugs most likely caused the patient symptoms and signs?
A. Pyrazinamide
B. Rifampicin
C. Isoniazid
D. Ethambutol

76. A 28-year-old man underwent a tuberculin skin test (Mantoux method) that turned out to be positive. The man was the husband of a woman who had uncomplicated pulmonary tuberculosis treated at home with a multiple-drug regimen. The man was prescribed a drug to be taken daily for 6 months. Which of the following drugs was most likely given?

52. An Adverse Drug Reaction:
   A. Is always an extension of the pharmacological actions of a drug
   B. May sometimes be beneficial
   C. Only occurs when a patient is given an overdose
   D. Is always noxious and unintended

53. A good Adverse Drug Reaction Case Report should always include the following except:
   A. Name of the reporter
   B. Name of the patient
   C. Names of the medicines administered to the patient
   D. Description of the reaction

54. Features of Spontaneous Adverse Drug Reaction Reporting include:
   A. Targets specific groups of drugs
   B. Targets specific groups of patients
   C. Covers the whole population
   D. Is an active surveillance method

55. Which of the following treatments should be used in cases of methanol or ethylene glycol poisoning?
   A. Glucagon
   B. Pyridoxine
   C. Sodium bicarbonate
   D. Ethanol

56. Which of the following drugs is most likely to cause acute cholestatic hepatitis?
   A. Erythromycin
   B. Acarbose
   C. Metformin
   D. Colchicine

57. Which of the following is the most common cause of adverse drug effects?
   A. Allergic reaction
   B. Idiosyncrasy
   C. Dosage discrepancy
   D. Teratogenicity

58. Administration of clopidogrel with aspirin is an example of which of the following drug interactions?
   A. Additive
   B. Antagonistic
   C. Synergism
   D. Pharmacokinetic

47. Which of these medications is the drug of choice in treatment of severe digitalis intoxication?
A. Quinidine
B. Propranolol
C. Immune Fab
D. Adenosine

48. A child takes what comes close to being a lethal dose of paracetamol. What type of unwanted drug effect is described?
A. Toxic effect
B. Side effect
C. Untoward effect
D. Adverse drug reaction

49. A 23-year-old woman scheduled for surgical dilation and curettage was anaesthetised with thiopental. Shortly after recovery from the anaesthesia, the woman had generalised seizures followed by a deep coma. Further information given by her husband indicated that the patient's mother had suffered from acute intermittent porphyria. If the coma was caused by thiopental, which of the following drug reactions was most likely involved?
A. Idiosyncratic reaction
B. Type II allergic reaction
C. Delayed allergic reaction
D. Overdose toxicity

50. A 32-year-old woman complained to her physician of urticaria. Three days earlier, the woman had started therapy with amoxicillin for infectious tonsillitis. The physician suspected an allergic reaction to the drug. Which of the following was most likely the primary determinant of that drug reaction?
A. The dose of the drug
B. Genetic pedigree of the patient
C. Chemical structure of the drug
D. Liver and kidney functions of the patient

51. Which of the following terms is correctly matched to the given definition?
A. Adverse effect: Any harmful occurrence during treatment but that is not necessarily causally related to the treatment
B. Causality: The seriousness of an adverse drug event
C. Adverse event: Any untoward medical occurrence that may be present during treatment with a medicine but does not necessarily have a causal relationship with the treatment
D. Signal: A serious adverse event affecting a large proportion of patients taking a particular medicine

35. A 51-year-old man with a long history of severe type 2 diabetes had been on a pharmacotherapy that involved two different insulin formulations. Several available insulin formulations differ from one another primarily because of which of the following pharmacokinetic properties?
A. Rate of absorption
B. Elimination half-lives
C. Total clearance
D. Volume of distribution

36. A 66-year-old man suffering from type 2 diabetes had been receiving a combination therapy with metformin and glibenclamide, but 2 months later laboratory examinations indicated that the control of his diabetes was inadequate. His physician decided to add pioglitazone to the treatment regimen. Which of the following molecular actions most likely mediated the therapeutic effect of the added drug in the patient's disease?
A. Regulation of transcription of genes related to glucose utilization
B. Inhibition of incretin hormone metabolism
C. Activation of glucagon-like polypeptide-1 receptors
D. Activation of adenosine monophosphate–activated protein kinase

37. A 50-year-old obese woman with type 2 diabetes was found to have inadequate control of her disease 2 months after starting therapy with metformin and glibenclamide. The physician decided to add exenatide to the treatment regimen. Which of the following molecular actions most likely mediated the therapeutic effect of the added drug in the patient's disease?
A. Inhibition of dipeptidyl peptidase-4
B. Inhibition of α-glucosidase
C. Activation of glucagon-like polypeptide-1 receptors
D. Activation of adenosine monophosphate–activated protein kinase

38. Which of these insulin preparations is correctly matched to the duration of action?
A. Insulin determir: short acting
B. Soluble insulin: ultra-short acting
C. Insulin apart: long acting
D. Isophane insulin: intermediate acting

39. Which of the following is correctly matched with the indicated contraindication?
A. Metformin: obesity
B. Acarbose: intestinal obstruction
C. Glibenclamide: ischaemic heart disease
D. Pioglitazone: hypercholesterolaemia

40. Indications of alendronate include the following EXCEPT:
A. Glucocorticoid-induced osteoporosis
B. Paget's disease
C. Hypoparathyroidism
D. Syndromes of ectopic calcification

A. Rifampicin
B. Isoniazid
C. Ethambutol
D. Pyrazinamide

77. Which of these antimicrobial agents is most likely to cause aplastic anaemia?
A. Metronidazole
B. Nitrofurantoin
C. Erythromycin
D. Chloramphenicol

78. A 44-year-old woman complained of blurred vision and inability to distinguish green objects from red objects. The woman, recently diagnosed with cavitary pulmonary tuberculosis, had been receiving a four-drug combination regimen for 2 months. An eye examination indicated a narrowing of her visual field. Which of the following drugs most likely caused these adverse effects?
A. Isoniazid
B. Ethambutol
C. Pyrazinamide
D. Rifampicin

79. A 66-year-old man recently diagnosed with pulmonary tuberculosis started a four-drug treatment with isoniazid, rifampicin, pyrazinamide and ethambutol. The man, who had been suffering from atrial fibrillation for 4 years, was currently being treated with propranolol and warfarin. At this point, which of the following changes in the patient's therapeutic regimen would be appropriate?
A. Increase the dose of warfarin
B. Decrease the dose of propranolol
C. Add streptomycin to the current therapy
D. Substitute isoniazid with streptomycin

80. Which of the following anti-retroviral drugs is correctly matched to the mechanism of anti-retroviral action?
A. Zidovudine: non-competitive inhibitor of reverse transcriptase
B. Etravirine: integrase inhibitor
C. Enfuvirtide: entry inhibitor
D. Darunavir: nucleoside reverse transcriptase inhibitor

81. Which of the following statements is NOT TRUE about Ivermectin?
A. It is the most effective drug for strongyloidosis
B. It is drug of choice for onchocerciasis
C. It can be used to treat pediculosis
D. It is highly effective against plasmodium falciparum

66. A 25-year-old female patient received bethanechol several hours after her abdominal surgery, after effects of all the drugs used intraoperatively, except for morphine and ketorolac (analgesics), had worn off. The bethanechol caused her heart rate to fall slightly, and she experienced some wheezing. Which word or phrase most likely accounts for or describes these cardiac and pulmonary responses to bethanechol?
   A. Parasympathetic ganglionic activation
   B. Reflex (baroreceptor) suppression of cardiac rate
   C. Undiagnosed bronchial asthma
   D. Expected side effects

67. A 28-year-old woman has been treated with several autonomic drugs for about a month. Which of the following signs would distinguish between an overdose of a muscarinic blocker and a ganglionic blocker?
   A. Blurred vision
   B. Dry mouth, constipation
   C. Postural hypotension
   D. Mydriasis

68. Accepted therapeutic indications for the use of anti-muscarinic drugs include all of the following EXCEPT:
   A. Motion sickness
   B. Hypertension
   C. Parkinson's disease
   D. To produce cycloplegia

69. Which one of the following actions is produced by muscarinic cholinergic agonists?
   A. Activation of inhibitory G-protein
   B. Decreased inositol triphosphate production
   C. Decreased release of intracellular calcium
   D. Inhibition of phospholipase C

70. Which of the following differentiates neostigmine from pilocarpine?
   A. Acceleration of heart rate
   B. Prolonged skeletal muscle contraction
   C. Stimulation of bowel motility
   D. Stimulation of salivary glands

71. A patient has a severe bacterial infection that normally would respond to an oral penicillin or a cephalosporin. However, his chart documents anaphylactoid reactions to both drugs. Given the history, what drug would be preferred for treating the infection, and also poses the least risk of cross-reactivity and an allergic response?
   A. Clotrimazole
   B. Metronidazole
   C. Vancomycin
   D. Tetracycline

59. The antidote used in the treatment of paracetamol overdose is:
   A. N-acetylcysteine
   B. Sodium bicarbonate
   C. Propranolol
   D. Vitamin B12

60. Which of the following drug characteristics would render haemodialysis ineffective for accelerating drug elimination from the body?
   A. High tissue binding
   B. Low plasma protein binding
   C. High water solubility
   D. Low volume of distribution

61. Reflex bradycardia caused by alpha-1 adrenoceptor agonists is blocked by which of the following drugs?
   A. Adrenaline
   B. Metoprolol
   C. Phenylephrine
   D. Atropine

62. Which of the following actions of adrenaline is blocked by prazosin?
   A. Bronchodilatation
   B. Pupil dilatation
   C. Tachycardia
   D. High stroke volume

63. What intracellular effect does salbutamol produce?
   A. Allows passage of sodium through a ligand-gated ion channel
   B. Activates Gi protein resulting in inhibition of adenylyl cyclase
   C. Activates Gs protein, resulting in stimulation of adenylyl cyclase
   D. Increases intracellular calcium

64. The relaxation of gut smooth muscle by adrenergic stimulation is dependent upon which ion channel?
   A. Sodium
   B. Calcium
   C. Potassium
   D. Chloride

65. Which of these effects on the cardiovascular system is related to direct beta-1-adrenoreceptor stimulation?
   A. Bradycardia
   B. Vasodilatation
   C. Tachycardia
   D. Vasoconstriction

13. The volume of distribution (Vd) relates:
    A. Total clearance to elimination half-life
    B. Bioavailability to plasma protein binding
    C. Amount of the drug in the body to plasma volume
    D. Amount of a drug in the body to the concentration of a drug in plasma

14. In addition to slow intravenous infusion, which of the following routes of administration allows for titration of the dose of a drug with the response:
    A. Sublingual
    B. Transdermal
    C. Inhalational
    D. Nasal

15. Pick out the CORRECT statement
    A. Microsomal oxidation always results in inactivation of a compound
    B. Microsomal oxidation results in an increase of ionization and water solubility of a drug
    C. Microsomal oxidation results in a decrease of compound toxicity
    D. Microsomal oxidation results in an increase of lipid solubility of a drug thus its excretion from the organism is facilitated

16. Systemic clearance is related to:
    A. Only the concentration of substances in plasma
    B. Volume of distribution, elimination half-life and elimination rate constant
    C. Only the elimination rate constant
    D. Bioavailability and elimination half-life

17. The most important factor governing absorption of a drug from intact skin is:
    A. Molecular weight of the drug
    B. Site of application
    C. Lipid solubility of the drug
    D. Nature of the base used in the formulation

18. The main mechanism of most drugs absorption in GI tract is:
    A. Active transport (carrier-mediated diffusion)
    B. Filtration (aqueous diffusion)
    C. Endocytosis and exocytosis
    D. Passive diffusion (lipid diffusion)

19. What does the term "bioavailability" mean?
    A. Fraction of an uncharged drug reaching the systemic circulation following the oral route of administration
    B. Amount of unchanged drug reaching the systemic circulation following any route administration
    C. Fraction of an unchanged drug reaching the systemic circulation following any route administration

26. A patient has had his parathyroid glands excised during a total thyroidectomy. In addition to requiring supplemental thyroid hormone, interventions aimed at correcting hypoparathyroidism will be necessary. What is the main physiologic action or role of parathyroid hormone, one that necessitates suitable therapy?
    A. Decreases excretion of phosphate
    B. Decreases renal tubular reabsorption of calcium
    C. Increases mobilization of calcium from bone
    D. Decreases resorption of phosphate from bone

27. A woman goes into premature labour with concerns about inadequate fetal lung development and the risk of fetal respiratory distress syndrome. Terbutaline therapy is started to slow labour. Which other adjunct should be administered pre-partum, specifically for the purpose of reducing the risks and complications of the newborn's immature respiratory system development?
    A. Dexamethasone
    B. Salbutamol
    C. Ergometrine
    D. Indomethacin

28. A patient with Cushing disease is being treated by X-irradiation of the pituitary. It may take several months of this therapy for adequate symptomatic and metabolic improvement. Until that time, which of the following drugs would be administered to suppress adrenocortical glucocorticoid synthesis?
    A. Hydrocortisone
    B. Fludrocortisone
    C. Spironolactone
    D. Ketoconazole

29. A 30-year-old primipara woman had visible vaginal bleeding within a few hours after delivering her baby. Uterine massage and infusion of oxytocin did not control the bleeding. Upon examination, it was felt that the haemorrhage was due to uterine atony. An intramuscular injection of ergometrine (ergonovine) was given. Which of the following actions most likely mediated the therapeutic effect of the drug in this patient?
    A. Selective constriction of uterine arteries
    B. Endothelin release in the uterine vascular bed
    C. Induction of powerful uterine contracture
    D. Platelet aggregation in the uterine vascular bed

30. A 22-year-old woman with type 1 diabetes was brought unconscious to the emergency department. Her blood glucose level was 22 mmol/L (normal 3.5–6.5 mmol/L). An intravenous infusion of insulin was started, and 6 hours later the patient's blood glucose decreased to a norm al level. Which of the following molecular actions most likely contributed to the therapeutic effect of the drug in the patient's disorder?
    A. Inhibition of glucose transporters in pancreas cell membranes

SECTION A [150 MARKS]

I. There are 150 multiple choice questions in this Section

II. You must answer ALL the questions

III. There is no negative marking for wrong answers, but 1 mark will be deducted for each unanswered question

IV. Select the ***ONE BEST ANSWER*** in each question by **ENCIRCLING** the letter that corresponds to the answer

---

1. 'Drug efficacy' refers to:
   A. Effectiveness of drug in life threatening conditions
   B. The dose of the drug needed to produce half maximal effect
   C. The minimum dose of the drug needed to produce the toxic effect
   D. The maximal intensity of response that can be produced by the drug

2. The following statement is not true of log-dose response curve:
   A. It is almost linear except at the ends
   B. It facilitates comparison of different agonists
   C. It is a rectangular hyperbola
   D. It can help in discriminating between competitive and non-competitive antagonists

3. The therapeutic index of a drug is a measure of its:
   A. Safety
   B. Potency
   C. Efficacy
   D. Dose variability

4. If the dose-response curves of a drug for producing different actions are widely separated on the dose axis, the drug is:
   A. Highly potent
   B. Highly selective
   C. Highly efficacious
   D. Highly Toxic

5. Drugs acting through receptors exhibit the following features except:
   A. Dependence of action on lipid solubility
   B. Structural specificity
   C. High potency
   D. Competitive antagonism

6. Receptors perform the following function/functions:
   A. Ligand recognition
   B. Both ligand recognition and signal transduction
   C. Signal transduction
   D. Disposal of agonists and antagonists

7. A partial agonist has
   A. High affinity but no intrinsic activity
   B. Low affinity but high intrinsic activity
   C. High affinity but low intrinsic activity
   D. Low affinity and low intrinsic activity

8. Fastest acting receptor/transduction mechanism is:
   A. Adenylyl cyclase- cyclic AMP pathway
   B. Phospholipase C-IP3; DAG pathway
   C. Nuclear receptors
   D. Intrinsic ion channel operation

9. Which of the following does not act as a second messenger;
   A. G-Proteins
   B. Cyclic AMP
   C. Inositol tri-phosphate
   D. Diacylglycerol

10. Which of the following is always true?
   A. A more potent drug is more efficacious
   B. A more potent drug is safer
   C. A more potent drug is clinically superior
   D. A more potent drug can produce the same response at lower doses

11. A 400mg dose of a drug was administered and 200mg of it was eliminated after two hours. Which of the following is the amount of drug left after six hours if the drug follows first-order kinetics?
   A. 50mg
   B. 100mg
   C. 150mg
   D. 25mg

12. Which of the following affects drug distribution into tissues depends most?
   A. Interaction with other drugs
   B. Binding to plasma protein
   C. Rate of absorption
   D. Tissue receptors

B. Activation of adenosine triphosphate–sensitive potassium channels in target cells
C. Phosphorylation of a tyrosine kinase–linked receptor
D. Stimulation of hormone-sensitive lipase

31. A 54-year-old woman complained to her physician of an uncomfortable flushing for the past few days. Further exams led to the diagnosis of carcinoid syndrome due to primary carcinoid tumour of the lung, and the patient was scheduled for surgery. Which of the following drugs would be appropriate to control the patient's symptoms and to prevent a surgery-induced carcinoid crisis?
A. Somatropin
B. Leuprolide
C. Prolactin
D. Octreotide

32. A 61-year-old woman, suffering from severe osteoporosis, sustained a tibial fracture, and her physician decided to add teriparatide to the current therapy. Which of the following actions most likely mediated the therapeutic effect of teriparatide in this patient?
A. Inhibition of osteoclast activity
B. Inhibition of renal phosphate excretion
C. Inhibition of renal synthesis of calcitriol
D. Stimulation of osteoblast activity

33. A 78-year-old man was brought to the emergency room exhibiting bizarre behavior and paranoid ideation. He complained of headache, mental confusion, weakness, dizziness, and blurred vision. The man was suffering from type 2 diabetes, which was being treated with an oral anti-diabetic drug. On admission his blood glucose was 2.4 mmol/L (normal 3.5–6.5 mmol/L). Which of the following drugs most likely caused the patient's signs and symptoms?
A. Glibenclamide
B. Metformin
C. Pioglitazone
D. Acarbose

34. A 64-year-old woman was admit ted to the emergency department with the admit ting diagnosis of myxedema coma. An emergency treatment was started that included an intravenous inject ion of tri-iodothyronine (T3) every 6 hours for2 days. Which of the following were most likely the patient's serum levels of free thyroxine (FT4) and thyroid-stimulating hormone (TSH, thyrotropin) after 2 days of therapy?
A. FT4 low, TSH high
B. FT4 low, TSH low
C. FT4 high, TSH low
D. FT4 high, TSH high

143. A 52-year-old woman was discharged from the hospital after recovery from an acute myocardial infarction (MI). Her post-discharge medications included captopril. Which of the following actions most likely contributes to mortality reduction obtained by the use of angiotensin-converting enzyme inhibitors in MI?

A. Increased preload
B. Coronary vasodilation
C. Decreased ventricular automaticity
D. Reduction in cardiac modelling

144. A 58-year-old man presented to a clinic with the chief complaint of increasing shortness of breath and a 4 kg weight gain over the past 2 weeks. Physical examination revealed a dyspneic and cyanotic male with the following vital signs: blood pressure 135/100 mm Hg, pulse 125 bpm, respirations 22/min. His liver was enlarged, and pitting edema was seen on the legs. A Doppler echocardiogram showed an ejection fraction of 35%. An appropriate drug therapy was started that included metoprolol. Which of the following actions most likely contribute to the therapeutic effect of metoprolol in this patient?

A. Increased renin secretion
B. Prevention of chronic sympathetic over-activity
C. Decreased preload
D. Increased down-regulation of cardiac β adrenergic receptors

145. A 65-year-old man was admitted to the emergency department because of restlessness, apprehension, tremor, sweating, and tachycardia. Vital signs on admission were blood pressure 190/100 mm Hg, pulse 110 bpm, respirations 18/min. History revealed that the patient had been taking a thiazide diuretic and losartan for 3 months for stage 2 hypertension. However, his blood pressure was still not well controlled, and recently his physician had added a third drug to the therapeutic regimen. Because the patient was experiencing daytime somnolence and dry mouth, he decided to discontinue the newly prescribed medication the day before admission. Which of the following drugs was most likely the new drug that the patient decided to stop taking?

A. Captopril
B. Clonidine
C. Minoxidil
D. Hydralazine

146. A 51-year-old woman at a routine office visit was found to have a heart rate of 110 bpm. The woman had a history of atrial flutter for which she had been receiving quinidine for the past 2 weeks following a successful electrical cardioversion. The physician thought that her tachycardia was caused by quinidine. Which of the following actions best explains the mechanism of this adverse effect of quinidine?

A. Blockade of muscarinic receptors
B. Stimulation of arterial baroreceptors
C. Activation of calcium channels
D. Activation of potassium channels

UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

UNIVERSITY EXAMINATION

NOVEMBER/DECEMBER 2020

PGY 4210 (PHARMACOLOGY AND THERAPEUTICS)

COMPUTER NUMBER: .....

.....

INSTRUCTIONS

There are TWO sections in this examination paper: Section A and Section B

You must answer ALL the questions in both sections

TOTAL MARKS: 180

TIME: THREE (3) HOURS