SIMON MAZORODZE SCHOOL OF MEDICAL AND HEALTH SCIENCES

DEPARTMENT OF BIOMEDICAL SCIENCES

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HERBAL MEDICINE AND PHARMACOLOGY UNIT

BACHELOR OF SCIENCE/BACHELOR OF SCIENCE HONOURS DEGREE IN BIOMEDICAL SCIENCES

LEVEL 2 SEMESTER 2

MAIN PROFESSIONAL EXAMINATION: Paper 1

MODULE CODE: BMS 205

MODULE NARRATION: CLINICAL PHARMACOLOGY

DATE: November/December

Duration: 2hours

Instructions to candidates

1. Answer all questions
2. All responses are to be made on the question paper
3. The paper has two (2) sections: Section A and Section B
4. In section A, only one answer is correct whereas in section B, you answer true (T) or false (F)
5. Each response is worth one (1) mark
6. In section B, there is negative marking. Half (½) a mark is deducted for every incorrect response.
7. The paper consists of 13 pages including the cover page.

Section A: Circle the correct answer, only one answer is correct.

1. The following are types of antagonists, except:
   (a) Chemical antagonist
   (b) Physiologic antagonist
   (c) Competitive antagonist
   (d) Spare antagonist
   (e) Irreversible antagonist

2. An antagonist has
   (a) Intrinsic activity and no affinity
   (b) Only intrinsic activity and no affinity
   (c) No intrinsic activity and no affinity
   (d) Affinity same as agonist and devoid of intrinsic activity
   (e) a narrow therapeutic index

3. One of the following parameters is used to indicate the ability of a drug to produce the desired therapeutic effect relative to a toxic effect?
   (a) Potency
   (b) Intrinsic activity
   (c) Therapeutic index
   (d) Efficacy
   (e) Bioavailability

4. One of the following is an action of a non-competitive antagonist?
   (a) Alters the mechanism of action of an agonist
   (b) Alters the potency of an agonist
   (c) Shifts the dose–response curve of an agonist to the right
   (d) Decreases the maximum response to an agonist
   (e) Binds to the same site on the receptor as the agonist

5. Scurvy occurs as a result of a deficiency of which vitamin?
   (a) Vitamin A
   (b) Vitamin B6
   (c) Vitamin C
   (d) Riboflavin
   (e) Vitamin E

6. The following are pharmacokinetics principle except
   (a) Bioavailability
   (b) Intrinsic activity
   (c) Half life
   (d) Area under the curve
   (e) Drug solubility

7. Which of the following statements is true:
   (a) Enzyme inhibition decreases the serum concentration of the target drug
   (b) Enzyme induction increases the serum concentration of the target drug
   (c) Volume of distribution of 15l implies drug is retained in vascular compartment
   (d) CL=Vd.Kel
   (e) Volume of distribution is the real volume of body fluid where drug is dissolved

8. The following are pharmacodynamics parameters EXCEPT:
   (a) Tachyphylaxis
   (b) Volume of distribution
   (c) Potency
   (d) Antagonism
   (e) Occupancy

9. One of the following antibiotics is a macrolide:
   (a) Streptomycin
   (b) Azithromycin
   (c) Doxycycline
   (d) Clindamycin
   (e) Chloramphenicol

10. Histamine release is associated with all of the following, EXCEPT:
   (a) Erythema
   (b) Bronchospasm
   (c) Ventricular fibrillation
   (d) Hypertension
   (e) Respiratory distress

11. Adverse effects from promethazine include all of the following, EXCEPT:
   (a) Dry mouth
   (b) Sedation
   (c) Fatigue
   (d) Urinary retention
   (e) *Torsades de pointes*

12. Pilocarpine is what type of pharmacologic agent?
   (a) Indirect muscarinic agonist
   (b) Alpha-2 adrenergic agonist
   (c) Carbonic anhydrase inhibitor
   (d) Beta adrenergic antagonist
   (e) Direct-acting muscarinic agonist

13. Which of the following molecular processes best describes the mechanism of action of benzodiazepines?

(a) potentiating the effect of GABA at chloride ion channels
(b) blocking glutamate excitation
(c) blocking the inactivation of sodium ion channels
(d) binding to opioid receptors to produce sedation
(e) potentiating the action of the inhibitory amino acid, glycine

14. Which one of the following is the primary neurotransmitter agent normally released in the sinoatrial node of the heart in response to a blood pressure increase?

(a) Acetylcholine
(b) Dopamine
(c) Epinephrine
(d) Glutamate
(e) Norepinephrine

15. A significant number of patients started on ACE inhibitor therapy for hypertension experience a side effect and must be switched to a different class of drug. What is the most common side effect?

(a) Angioedema
(b) Glaucoma
(c) Headache
(d) Incessant cough
(e) Ventricular arrhythmias

16. Which of the following statements is false about mechanism of action of antibiotics?

(a) Cephalosporins inhibit cell wall synthesis
(b) Rifampicin inhibits DNA-dependant RNA polymerase
(c) Nystatin interacts with cholesterol in the fungal cell membrane.
(d) Tetracycline inhibits protein synthesis by binding to the 30S ribosomal sub-unit.
(e) Trimethoprim inhibits dihydrofolate reductase

17. The combined antibacterial effect of two drugs is greater than the sum of their individual effects. What is this effect called?

(a) mutual antagonism
(b) indifference
(c) synergism
(d) supranormal
(e) competition

18. The continued suppression of bacterial growth after an antibiotic has been eliminated from the body is known as;

(a) bacteriostatic
(b) post-antibiotic effect
(c) time-dependent killing
(d) concentration-dependent killing
(e) synergistic effect

19. Which of the following does not define drug action;
    (a) Graded
    (b) Quantal
    (c) Ethal
    (d) Allergy
    (e) Specificity

20. One of the following statements is not correct. Which one is it?
    (a) Drug action is non-specific
    (b) Drug receptors are protein in nature
    (c) Agonists have intrinsic activity
    (d) Atropine is an antagonist
    (e) Nicotine receptors are found at the neuromuscular junctions

21. The vasoconstriction activity of adrenaline is mediated by which of the following receptors?
    (a) Muscarinic
    (b) Opiate
    (c) Alpha
    (d) Beta
    (e) Nicotinic

22. Which of the following is not used in thyrotoxicosis?
    (a) Liothyronine
    (b) Propylthiouracil
    (c) Carbimazole
    (d) Sodium thiocyanate
    (e) Potassium iodide

23. Which of the following is vitamin B12 deficiency anaemia?
    (a) Pernicious anaemia
    (b) Thalassemia
    (c) Aplastic anaemia
    (d) Microcytic hypochromic anaemia
    (e) Sickle cell anaemia

24. Which of the following is a broad-spectrum penicillin;
    (a) Benzyl penicillin
    (b) Benzathine penicillin
    (c) Procaine penicillin
    (d) Phenoxymethyl penicillin
    (e) Amoxycillin

25. Which of the following acts by binding to the 30s ribosomal subunit?
    (a) Doxycycline
    (b) Clindamycin
    (c) Chloramphenicol
    (d) Metronidazole
    (e) Levofloxacin

26. The following drugs are beta-lactamase sensitive EXCEPT;
    (a) Amoxycilin
    (b) Vancomycin
    (c) Ampicilin
    (d) Procaine penicillin
    (e) Benzylpenicillin

27. The following statements about antibacterial agents are true, EXCEPT
    a) Bactericidal agents act primarily by killing bacteria
    b) Bacteriostatic agents act primarily by killing bacteria
    c) Bacteriostatic agents act primarily by preventing bacterial multiplication
    d) Penicillin act by inhibiting cell wall synthesis
    e) Gentamycin and Amoxicillin have a synergistic effect

28. Regarding anaemia
    (a) Microcytic anaemia can be caused by alcoholism
    (b) Macrocytic anaemia is associated with thalassemia
    (c) Normocytic anaemia accompanies iron deficiency anaemia
    (d) Macrocytic anaemia is associated with inherited disorders of the haemoglobin
    (e) Normocytic anaemia is associated with kidney disease.

29. One of the following inhibit HMG-CoA reductase:
(a) Nicotinic acid
(b) Simvastatin
(c) Ezetimibe
(d) Cholestyramine
(e) Gemfibrozil

30.The following are lipid-lowering medicines, EXCEPT;
(a) Nicotinic acid
(b) Ezetimibe
(c) Rosuvastatin
(d) Cholestyramine
(e) Acarbose

Section B: Answer True (T) or False (F). An incorrect answer attracts -$^1/_2$ a mark.

1. Types of receptors include
   a) G-protein coupled receptors for examples serotonin
   b) Ion channel receptors for example Ach receptor
   c) Enzyme linked receptor eg cytokine receptor family
   d) Enzymes eg angiotensin converting enzyme
   e) Nuclear receptors

2. Concerning drug action
   (a) partial agonist produces less than full effect even with full occupation of receptor sites
   (b) In the presence of an agonist a partial agonist is an antagonist
   (c) Inverse agonist produces same effect as an agonist at high concentration
   (d) reversible antagonist increases ED50 of the agonist
   (e) irreversible antagonist increases ED50 of the agonist

3. Which of the following statement(s) is/are true definitions?
   (a) Efficacy is given by the maximum response given by an agonist.
   (b) Potency is the effect produced by a drug.
   (c) Intrinsic activity is the ability of the drug receptor complex to produce maximal response
   (d) Tolerance is not dose dependent
   (e) Tachphylaxis is not dose dependent

4. Factors affecting absorption of a drug include
   (a) drug lipid solubility
   (b) degree of ionisation
   (c) diseases
   (d) blood flow
   (e) constipation

5. Concerning drug metabolism;
   a) Epoxidation is a phase II metabolism reaction
   b) Addition of glutathione is a phase I metabolism reaction
   c) Drug metabolites from phase II reaction are excreted in urine
   d) First pass metabolism for alcohol is lower in men than women
   e) Smoking decreases the metabolism of theophylline

6. The following are narrow spectrum penicillins
   a) Vancomycin
   b) Benzathine penicillin
   c) Cloxacillin
   d) Phenoxymethyl penicillin
   e) Amoxycillin

7. The following antibacterial agents act by inhibiting protein synthesis
   a) Chloramphenicol
   b) Clindamycin
   c) Doxycycline
   d) Gentamycin
   e) Azithromycin

8. The following molecular processes describe the mechanisms of action of sedative/hypnotic agents;
(a) Potentiation of the effects of GABA at chloride ion channel
(b) Activation of glutamate
(c) Blocking of the T-type calcium ion channels
(d) Binding to opioid receptors to produce sedation
(e) Potentiation of the action of the inhibitory amino acid, glycine

9. Hyperthyroidism can be managed using the following;
   (a) Methimazole
   (b) Propranolol
   (c) Liothyronine
   (d) Thyroxine
   (e) Potassium perchlorate

10. Which of the following is true concerning proton pump inhibitors?
   (a) The bioavailability of PPIs is not affected by the presence of food
   (b) Omeprazole is metabolised in the liver by CYP2C19
   (c) Lansoprazole has greater bioavailability then omeprazole
   (d) Clarithromycin inhibits metabolism of omeprazole
   (e) Gynecomastia is an adverse effect of omeprazole

11. Regulation of blood involves;
    (a) Atrial natriuretic peptide
    (b) Aldosterone
    (c) The liver
    (d) The hypothalamus
    (e) The adrenal gland

12.The following are penicillins;
    (a) Amoxycillin
    (b) Ampicillin
    (c) Erythromycin
    (d) Doxycycline
    (e) Cloxacillin

13. The following antibacterial agents act by inhibiting cell wall synthesis;
    (a) Chloramphenicol
    (b) Fosfomycin
    (c) Bacitracin
    (d) Doxycycline
    (e) Neomycin

14. Adaptive mechanisms to increase cardiac output include;
    a) Decrease in mass of contractile elements
    b) Increase in renal sodium and water retention
    c) Decrease in ventricular contractility
    d) decrease in release of norepinephrine at adrenergic nerve endings
    e) activation of endogenous neurohormone, angiotensin II

15. The following are drugs used in the treatment of angina pectoris.
    (a) ranolaxine
    (b) Glyceryl trinitrate
    (c) Nifedipine
    (d) nitroglycerin
    (e) Propranolol

16. Which of the following is true regarding lipid lowering agents?
    (a) Fibrates are drugs of choice in mixed hyperlipidemia
    (b) Bezafibrate is safely used in combination with rosuvastatin
    (c) Bile acid binding resins are used in significant hypertriglyceridaemia
    (d) Ezetimibe is more potent than the bile acid binding resins
    (e) Statins inhibit the rate limiting step in cholesterol synthesis.

17. Cardiac glycosides may cause;
    (a) Ventricular arrhythmias
    (b) Anorexia
    (c) Bradycardia
    (d) Nausea & vomiting
    (e) Disorientation

18. Regarding chronic heart failure management;
    (a) It is important to correct systemic factors such as underlying infections
    (b) In some cases, lifestyle modification may be necessary for the patient e.g alcohol cessation
    (c) Use of other drugs such as NSAIDS and calcium channel blockers may help with relief of symptoms
    (d) Patients who cannot tolerate ACEIs can be given ARBs instead
    (e) All patients with a left ventricular ejection fraction of 40% or less, regardless of symptom severity, should receive an ACE inhibitor unless contra-indicated or not tolerated

19. Blockade of beta adrenoceptors is likely to cause;
    (a) Loss of tone in the gastro intestinal tract smooth muscle
    (b) Worsening of the condition in a patient with bronchoconstriction
    (c) Worsening of condition in a patient suffering from heart failure
    (d) A decreased ability to increase heart rate during exercise in a patient who had a cardiac transplant
    (e) Inability to increase blood flow to exercising muscles

20. The following drugs are matched to their receptors, T/F;
    (a) Diphenhydramine.....H1
    (b) Atropine.....M1
    (c) Adrenaline..... alpha1
    (d) Chlorpromazine.....D2
    (e) Metoprolol.....B1

21. Antidiabetic drugs include:
(a) Biguanides for example glibenclamide
(b) Second generation sulphonylureas for example tolbutamide
(c) First generation sulphonylureas for example gliclazide
(d) Thiazolidinediones for example rosiglitazone
(e) Arcabose

22. Types of angina include:
    (a) Stable relieved by stress
    (b) Unstable caused by rapture atherosclerotic plaque
    (c) Variant angina
    (d) Prinzmetal angina
    (e) Vasospastic angina

23. Antiretroviral drugs include
    (a) Nucleoside/Nucleotide Reverse Transcriptase Inhibitors for example zidovudine
    (b) Non-Nucleoside Reverse Transcriptase Inhibitors for example efavirenz
    (c) Protease Inhibitors for example dolutegravir
    (d) Fusion Inhibitors for example maraviroc
    (e) Integrase Inhibitors dolutegravir

24. The following drugs are used in the treatment of chronic Hepatitis C virus infection
    (a) Ledispavir
    (b) Sofosbuvir
    (c) Omeprazole
    (d) Nifedipine
    (e) Digoxin

The End