The South African Pharmacy Council

PROFESSIONAL EXAMINATION OF COUNCIL IN TERMS OF THE PHARMACY ACT, 1974 (ACT 53 OF 1974)

APPLIED PHARMACOLOGY AND TOXICOLOGY EXAMINATION

2020 PRACTICE PAPER

TIME ALLOWED:	Three (3) hours
MAXIMUM MARKS:	90
PASS MARK:	45

APPLIED PHARMACOLOGY AND TOXICOLOGY

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NO. OF PAGES:	**18**

CANDIDATES PLEASE NOTE:

(a) Ensure that you have the correct question paper for your examination.
(b) Ensure that all your details as requested on the cover page are filled in correctly.
(c) There is 15 minutes reading time for this paper.
(d) Do not commence writing until you are told to do so.
(e) The marks allocated to each question must be borne in mind when answering
(f) All multiple choice questions are worth one mark.
(g) There is no negative marking for incorrect answers.
(h) There is only one correct answer per multiple choice question, therefore select only one option per question.
(i) All questions must be answered.

Surname: ----------

First names: ----------

P Number: ----------

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Date: ----------

Question	Marks awarded		Final Mark
	Examiner	Moderator	
Total			
Examiner signature		Moderator signature	

1. Which of the following statements applies to Phase I metabolic reactions?

   (a) They increase the hydrophilicity of a drug
   (b) They serve to improve the biliary excretion of a drug
   (c) They block functional groups on drugs
   (d) They include addition of a glucuronic group on a drug

2. Which of the following statements is TRUE about a drug that undergoes extensive first pass effect such as atorvastatin?

   (a) It will have a rapid onset of action in therapy
   (b) It distributes largely to adipose tissue
   (c) It reaches systemic circulation fairly rapidly
   (d) It requires administration of a higher oral dose for therapeutic efficacy

3. Administration of Drug D at twice the effective dose results in serious adverse effects and fatality. This phenomenon is BEST described by which of the following:

   (a) Drug D has a long half-life
   (b) Drug D has a low (narrow) therapeutic index
   (c) Drug D has high affinity for receptors
   (d) Drug D has high intrinsic activity

4. Prednisone is administered orally as a prodrug in its therapeutic use. Which of the following BEST describes the pharmacokinetics of prednisone?

   (a) Prednisone will be biotransformed into toxic metabolites
   (b) Prednisone absorption will be delayed if taken with food
   (c) Prednisone will be converted into an active metabolite in the body
   (d) Prednisone is rapidly destroyed in gastric acid

5. Increasing the pH of urine enhances the renal excretion of which of the following?
   (a) protein-bound drugs
   (b) acidic drugs
   (c) basic drugs
   (d) free drugs

6. Paracetamol is the analgesic of choice in various patient populations. Which of the following explains why it is preferred over other NSAIDs?

   (a) It has no antiplatelet effects
   (b) It does not affect hepatic function at high doses
   (c) It has high anti-inflammatory activity
   (d) It has less risk of ototoxicity

7. Paracetamol undergoes phase II metabolic reactions for elimination. Which of the following is TRUE about its pharmacokinetics?

   (a) It is preferentially excreted by biliary route at normal therapeutic doses
   (b) It is excreted renally as a glucuronide metabolite
   (c) Its oral and intramuscular bioavailability is the same

(d) It is hydrolysed by hepatic enzymes to increase its hydrophilicity

8. Prolonged use of high doses of paracetamol results in toxicity, that manifests by which of the following mechanisms?

(a) Hypernatraemia
(b) Hyperkalaemia
(c) Intravascular coagulation
(d) Depletion of glutathione stores

9. Aspirin is contraindicated as an analgesic in paediatrics mainly due to which of the following?

(a) It may cause anaphylactic shock
(b) It causes peptic ulceration and bleeding
(c) It is associated with Reye's syndrome
(d) It competes with other drugs for excretion

10. Which of the following BEST describes why a patient with gout should avoid using low dose aspirin?

(a) At low doses aspirin antagonises uric acid excretion
(b) At low doses aspirin binds to uric acid and forms a non-absorbable complex
(c) Aspirin lowers glomerular filtration at low doses
(d) Aspirin enhances enterohepatic recycling of uric acid

11. An acute gout attack is BEST managed by administration of the following:

(a) Allopurinol
(b) Ibuprofen
(c) Probenecid
(d) Prednisone

12. A patient with chronic gout should avoid or reduce intake of which of the following foods?

(a) Carbohydrate rich foods
(b) Green leafy vegetables
(c) High fibre foods
(d) Red meat and wine

Ms Q who has been battling obesity for a few years, has been diagnosed with Diabetes Mellitus Type 2 (DMT2). She has been prescribed metformin and was advised to increase daily exercise, stop alcohol intake and change to a healthy diet.

Answer the following questions 13-17 regarding DMT2 or metformin.

13. In DMT2 primarily characterised by insulin resistance, which of the following drug classes would provide the most benefits in managing the disease?
(a) Sulphonylureas to enhance insulin excretion by kidneys

(b) Thiazolidinediones to increase insulin sensitivity in adipose tissue
(c) α-glucosidase inhibitors to stimulate and insulin release and action in target tissue
(d) The glinides to lower the release of insulin from pancreatic beta cells

14. Metformin exerts a hypoglycaemic effect by which of the following mechanisms?

(a) Promotes uptake and utilization of glucose in the body
(b) Stimulates release of endogenous insulin from the pancreas
(c) Reduces cellular insulin resistance
(d) Inhibits the enzyme glucoamylase

15. The additional beneficial effects of metformin therapy for Ms Q is which of the following?

(a) Metformin does not have common gastrointestinal disturbances
(b) There is no risk of lactic acidosis with metformin
(c) Metformin induces mild anorexia and assists with weight loss
(d) Long term treatment with metformin enhances vitamin B12 absorption

16. MS Q was advised to avoid alcohol during therapy with metformin. This is due to which of the following reasons?

(a) A disulfiram reaction will occur if alcohol is taken
(b) The liver metabolism of metformin will be increased
(c) There is increased risk of lactic acidosis if taken with metformin
(d) The risk of hyperuricaemia is increased

17. Which of the following pharmacokinetic properties of metformin is CORRECT?

(a) Metformin is highly protein bound
(b) Metformin is poorly absorbed orally
(c) Metformin is excreted chiefly via the biliary system
(d) Metformin is not metabolised by the liver

Ms K, a 30-year-old female patient was diagnosed with pelvic inflammatory disease (PID) and was prescribed doxycycline oral 100 mg 12 hourly; ceftriaxone IM 250 mg single dose and metronidazole oral 400 mg 12 hourly for 10 days.

Answer question 18-26 with regards to this patient.

18. Which of the following describes the mechanism of action of metronidazole?
(a) Causes misreading of the genetic code in bacterial DNA synthesis
(b) Is a bacterial cell wall inhibitor
(c) Causes formation of free radicals in bacterial cells
(d) Inhibits peptidoglycan linkage of bacteria

19. The common adverse effects of metronidazole includes which of the following?

(a) Metallic taste
(b) Increased appetite
(c) Constipation

(d) Sedation

20. Which of the following statements is TRUE regarding metronidazole?

(a) It is contraindicated for antibiotic associated colitis
(b) Breastfeeding during therapy is recommended as it is not secreted in milk
(c) It is the medicine of choice to alleviate candidal overgrowth
(d) Patients should avoid alcohol during therapy and for 48 hours after discontinuation

21. Ceftriaxone may be classified as which of the following?

(a) Narrow spectrum β-lactam antimicrobial
(b) Bactericidal macrolide antimicrobial
(c) Bacteriostatic β-lactamase antimicrobial
(d) Broad spectrum β-lactam antimicrobial

22. Pharmacokinetics of ceftriaxone include which of the following?

(a) Absorption is significantly reduced by food
(b) Penetration and distribution into CSF is high
(c) Undergoes extensive first pass effect
(d) Excretion occurs via renal tubular secretion

23. The rationale for the use of ceftriaxone in PID treatment involves coverage for which of the following organisms?

(a) *Pseudomonas aeruginosa*
(b) *Neisseria gonorrhoeae*
(c) Anaerobic bacteria
(d) *Candida albicans*

24. Pseudomembranous colitis, which may occur as an adverse effect of ceftriaxone use, should be treated using which of the following?

(a) Probiotics
(b) Intravenous vancomycin
(c) Metronidazole
(d) High fibre diet

25. Drug interactions require necessary precautions from both the prescriber and the patient. Which of the following interactions are TRUE for ceftriaxone?

(a) Increased renal tubular secretion with probenecid
(b) Loss of efficacy of oral contraceptives
(c) Prolonged serum concentration with kanamycin
(d) Reduced absorption of calcium supplements

26. Some of the precautions that Ms K must take while on treatment include which of the following?

(a) Take doxycycline with lots of water while in an upright position

(b) Iron supplements will enhance the effects of doxycycline
(c) Avoid antacids as they decrease the absorption of doxycycline
(d) Increase intake of milk as calcium enhances the absorption of ceftriaxone

27. Which of the following medicines is teratogenic?

(a) Trimethoprim
(b) Flucloxacillin
(c) Amikacin
(d) Warfarin

28. Which of the following statements is TRUE with regards to the nephrotoxicity of drugs?

(a) Non-steroidal anti-inflammatory drugs (NSAIDS) cause irreversible renal failure in patients
(b) Angiotensin converting enzyme (ACE) inhibitors increase the glomerular filtration rate
(c) Sulphonamides lead to the formation of crystals in renal tubules
(d) Doxycycline causes interstitial nephritis

Mr VT was diagnosed with ventricular tachycardia and treatment was initiated with amiodarone IV, 5 mg/kg over 30 minutes, followed up with oral amiodarone 800 mg daily for seven days. Long term therapy was continued with 200 mg on alternate days.

Answer the following questions 29-32 regarding amiodarone:

29. Which of the following BEST describes the rationale for the IV administration of amiodarone?

(a) Therapeutic response from an oral dose may take up to three weeks to occur
(b) The IV administration avoids the adverse effects of the medicine
(c) Amiodarone undergoes extensive first pass effect
(d) IV administration avoids rapid renal excretion of amiodarone

30. The antiarrhythmic effect of amiodarone is exerted via which of the following receptor mechanisms?

(a) It blocks potassium, calcium and sodium channels and β-adrenoceptors
(b) It activates β-adrenoceptors and blocks sodium channels
(c) It inhibits all adrenergic receptors as well as some histamine receptors
(d) It blocks β-adrenoceptors and activates M1 and M2 muscarinic receptors

31. During the amiodarone therapy, Mr VT complained of tiredness, constipation and loss of appetite. These adverse effects are as a result of which of the following?

(a) Amiodarone directly activates B adrenergic receptors
(b) Amiodarone is structurally related to thyroid hormones
(c) Amiodarone is converted into an active metabolite by liver enzymes
(d) The target site of action of amiodarone is cells of thyroid gland

32. Precautions during therapy with amiodarone includes which of the following?

(a) If on simvastatin, the dose of simvastatin should be increased
(b) Adverse effects appear rapidly with IV administration
(c) Grapefruit juice lowers plasma levels of amiodarone and antagonize its effects
(d) Drug interactions and adverse effects may continue for months after withdrawal of amiodarone

On a long overnight flight from Osaka, Mr Y started experiencing pain in his lower right leg and was diagnosed with venous thrombo-embolism on arrival. He was immediately prescribed enoxaparin, subcutaneously, 1 mg/kg 12 hourly and warfarin 5 mg, oral daily. Enoxaparin therapy was stopped on day 5 and warfarin continued daily.

Answer the following questions 33 - 40 regarding the treatment.

33. Enoxaparin is a low molecular weight heparin and is preferred over unfractionated heparin for anticoagulation therapy. The advantage of enoxaparin over unfractionated heparin is which of the following?

(a) The anticoagulant response to enoxaparin is more predictable hence there is no need for monitoring
(b) The activated partial thromboplastin time (aPTT) test can be easily performed by the patient at a convenient time
(c) Unfractionated heparin induces allergic reactions in patients
(d) Enoxaparin can be administered orally in emergencies

34. The anticoagulant effects of enoxaparin are exerted through which of the following mechanisms of action?

(a) Inhibiting the synthesis of active clotting factors II, VII, IX and X by blocking their carboxylation
(b) Enhancing the fibrinolytic effect of plasminogen
(c) Inhibiting the action of thromboxane A2 and prostacyclin PG-I_2
(d) Potentiating antithrombin to form a complex that irreversibly inactivates clotting factor Xa

35. Which of the following BEST describes the reason for the 5 day overlap of the two medicines?

(a) The immediate synergistic anticoagulant effects between the two medicines
(b) Warfarin is less toxic when used with enoxaparin
(c) Enoxaparin effects peak in 3-5 hours while warfarin effects develop over 3-4 days
(d) Enoxaparin has permissive effect on warfarin

36. Which of the following tests should be carried out for Mr Y while on therapy with warfarin?

(a) International normalised ratio
(b) Activated Partial thromboplastin time
(c) Plasma warfarin levels
(d) Full Platelet Count

37. Warfarin interacts with many drugs and therefore there is a need for caution about all potential complications that may arise due to drug-drug interactions. NSAIDs such as aspirin should be avoided due to which of the following effects?

(a) The anticoagulant effect may be increased due to displacement of warfarin from protein binding sites
(b) Aspirin increases the clearance of warfarin thereby reducing its anticoagulant effect
(c) Aspirin increases gastric pH, which reduces the absorption and the anticoagulant effect of warfarin
(d) Warfarin and aspirin form a complex which is easily renally excreted hence no anticoagulant effect

38. Which of the following information is important for Mr Y to know while on therapy?

(a) Take warfarin during only at night as it causes dizziness and sedation
(b) Taking an alcoholic beverage once a day will have no effect on the treatment
(c) Inform the doctor if she is planning pregnancy or if it occurs, as warfarin is teratogenic
(d) Visit a clinic for regular eye tests as warfarin causes loss of vision

39. Which of the following adverse effects of warfarin would require immediate cessation of warfarin treatment and referral of the patient?

(a) Dizziness and nausea
(b) Purple-toe syndrome
(c) Arthralgia and headache
(d) Alopecia and urticaria

40. Which of the following would be indicated in case of excessive bleeding as a result of warfarin overdose?

(a) Protamine sulphate and fluid replacement
(b) Immediate intravenous vitamin k administration
(c) Intravenous electrolyte replacement and continuous monitoring
(d) Fresh frozen plasma and phytomenadione administration

A 48-year-old patient, Ms X, had been diagnosed with congestive heart failure (CHF) and had been put on furosemide 40 mg daily for a month. However she was recently hospitalised and has been discharged after being started on a regimen of oral digoxin, 0.125 mg daily.

Answer the following questions 41 - 51 regarding this treatment regimen.

41. Which of the following would be the symptoms that Ms X had experienced before diagnosis?

(a) Dyspnoea, headache, weight loss
(b) Fatigue, dyspnoea, tachycardia
(c) Bradycardia, fatigue, dizziness
(d) Coughing, weight loss, sweating

42. In view of the diagnosis, the rationale for the use of furosemide for Ms X would be which of the following?

(a) Ms X had significant fluid overload
(b) Ms X had abnormal pulmonary function
(c) Furosemide does not require electrolytes monitoring
(d) Furosemide has a relatively long duration of action of 10 hours

43. Ms X would be cautioned about the adverse effects of furosemide, which she must report to her doctor. Which of the following is the critical adverse effect that she must be aware of?

(a) Hallucinations
(b) Visual disturbance
(c) Numbness of fingers
(d) Hearing loss

44. The dose of digoxin, 0.125 mg is relatively low, however it is appropriate for Ms X. This is BEST explained by which of the following?

(a) Digoxin is highly potent and causes severe hepatic impairment
(b) Digoxin has a large volume of distribution as it accumulates in muscle
(c) Digoxin is highly potent and is not eliminated by the renal system
(d) Digoxin has a large volume of distribution as it accumulates in adipose tissue

45. Which of the following BEST describes the mechanism of action of digoxin?

(a) Blockage of calcium channels in myocardium
(b) Inhibition of the Na^+,K^+- ATPase in cardiac cells
(c) Blockage of β adrenoceptors in cardiac muscle
(d) Activation of α adrenoceptors in myocytes

46. Which of the following is the rationale for the use of digoxin in CCF?

(a) Digoxin causes coronary vasoconstriction and enhances cardiac output
(b) Digoxin increases venous return to the heart and improves circulation
(c) Digoxin increases stroke volume and cardiac output without increasing the heart rate
(d) Digoxin increases peripheral vasoconstriction and lowers cardiac resistance

47. During initiation as well as continued treatment with digoxin, which of the following should be conducted to ensure appropriate care?

(a) Hearing test
(b) Visual acuity test
(c) Therapeutic drug monitoring
(d) Allergen response test

48. Which of the following BEST explains the rationale for the specific tests required during digoxin therapy?

(a) Digoxin has a low therapeutic index
(b) Digoxin has a wide margin of safety
(c) Digoxin has a short half-life
(d) Digoxin is not protein bound

49. Ms X's doctor should be cautious and ensure that Ms X is not at risk of digoxin toxicity. Which of the following conditions should be excluded as it would predispose the patient to digoxin toxicity?

(a) Hypokalaemia
(b) Hyperuricaemia
(c) Excess body weight
(d) Hyperglycaemia

50. Drugs may interact with digoxin by protein binding site displacement or competition for renal excretion. Which of the following non-prescription medicines should Ms X be warned about, as it may cause elevated levels of digoxin?

(a) Laxatives
(b) Cholestyramine
(c) Aluminium antacid
(d) Aspirin

51. In case Ms X overdoses and suffers from digoxin toxicity, digoxin immune Fab should be administered. Which of the following is the mechanism of action of this antidote?

(a) Binds and inactivates digoxin
(b) Binds and prevents intestinal absorption of digoxin
(c) Binds and enhances faecal excretion of digoxin
(d) Competes with digoxin at the receptor

52. Which of the following β-blockers is cardioselective in its action?

(a) Propranolol
(b) Labetalol
(c) Atenolol
(d) Timolol

53. Which of the following BEST explains why carvedilol is recommended for the management of congestive heart failure?

(a) It is the most potent blocker of all alpha and beta adrenergic receptors
(b) It can be used in asthmatic patients
(c) It can be used in liver impairment as it is not does not have effects on cytochrome P450 enzymes
(d) It has antioxidant, anti-inflammatory and antiapoptopic effects which are all cardioprotective

Ms MD who is 34 weeks pregnant was diagnosed with moderate hypertension and put on methyldopa 250 mg bd. On her 1st week clinic visit, her blood pressure had stabilised but she complained of persistent drowsiness.

Answer the following questions 54 - 61 regarding this treatment regimen.

54. General physiological changes in pregnancy may affect the dose and dosing regimens of many drugs. Which of the following is the CORRECT observation which could influence therapeutic outcomes in pregnancy?

(a) Increased renal excretion reduces the elimination of drugs that are renally excreted
(b) Increased plasma volume causes reduced concentration of hydrophilic drugs
(c) Increased intestinal transit time causes reduced absorption of drugs
(d) Reduced plasma protein concentration reduces circulating free drugs

55. Methyldopa is BEST suited for the treatment of hypertension in pregnancy due to which of the following?

(a) It acts centrally and leads to a decrease in total peripheral resistance
(b) It is a β-receptor agonist which causes vasodilation and low plasma volume
(c) It lowers vagal nerve activity and increases sympathetic system tone
(d) It decreases cardiac output and the heart rate

56. If Ms MD could not tolerate methyldopa, which of the following medicines would be safe to use for her treatment?

(a) Hydrochlorothiazide as it does not cross the placenta
(b) Furosemide as it is not teratogenic
(c) Hydralazine as it is an arteriolar vasodilator
(d) Enalapril as it blocks ion channels in the periphery only

57. With regard to the drowsiness she is complaining about, which of the following would be the BEST approach to address it?

(a) It is a common side effect of methyldopa which can be reduced by taking the medicine as a single evening dose
(b) It is caused by increased plasma volume and should be alleviated by taking half the recommended dose daily
(c) It occurs as a result of reduced plasma protein and should be lessened by increasing the dose accordingly
(d) It may be due to hormonal imbalance and will require concomitant intake of oestrogen supplements

58. As a pharmacist, you know Ms MD should be warned to avoid any self-medication, and should ask the doctor first about any medicine she wants to use during pregnancy. Which of the following medicines should be avoided by Ms MD as it may cause prolonged labour?

(a) Salbutamol
(b) Ibuprofen
(c) Amoxicillin
(d) Vitamin a

59. Ms MD informed the doctor that she has had strong craving for substances such as soil, charcoal and ice. Which of the following supplements would the doctor recommend to counteract this situation?

(a) Thiamine supplements

(b) Vitamin B12 supplements
(c) Folic acid supplements
(d) Ferrous sulphate supplements

60. Which of the following medicines would be recommended for Ms MD for the prevention of spina bifida in the foetus?

(a) Vitamin B12 and Folic acid
(b) Vitamin B12 and Zinc
(c) Vitamin A and Iron
(d) Vitamin D and selenium

61. If Ms MD was planning to travel to a malaria-endemic area, which of the following drugs would be indicated for prophylaxis?

(a) Doxycycline
(b) Mefloquine
(c) Artemether-lumefantrine
(d) Atovaquone–proguanil

A 47-year-old male truck driver has just been diagnosed with tuberculosis (TB) following a Gene XPERT test. He has been provided with his first line anti-TB medication as well as information about the condition and clear instructions of when and how long he should take the medicines. His medicine pack also includes pyridoxine tablets to be taken for the same period.

Answer the following questions 62 - 70 regarding this treatment regimen

62. Which of the following is the role of pyridoxine in the treatment?

(a) To synergistically increase the anti-tuberculosis effect
(b) To improve on the bioavailability of rifampicin
(c) To prevent peripheral neuropathy caused by isoniazid
(d) To allow reduced doses of the anti-tb medicines

63. Which of the following describes the advantage of using the Gene XPert test as opposed to the traditional tests for diagnosis of TB?

(a) The test indicates the presence of the mycobacterium and the hepatic status of the patient
(b) The test confirms the presence of the mycobacterium and indicates the sensitivity of the organisms to rifampicin
(c) It is a rapid test which also indicates how long the patient has been infected
(d) The test indicates the presence of the mycobacterium and the appropriate dose for the patient

64. The use of combination treatment for TB is intended to prevent development of resistance as each of the medicines has a unique mechanism of action. Which of the following is the CORRECT mechanism of action of rifampicin?

(a) Prevents mycolic acid synthesis causing loss of acid-fastness
(b) Inhibits bacterial DNA-dependent RNA polymerase thereby preventing RNA synthesis
(c) Inhibits growth of organism by lowering intracellular pH
(d) Inhibits arabinosyl transferase which is important for cell wall synthesis

65. Which of the medicines may be used as monotherapy for prophylaxis of TB in specific cases such as in children?

(a) Isoniazid
(b) Rifampicin
(c) Streptomycin
(d) Pyrazinamide

66. The combination therapy may result in several adverse effects, some of which could need the patient to be referred or treatment to be stopped. Which of the following is an adverse effect that may be produced by rifampicin, isoniazid and pyrazinamide?

(a) Anaemia
(b) Anorexia
(c) Hepatitis
(d) Headache

67. Which of the following anti-TB medicines would be cause for concern if the patient was prone to gout attacks?

(a) Isoniazid and rifampicin
(b) Ethambutol and pyrazinamide
(c) All four first line drugs
(d) Rifampicin and ethambutol

68. Which of the following medicines could negatively affect his ability to perform his job safely as a truck driver?

(a) Pyridoxine due to its palatability
(b) Rifampicin as it slows reflexes
(c) Pyrazinamide as it causes loss of hearing
(d) Ethambutol as it causes loss of red-green visual acuity

69. Drug interactions that may occur with the anti–TB treatment are due to which of the following mechanisms?

(a) Rifampicin and isoniazid are hepatic enzyme inducers
(b) Pyrazinamide is a hepatic enzyme inhibitor
(c) Rifampicin is a hepatic enzyme inducer
(d) Ethambutol is a hepatic enzyme inhibitor

70. If the patient was diagnosed with Multidrug resistant TB (MDR-TB), it would mean that the organisms have developed resistance to which of the following medicines?

(a) Ethambutol and isoniazid

(b) Isoniazid and rifampicin
(c) Pyrazinamide and rifampicin
(d) Isoniazid and pyridoxine

71. The standard treatment regimen for MDR-TB comprises minimum 24 months of therapy with a combination of which of the following medicines?

(a) Isoniazid, ethionamide, pyrazinamide and rifamycin
(b) Kanamycin, ethionamide, pyrazinamide and moxifloxacin
(c) Pyrazinamide, clavulanic acid, streptomycin and pyridoxine
(d) Amikacin, ethambutol, isoniazid and streptomycin

Mr SP was admitted to the emergency room, after an acute asthma attack. He was immediately placed on a regimen of Ipratropium bromide / fenoterol nebulising solution 1:1 via space mask 1 hourly.

Answer the following questions 72 - 77 regarding this treatment regimen

72. Fenoterol is of the first line agents for treatment of acute asthma. Which of the following is its appropriate classification?

(a) M_3 muscarinic receptor agonist
(b) β_2 receptor agonist
(c) β_2 receptor antagonist
(d) α_1 receptor agonist

73. Which of the following is the rationale for the use of both drugs in Mr SP's treatment?

(a) They both result in bronchodilation via different receptor mechanisms
(b) Fenoterol is a bronchodilator and ipratropium bromide blocks histamine release
(c) Both medicines are rapid acting cholinergic antagonists
(d) Fenoterol is sympatholytic whereas ipratropium bromide is parasympatholytic

74. Which of the following is an adverse effect of ipratropium bromide that the patient could experience?

(a) Urinary incontinence
(b) Diarrhoea
(c) Dry mouth
(d) Teary eyes

75. Which of the following medicines could be added to the regimen for additional anti-asthmatic effect?

(a) Salbutamol
(b) Aspirin
(c) Carvedilol
(d) Prednisone

76. Which of the following asthma medications exerts its activity by blocking the leukotriene receptors and reducing the accumulation of mucus in the lungs?

(a) Zileuton
(b) Theophylline
(c) Montelukast
(d) Omalizumab

77. Which of the following describes the key role of corticosteroids in the short-term management of asthma?

(a) Suppression of the inflammatory response
(b) Immediate additive bronchodilator effect
(c) Rapid histamine receptor blockage
(d) Reduction of viscosity of airway mucus

78. The standard antiretroviral therapy recommended for newly diagnosed adult HIV infected patients includes tenofovir and which of the following medicines?

(a) Lopinavir and emtricitabine
(b) Abacavir and nevirapine
(c) Lamivudine and dolutegravir
(d) Zidovudine and stavudine

79. Which of the following antiretroviral drugs is associated with lipoatrophy?

(a) Tenofovir
(b) Efavirenz
(c) Stavudine
(d) Emtricitabine

80. Protease inhibitors are included in the combination ART due to which of the following effects?

(a) They prevent transcription of viral RNA
(b) They result in the formation of non-infective viral particles
(c) They prevent the entry of viral particles into host cells
(d) They prevent integration of viral RNA into host DNA

81. The preferred antiretroviral regimen when a patient is on rifampicin-based anti-tuberculosis therapy is:

(a) Tenofovir, efavirenz and lamivudine
(b) Tenofovir, abacavir and zidovudine
(c) Nevirapine, abacavir, ritonavir
(d) Saquinavir, nevirapine and stavudine

82. Which of the following BEST explains the role of ritonavir in the fixed dose lopinavir/ritonavir combination?

(a) To prevent development of resistance to lopinavir

(b) To primarily provide additive antiretroviral effect
(c) To increase the bioavailability of lopinavir
(d) To allow slow release of lopinavir

83. Carbamazepine is correctly indicated in epilepsy for which of the following?

(a) Status epilepticus
(b) Febrile seizures
(c) Absence seizures
(d) Partial seizures

84. Which of the following should be taken into consideration when prescribing carbamazepine?

(a) It is rapidly absorbed when administered orally
(b) It is an inhibitor of hepatic microsomal enzymes
(c) It induces its own hepatic metabolism
(d) It is converted to an inactive epoxide metabolite

85. Carbamazepine is also correctly indicated for which of the following conditions?

(a) Trigeminal neuralgia
(b) Migraine
(c) Schizophrenia
(d) Bell's palsy

86. Activated charcoal (AC) is the antidote for a wide range of toxic substances, either as single or multiple doses. Which of the following describes its antidote mechanism?

(a) enhances the renal clearance of the absorbed toxins
(b) binds toxins and prevents their systemic absorption from the GIT
(c) enhances the enterohepatic circulation of the toxin for hepatic elimination
(d) binds the free toxin in plasma and prevents its binding on receptors

87. Activated charcoal is indicated in which of the following?

(a) Cocaine poisoning
(b) Theophylline poisoning
(c) Iron overdose
(d) Methanol poisoning

88. Which of the following agents is a chelator used for the treatment of heavy metal poisoning?

(a) Acetylcysteine
(b) Dimercaprol
(c) Penicillin
(d) Transcobalamin

89. Overdose with β-blockers such as propranolol is treated with the administration of which of the following antidotes?

(a) Atropine
(b) Naltrexone
(c) Glucagon
(d) Cholestyramine

90. Which of the following medicines is matched with the CORRECT antidote?

(a) Paracetamol – protamine sulphate
(b) Aspirin – fresh frozen plasma
(c) Iron – ascorbic acid
(d) Methanol –ethanol