

CANDIDATE'S REG. NUMBER _____

SPECIAL SUPP EXAM MBChB YR 3 2016



**MASENO UNIVERSITY
SCHOOL OF MEDICINE
MBChB PROGRAM
THIRD YEAR 2015/2016**

**CLINICAL PHARMACOLOGY 1
(MCS 300)
SUPPLEMENTARY EXAM**

CLINICAL PHARMACOLOGY 1

(3 HOURS)

DATE: 20TH DECEMBER, 2016

TIME: 9.00 A.M. – 12.00 NOON

GENERAL INSTRUCTIONS

1. Write your University Registration Number on every piece of paper you use.
2. Do not write your name on any piece of paper you use.
3. The questions are set out in **THREE (3)** sections headed Section A: MCQs,
Section B: SAQs and Section C : MEQ (110 Marks)
4. **SECTION A** has **SIXTY (60)** Multiple Choice Questions (MCQs).
(60 Marks)
5. **SECTION B** has six (6) Short Answer Questions (SAQs). (30 Marks)
6. **SECTION C** has **ONE (1)** Modified Essay Question (MEQ). (20 Marks)
7. **Answer MCQs only in this PAPER. SAQs and MEQ are to be answered in the BOOKLETS provided.**
8. Read carefully the additional instructions preceding each section.

ATTEMP ALL QUESTIONS

SECTION A (MCQs) – 60 QUESTIONS (CIRCLE THE CORRECT ANSWER)

1. Which set of electrolyte disorders would predispose to arrhythmias following the administration of digoxin to a patient with heart failure?
 - a. Hyponatraemia, hyperkalaemia and hypocalcaemia
 - b. Hyponatraemia, hypermagnesaemia and hyperkalaemia
 - c. Hypomagnesaemia, hyperkalaemia and hypocalcaemia
 - d. Hypermagnesaemia, hypokalaemia and hyponatraemia
 - e. Hypokalaemia, hypomagnesaemia and hypercalcaemia

2. An antiarrhythmic agent that exerts its effect by blocking the sodium ion channels is:
 - a. Amiodarone
 - b. Diltiazem
 - c. Atenolol
 - d. Flecainide
 - e. Adenosine

3. Which of the following antiarrhythmic drugs exhibits the LEAST potential for drug-drug interaction due to its simple pharmacokinetic profile?
 - a. Sotalol
 - b. Procainamide
 - c. Quinidine
 - d. Digoxin
 - e. Amiodarone

4. The following drug has minimal effect on myocardial contractility:
 - a. Felodipine
 - b. Nicardipine
 - c. Nimodipine
 - d. Nifedipine
 - e. Verapamil

5. Dobutamine is effective in the treatment of acute heart failure. By which of the following adrenergic receptors - mediated actions does dobutamine cause its effects?
 - a. α -adrenergic agonist
 - b. α -adrenergic antagonist
 - c. β_1 -adrenergic agonist
 - d. β_1 -adrenergic antagonist
 - e. Mixed α and β antagonist

6. The drug class with minimal role in the management of congestive heart failure is:
- Angiotensin converting enzyme inhibitors
 - Non-dihydropyridine calcium channel blockers
 - Mixed adrenergic receptor antagonists
 - Arterial vasodilators
 - Aldosterone antagonists
7. Niacin produces the following effects EXCEPT:
- Reduced hepatic VLDL synthesis
 - Decreased hormone-sensitive lipase activity
 - Increased plasma concentrations of apo A-I
 - Increased plasma concentration of tissue plasminogen activator
 - Increased plasma concentration of fibrinogen
8. Administration of gemfibrozil is associated with the following EXCEPT:
- Increased adipose tissue lipoprotein lipase
 - Increased clearance of triglyceride-rich lipoproteins
 - Increased fatty acid oxidation
 - Increased expression of apo-C-III
 - Increased expression of apo-A-I
9. Statins produce their effects by:
- Down regulation of LDL receptors
 - Decreasing clearance of LDL, VLDL and VLDL remnants from circulation
 - Reduction of triglyceride levels
 - Inhibition of lipoprotein lipase
 - Inhibiting HMGCoA reductase in cholesterol biosynthesis
10. Which of the following lipid lowering drugs causes rhabdomyolysis?
- Atorvastatin
 - Gemfibrozil
 - Cholestyramine
 - Ezetimibe
 - Niacin
11. The statement that correctly describes GABA receptors is:
- All are ionotropic receptors
 - GABA-A receptor is coupled to a G protein
 - Only GABA-B receptor is ionotropic
 - GABA-B receptor is mainly post synaptic

- e. GABA-A receptor is an ionotropic receptor
12. A 12-year-old boy is put on ethosuxamide for the management of his seizures, what is the mechanism by which this agent causes the antiseizure effect?
- It enhances the GABA transmission in the thalamus
 - It blocks the sodium ion channels in the cortex
 - It opens the potassium channels in the thalamus
 - It reduces the calcium ion currents in the thalamus
 - It inhibits glutamate effect in the cortex
13. The mechanism of action of vigabatrin when used in the management of partial seizures is:
- Sodium channel blockade
 - Increase in frequency of chloride channel opening
 - Calcium channel blockade
 - Increased potassium channel permeability
 - It inhibits the degradation of GABA
14. Which of the following statements correctly describes the mechanism of action of methylphenidate?
- It is a direct agonist at the adrenergic receptors in the brain
 - It releases the monoamines from the nerve terminals in the brain
 - It inhibits the D2 receptors in the brain
 - It binds to and stimulates the GABA receptors in the brain
 - It is a central muscarinic receptor antagonist
15. The correct description of the pharmacokinetic profile of phenytoin is:
- Its absorption does not depend of the formulation and dosage form
 - It has low plasma binding ability
 - Its elimination is dose dependent
 - Its metabolism is unsaturable
 - Plasma concentration does not rise significantly with increase in dosages
16. Although a patient was instructed not to drink alcohol because of a medication he was taking, he did not listen to advice and decided to have a drink of alcohol. Within minutes, he developed flushing, a throbbing headache, nausea and vomiting. The most likely medicine he was taking is:
- Disulfiram
 - Diazepam
 - Naloxone

- d. Phenobarbital
 - e. Tranylcypromine
17. Carbidopa is useful in the treatment of Parkinson's disease because it
- a. Is a precursor of levodopa
 - b. Is a dopaminergic receptor agonist
 - c. Prevents peripheral biotransformation of L-dopa
 - d. Prevents a breakdown of dopamine
 - e. Promotes a decreased concentration of L-dopa in the nigrostriatum
18. A dopamine receptor agonist that is useful in the therapy of Parkinson's disease is
- a. Selegiline
 - b. Bromocriptine
 - c. Amantidine
 - d. Belladonna
 - e. Benztropine
19. The correct description of selegiline is:
- a. At low doses it selectively causes irreversible inhibition of monoamine oxidase B enzyme
 - b. At low doses it is a nonselective inhibitor of monoamine oxidase enzyme
 - c. It is a reversible inhibitor of monoamine oxidase B enzyme at all dosages
 - d. The selectivity for monoamine oxidase B is only at high doses
 - e. It can safely be taken with l-dopa always
20. Haloperidol may best be characterized by which of the following statements?
- a. It is classified as a phenothiazine
 - b. It is a selective D2 receptor agonist
 - c. Its mechanism of action is completely different from that of chlorpromazine
 - d. It is more potent as an antipsychotic drug than is chlorpromazine
 - e. It produces a lower incidence of extrapyramidal reactions than does chlorpromazine
21. A patient is treated with an antipsychotic agent and develops muscle rigidity, altered mental status, unstable blood pressure and myoglobinuria thereafter. What could have occurred?
- a. Tardive dyskinesia
 - b. Neuroleptic malignant syndrome
 - c. Allergy to the medications
 - d. Drug overdose

- e. Developed Parkinson's disease
22. Which of the following is NOT associated with enhancement of the activity of gamma-aminobutyric acid (GABA)?
- Doxepin
 - Chlordiazepoxide
 - Phenobarbital
 - Diazepam
 - Valproic acid
23. At a follow-up visit one month after a 22-year-old male was newly diagnosed with schizophrenia and started on chlorpromazine, he has several complaints, listed below. Which of the following cannot be attributed to chlorpromazine?
- Restless feeling
 - Sexual dysfunction
 - Urinary hesitancy
 - Vomiting
 - Blurred vision
24. A 27-year-old male presents with reactive depression following the accidental death of a close relative. A tricyclic antidepressant is chosen to control his depression. Which adverse effect would NOT be of concern?
- Insomnia
 - Sedation
 - Dry mouth
 - Orthostatic hypotension
 - Tardive dyskinesia
25. A pediatric patient treated for grand mal seizures develops abnormal values on liver function tests. Which of the following antiepileptic agents would cause this to occur?
- Carbamazepine
 - Valproic acid
 - Phenytoin
 - Phenobarbital
 - Gabapentin
26. A patient being treated with an antidepressant agent decides to take a snack containing cheese and a glass of red wine. She soon develops headache, nausea, and palpitations. She goes to the casualty department where her blood pressure is found to be 200/110 mmHg. What antidepressant did she take?

- a. Sertraline
 - b. Phenelzine
 - c. Nortriptyline
 - d. Trazodone
 - e. Fluoxetine
27. A psychotic patient presents with depression, which antidepressant agent would be more preferable?
- a. Amitriptyline
 - b. Imipramine
 - c. Fluoxetine
 - d. Amoxapine
 - e. Haloperidol
28. Which antidepressant is associated with minimal effect on sexual function?
- a. Bupropion
 - b. Maprotiline
 - c. Mirtazapine
 - d. Tranylcypromine
 - e. Trazodone
29. The antidepressant agents that selectively inhibits serotonin reuptake with little effect on norepinephrine reuptake is:
- a. Clomipramine
 - b. Maprotiline
 - c. Phenelzine
 - d. Venlafaxine
 - e. Selegiline
30. A 10-year-old boy was diagnosed with acute lymphoblastic leukemia and put on a regimen containing methotrexate. His recent white blood cell count and platelet count is below normal. Which of the following agent should be administered to counter this toxicity?
- a. Menadione
 - b. Leucovorin
 - c. Penicillamine
 - d. Mesna
 - e. Dexferoxamine
31. Cardiotoxicity is a dose limiting adverse effect of:

- a. Bleomycin
 - b. Mitomycin C
 - c. Plicamycin
 - d. Doxorubicin
 - e. Cyclophosphamide
32. A 40-year-old man is found to have decreased pulmonary function on examination and a pre-existing pulmonary disease. The drug which is best avoided in this patient is:
- a. Vincristine
 - b. Daunorubicin
 - c. Bleomycin
 - d. Cisplatin
 - e. Busulphan
33. A 60-year-old male with chronic obstructive lung disease is given ipratropium bromide as part of his therapeutic regimen. What is the mechanism of action of ipratropium?
- a. Inhibition of airway muscarinic receptors
 - b. Inhibition of 5-lipoxygenase
 - c. Breakdown of mucus
 - d. Inhibition of mediator release
 - e. Activation of beta-adrenergic receptors
34. An effective antidiarrheal agent that inhibits peristaltic movement is:
- a. Clonidine
 - b. Bismuth subsalicylate
 - c. Oral electrolyte solution
 - d. Atropine
 - e. Diphenoxylate
35. The steatorrhea of pancreatic insufficiency can best be treated by:
- a. Cimetidine
 - b. Misoprostol
 - c. Bile salts
 - d. Pancrelipase
 - e. Secretin
36. Pain due to chronic pancreatitis can be managed with active delivery of pancreatic enzymes to the duodenum because:
- a. Activation of pancreatic enzyme release by the presence of duodenal enzymes through a positive feedback mechanism

- b. Inhibition of the cholecystokinin releasing monitor peptide in the duodenum
 - c. Enhancement of cholecystokinin activity in the duodenum
 - d. Inhibiting the release of somatostatin
 - e. Inhibition of duodenal motility
37. A drug of choice in the therapy of inflammatory bowel disease is:
- a. Sulfadiazine
 - b. Sulfasalazine
 - c. Sulfapyridine
 - d. Sulfamethoxazole
 - e. Salicylate sodium
38. An important drug in the therapy of portal systemic encephalopathy is:
- a. Lactulose
 - b. Lactate
 - c. Loperamide
 - d. Lorazepam
 - e. Loxapine
39. Which of the following vitamins is teratogenic in large doses?
- a. Vitamin A
 - b. Vitamin B12
 - c. Vitamin D
 - d. Vitamin C
 - e. Vitamin E
40. A drug that competitively blocks the binding of plasmin to fibrin to inhibit fibrinolysis is:
- a. Ticlopidine
 - b. Clopidogrel
 - c. Aminocaproic acid
 - d. Tirofiban
 - e. Dipyridamole
41. Which of the following is indicated in the management of kidney stones due to hypercalciuria?
- a. Furosemide
 - b. Ethacrynic acid
 - c. Spironolactone
 - d. Hydrochlorothiazide
 - e. Mannitol

42. A reduction in insulin release from the pancreas may be caused by which of the following diuretics?
- Triamterene
 - Chlorothiazide
 - Spironolactone
 - Acetazolamide
 - Mannitol
43. Which of the following is not associated with potassium wasting?
- Amiloride
 - Hydrochlorothiazide
 - Acetazolamide
 - Furosemide
 - Ethacrynic acid
44. A 78-year-old man has congestive heart failure and therefore has indication for diuretic therapy. He is however known to be hypersensitive to sulphur containing medicines. The most appropriate diuretic medicine option for this patient is:
- Ethacrynic acid
 - Furosemide
 - Acetazolamide
 - Metolazone
 - Chlorthalidone
45. The following are antiplatelet agents EXCEPT:
- Ticlopidine
 - Clopidogrel
 - Enoxaparin
 - Aspirin
 - Tirofiban
46. A 35-year-old female plans to travel from Kisumu to Mombasa. She however suffers from motion sickness whenever she travels. What would be the appropriate prophylactic agent for this patient?
- Haloperidol
 - Metoclopramide
 - Aprepitant
 - Promethazine
 - Ondansetron

47. Domperidone:

- a. Has histamine receptor antagonistic effect
- b. Has antiemetic effect because of its interaction with the D2 receptors in the nucleus of the solitary tract
- c. Is a D2 receptor antagonist which is effective in the management of motion sickness
- d. Has a similar adverse effects profile as that of metoclopramide because of similar pharmacokinetic profiles
- e. Does not readily cross the blood brain barrier but exhibits antiemetic effect

48. A long acting beta 2 adrenergic agonist:

- a. Albuterol
- b. Salmeterol
- c. Metaproterenol
- d. Terbutaline
- e. Pirbuterol

49. An antitussive drug with little analgesic and addictive potential is:

- a. Codeine
- b. Bromhexidine
- c. Ambroxol
- d. Dextromethorphan
- e. Guaifenesin

50. Which of the following drug is NOT active against luminal nematodes?

- a. Thiabendazole
- b. Albendazole
- c. Pyrantel pamoate
- d. Levamisole
- e. Paromomycin

51. Which of the following drugs is NOT a rapidly acting blood schizonticide?

- a. Mefloquine
- b. Primaquine
- c. Chloroquine
- d. Quinine
- e. Artesunate

52. Misoprostol has cytoprotective action on the gastro-intestinal mucosa because it:

- a. Neutralizes acid secretion
 - b. Relieves ulcer symptoms
 - c. Coats the gastro-intestinal mucosa
 - d. Antagonizes non-steroidal anti-inflammatory drugs' effect
 - e. Enhances secretion of mucus and bicarbonate ion
53. Parathyroid hormone has which one of the following effects?
- a. Increases mobilization of calcium ions from bones
 - b. Increases bone osteoblastic activity
 - c. Decreases renal tubular reabsorption of calcium ions
 - d. Decreases reabsorption of phosphate from bones
 - e. Reduces active absorption of calcium ions from the small intestines
54. Clonidine is a:
- a. Direct β -adrenergic receptor agonist that enhances vasodilatation
 - b. Direct α_2 -adrenergic receptor antagonist that decreases Norepinephrine (NE) release and sympathetic tone
 - c. Direct α_2 -adrenergic agonist that decreases NE release and sympathetic tone
 - d. Direct α_1 -adrenergic receptor antagonist that decreases vasoconstriction
 - e. Direct β_1 -adrenergic receptor antagonist that decreases cardiac output
55. Donepezil is used to enhance alertness in patients with dementia. It acts by enhancing the CNS activity of:
- a. Dopamine
 - b. Acetylcholine
 - c. Caffeine
 - d. Scopolamine
 - e. Serotonin
56. Which of the following is a sign of acetylcholine (ACh) agonism at its post synaptic muscarinic receptor?
- a. Urinary retention
 - b. Muscle fasciculations
 - c. Bradycardia
 - d. Tachycardia
 - e. Dry mucous membranes
57. What is the interaction that occurs when atorvastatin is combined with cholestyramine in the management of hyperlipidaemia?
- a. The combination will not lower cholesterol more than either agent alone

- b. The combination causes elevated very-low-density lipoprotein (VLDL)
 - c. Cholestyramine inhibits gastrointestinal (GI) absorption of artovastatin
 - d. Artovastatin is a direct antagonist of cholestyramine
 - e. The combination will be ineffective.
58. A patient is put on ezetimibe for the management of his hypercholesterolaemia. What is the mechanism by which this drug causes its action?
- a. Inhibits the synthesis of cholesterol by the liver
 - b. Inhibits reabsorption of cholesterol
 - c. Sequesters bile acid in the intestines
 - d. Enhances cholesterol excretion in feaces
 - e. Inhibits cholesterol absorption in the duodenum
59. Concern is raised in an 86-year-old male with type II diabetes, about the possibility of hypoglycemia when considering the use of an oral hypoglycemic agent. Which of the following antidiabetic drugs is LEAST likely to cause hypoglycemia?
- a. Glyburide
 - b. Tolbutamide
 - c. Metformin
 - d. Chlorpropamide
 - e. Insulin
60. The most dangerous adverse reaction to the administration of carbimazole is:
- a. Hypothyroidism
 - b. Arthralgia
 - c. Jaundice
 - d. Agranulocytosis
 - e. Renal toxicity

SECTION B – ATTEMPT ALL QUESTIONS IN THIS SECTION (30 Marks)
INSTRUCTIONS:-

- i. **THERE ARE SIX (6) QUESTIONS IN THIS SECTION.**
 - ii. **ANSWER ALL THE SIX (6) SAQs.**
 - iii. **START EACH QUESTION ON A FRESH SHEET OF PAPER IN THE BOOKLET PROVIDED.**
 - iv. **EACH QUESTION HAS BEEN ALLOCATED DIFFERENT MARKS AT THE END.**
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1. Briefly outline the differences in the mechanisms of actions of the following pairs of drugs (8 marks)
 - a. Heparin and warfarin
 - b. Amrinone and digoxin
 - c. Granisetron and promethazine
 - d. L dopa and methyldopa
 2. Explain the action of ethanol when used in the management of methanol poisoning (5 marks)
 3. Briefly describe the mechanism by which nitrates cause their effect in the management of ischaemic heart disease (5 marks)
 4. List any THREE (3) adverse effects that are specific to the use of angiotensin converting enzyme inhibitors (3 Marks)
 5. Give any FIVE(5) examples of oral antidiabetic drugs and for each class give ONE(1) drug example (5 marks)
 6. Explain the reason for tapering of glucocorticoid doses after prolonged administration (4 marks)

SECTION C- MODIFIED ESSAY QUESTION (20 Marks)

INSTRUCTIONS:-

- **THERE IS ONE (1) QUESTION CONSISTING OF A STEM PARAGRAPH AND QUESTIONS NOs. (a) to (e) IN THIS SECTION.**
- **ANSWER ALL QUESTIONS ON THE BOOKLET PROVIDED.**
- **EACH QUESTION HAS BEEN ALLOCATED DIFFERENT MARKS AT THE END.**

1. M.N is a 45-year-old female patient who presents to the emergency department with signs and symptoms of peptic ulcer disease. She is a known diabetic type 1 patient who also developed symptoms of congestive heart failure and renal insufficiency a year ago. Her current medication include: carvedilol 6.25mg once daily, Enalapril 10mg once daily and furosemide 40mg daily
 - a. Classify drugs that would be effective in the management of the patient's peptic ulcer disease and give ONE (1) example of each class (5 marks)
 - b. List any THREE insulin preparations that would be appropriate for the management of type 1 diabetes mellitus (3 marks)
 - c. Give any THREE (3) potential adverse effect of insulin therapy (3 marks)
 - d. Briefly explain the actions of these drugs and the reason for their beneficial effects when used in the management of congestive heart failure (6 marks)
 - i. Carvedilol
 - ii. Enalapril
 - iii. Furosemide
 - e. If digoxin is later added to the patient's therapy, list any THREE (3) potential drug- drug interactions with the patient's medications (3 marks)