COPPERBELT UNIVERSITY

MICHEAL CHILUFYA SATA SCHOOL OF MEDICINE

DEPARTMENT OF BASIC SCIENCES

PROGRAM: MBchB

YEAR OF STUDY: 2ND YEAR

2020-2021 ACADEMIC YEAR

END OF TERM 1 TEST

COURSE: THERAPEUTICS – MBS 230

DATE: MONDAY – 22ND MARCH, 2021

TIME ALLOCATED: 2 HOURS

INSTRUCTIONS:

1. The paper contains **THREE (03)** PARTS, section A , section B and section C

2. Section **Forty (40)** questions each carrying **0.5 mark** and candidates are supposed to pick one best answer out of the five provided options for all the questions

3. Section A should be answered using the answer grid provided and in case you decide to change the answer, cross out the first choice, sign against it and then tick your newer choice

4. Section B has 10 questions of **2 marks** each (Total 20 marks) and candidates are supposed to give short answers with brief explanations where possible for **ALL** the questions

5. Section C has three questions with question one carrying **8 marks** while question 2 and 3 carry **6 marks** each and candidates are supposed to answer all

SECTION A

Answer all the questions by selecting the best option from the provided options

1. Prescription of drugs can be affected by the following except
   a) Pregnancy
   b) Disease
   c) Lactation
   d) Occupation
   e) Age

2. Regarding metabolism, the following statement is true
   a) Sulfation and glucuronidation are equally developed in different age groups
   b) Acetaminophen is primarily dependent on glucoronate conjugation for its metabolism in neonates
   c) In geriatrics, biotransformation via oxidative reaction declines more than biotransformation via drug conjugation
   d) The Sulfate conjugation is not fully developed in neonates
   e) The rate of biotransformation of most drugs is not usually lower in neonates and infants than it is in adults

3. In terms of toxicity, the following route of administration has a potential for more dangerous effects
   a) IM route
   b) IV route
   c) Epidural
   d) Sublingual
   e) Intra-articular route

4. The following is a crude form of drug
   a) Cinchona bark
   b) Quinine injection
   c) Cinchona powder
   d) Quinine powder
   e) Quinidine powder

5. Mrs Bwalya comes for review in the obstetrics clinics 7 days after delivery. After your examination, the baby is found to be doing fine and the mother's wound is healing steadily, her having undergone a ceasarian section. Her major complaint is that she is unable to produce breast milk and hence a challenge when it comes to feeding the baby.

   Which off label drug would you prescribe to help enhance the milk production?

   a) Bromocriptine
   b) Metoclopramide
   c) Ergot derivatives
   d) L - Dopa
   e) None of the above

6. The drug Doxylamine belongs to the following category of drugs according to the safety of drugs in pregnancy
   a) Category A
   b) Category C
   c) Category X
   d) Category B
   e) Category D

7. The untoward medical occurrence that may present during treatment with a medicine with no established causal relationship with treatment is called
   a) Side effect
   b) Adverse event
   c) Unexpected adverse
   d) Adverse drug reaction
   e) Serious adverse event

8. The following drugs should not be used in pregnancy except
   a) ACE inhibitors
   b) Isotretinoin
   c) Sodium valproate
   d) Metronidazole
   e) Erythromycin

9. Regarding medicine related problems and known causes, the following is a none preventable drug related problem
   a) Error in diagnosing
   b) Prescription of wrong dose of the right drug
   c) Prescription of the wrong drug
   d) Polypharmacy
   e) Age of the patient

10. One of the following will be very cardinal to enhance safe prescription of medicines in special groups
   a) It may be great to start low and go slow in cases where the maintenance dose of a medication is not established
   b) Doses of digoxin may not need to be reduced in patients with renal impairment
   c) Long acting drugs may be prescribed as a starting point which can then be transitioned to shorter acting at the point of discharge
   d) Patients requiring multiple medications may still use drugs that are inhibitors or inducers of CYP P450 hepatic metabolism
   e) Focus should more directed to the compliance to the current treatment and has previous compliance doesn't have much bearing

11. The following are true regarding adjustment of doses in hepatic or renal impairment except

a) Dose adjustment can be done by reducing the dose and increasing the interval between doses
b) Laboratory measurements of renal and hepatic function can help
c) Dose adjustment can be done by reducing the dose and reducing the interval between doses
d) Therapeutic drug monitoring through plasma concentration monitoring plays a role
e) Clinical references can help guide the clinicians in the adjustment of doses

12. The following are at risk of significant drug interactions except
a) Elderly patients
b) Seriously ill patients
c) Patients with hepatic or renal disease
d) Patient with one prescribing doctor
e) Patients on long term therapy for chronic disease (AIDS, epilepsy, diabetes)

13. Mr Peter Mulenga reports a skin eruption, which he believes, was an adverse reaction caused by cotrimoxazole, an antimicrobial agent. In trying to ascertain the association of the adverse effect occurrence to the drug, the drug is stopped. Two days afterwards, there is a notable subsiding of the adverse reaction and two weeks is allowed for a full subsiding of this adverse reaction. The drug is then re-introduced after which there is a subsequent re occurrence of the adverse reaction.

positive dechallenge

positive rechallenge

What do you believe has occurred in this case situation of Mr Peter Mulenga?
a) Positive dechallenge and negative rechallenge
b) Positive dechallenge and positive rechallenge
c) Negative dechallenge and negative rechallenge
d) Negative dechallenge and positive rechallenge
e) Positive rechallenge only

14. Preclinical studies in drug discovery will help establish all the following except
a) Harmful and beneficial effects of drugs on vital organs
b) Elucidation of the drug's mechanism of action
c) All the adverse effects humans will eventually suffer from
d) Determination of Pharmacokinetic properties
e) Prediction of how the bodies will handle these drugs

15. Preclinical studies and human studies can go alongside each other in the following conditions
a) After safe doses have been gauged
b) In phase III clinical studies
c) Where acute and subacute toxicity studies have not been revealed in animals
d) In phase II clinical studies
e) When dealing with herbal formulations which have been extensively used on the community level

16. The following can be used for prevention of adverse drug events except
    a) General predisposing factors like age, liver and kidney function, previous history of allergy, co-morbid conditions have less effect
    b) Reference materials providing information on reactions and interactions
    c) Use of very well-known drugs whose risks are familiar and can be anticipated
    d) The therapy should not be changed from known drugs to unfamiliar ones without good reasons
    e) Risks and benefits of any drugs being planned for use to be weighed

17. Spontaneous reporting of adverse drug events has all the advantages apart from;
    a) It being inexpensive
    b) It covering all drugs
    c) It helping to identify immediate effects
    d) Its ability to trigger the eagerness and response in health workers, it being voluntary
    e) It identifying continuing effects

18. The following is a phase III clinical study activity
    a) Utilization of double blind studies
    b) Determination of pharmacokinetic properties
    c) Gauging of doses of the drug
    d) Statistical analysis being done at the end of the phase
    e) Same study sight and same investigators being used

19. In which phase of drug safety studies is a drug first administered to group of people with the disease being targeted by the drug under study
    a) Phase I
    b) Phase II
    c) Phase III
    d) Phaes IV
    e) Between phase II and Phase III

20. The following are CYP450 inducers except
    a) Rifampicin
    b) Ciprofloxacin
    c) Carbamazepine
    d) Phenobarbitone
    e) Phenytoin

21. On drug absorption the following is true
    a) Facilitated diffusion needs both carrier molecule and energy
    b) Drugs cannot be transported across the concentration gradient in active transport
    c) Concentration and surface area affects absorption of drugs
    d) The molecular weight of drugs does not affect aqueous diffusion
    e) Aqueous is part of the facilitated diffusion while lipid diffusion is a form of passive diffusion

22. The following affects drug distribution [redacted]pt
    a) Lipid solubility
    b) Blood flow
    c) Molecular size
    d) Plasma protein binding
    e) All of the above

23. The following drug is metabolized through a reductive reaction
    a) Penicillins
    b) Chloramphenicol
    c) Caffeine
    d) Esmolol
    e) Theophylline

24. All the statements are true about bioavailability except
    a) It is the amount of drug that reaches the systemic circulation in an unchanged form
    b) Rate of disintegration and dissolution affects bioavailability
    c) Certain foods capable of inactivating or sequester gastric acid can affect bioavailability
    d) Bioavailability is the fraction of the drug that reaches systemic circulation in an active form
    e) Orally administered drugs have variations in bioavailability

25. On absorption and distribution of drugs, the following statement is true
    a) Ionized drugs are easily absorbed through the membrane lipids
    b) Drugs with weak acidic properties are not readily absorbed in the stomach
    c) P-glycoproteins enhance drug distribution and helps optimize therapeutic outcome
    d) Plasma protein binding is the major factor affecting drug distribution
    e) Higher protein binding will have less effect on the tissue activity of the drug

26. CYP450 inhibitors will cause the following
    a) Reduce the serum concentration of other drugs whose metabolism is dependent on the CYP enzyme
    b) Have no clinical significance on the therapeutic outcome
    c) Impediment on drug metabolism thus leading to enhanced drug toxicity
    d) The call to increase the dose for drugs whose metabolism is dependent on the CYP enzyme
    e) Optimize treatment outcome with no alarming cause of toxicity

27. A none competitive antagonist can best be described as
    a) Irreversibly binds to the agonist site by forming a covalent
    b) A ligand that binds to the same active catalytic site as the endogenous substrate
    c) Its binding is surmountable by increasing the dose of the agonist
    d) Produces the effect that mimic the effect endogenous ligand agonist
    e) Its effect can either be reversible or non-reversible

28. The measure of the strength of the drug receptor complex is [illegible] receptor binding
    a) Drug specificity
    b) Tissue location
    c) Primary amino acid sequence
    d) Affinity
    e) Potency

29. In a synoptic study, it was established that different drugs can be used at their different specific doses to treat a migraine headache. The following were the drugs and their required doses; BA – 8mg, BB – 4mg, BC – 6mg, BD – 12mg, BE – 7.5mg

    Which one of these has the greatest potency?
    a) BA
    b) BB
    c) BC
    d) BD
    e) BE

30. Gama amino butyric acid (GABA) by nature reduces the signal transduction. What type of ligand is it?
    a) Full agonist
    b) Partial agonist
    c) Competitive antagonist
    d) Noncompetitive antagonist
    e) Inverse agonist

31. Exposure of a receptor to an agonist for a long time may lead to the following
    a) Super sensitivity
    b) Down regulation
    c) Upregulation
    d) Desensitization
    e) Resistance

32. Pharmacokinetic tolerance is caused by the following
    a) Downregulation
    b) Desensitization
    c) Resistance
    d) Upregulation
    e) Super sensitivity

33. Antagonists have the following
    a) Efficacy only
    b) Both affinity and Efficacy
    c) Affinity alone

d) Exhibition of both receptor affinity and efficacy depending on the drug concentration
e) More prompt effect than agonists

34. In pharmacodynamics, the following are key in the processes leading to the final actualization of the drug's effects except
a) Signal transduction
b) Receptor binding
c) Second messengers
d) Drug absorption
e) Receptor affinity

35. The following may affect the selection of the route of administration except
a) Period from the starting of symptom presentation
b) Site of infection
c) Severity of condition
d) Physicochemical properties of drugs
e) Presenting symptoms

36. The following are true about oral route except
a) Relatively safer
b) Adverse effects may be more
c) Economical
d) Absorption of drugs can vary widely
e) Bioavailability is varied

37. Regarding receptor binding, the following is true
a) Not all drugs need binding sites to actualize their pharmacological activity
b) Orphan receptors do not have any significance in therapeutics
c) A competitive inhibitor is a ligand that binds to various the same active catalytic site as the endogenous substrate
d) The receptor affinity does not affect drug potency
e) Concentration of the drug does not influence the receptor binding

38. The following is an example of a drug extracted from microorganisms
a) Quinine
b) Insulin
c) Lithium
d) Streptomycin
e) Atropine

39. The following is a generic name
a) Aspirin
b) Acetyl salicylic acid
c) Coartem
d) Panadol
e) B and C

40. The drug administered in this route will produce both a topic effect and also systemic effect
    a) Rectal
    b) Skin application
    c) Eye application
    d) Mouth gaggle
    e) Vagina

SECTION B

Answer all questions by giving brief descriptions where required

1. Mr B aged 79 comes into your consulting room presenting with symptoms of having difficulties in sleeping and those of anxiety. As an intern, you consult from your registrar who recommends a benzodiazepine and before he can finish explaining, his phone goes off and you remember that he mentioned to you that he is at the farm where he is unable to charge his phone as he had forgotten his charger. After consulting with the pharmacy, you are told that currently, loranzepam, temazepam and diazepam are in stock.

    a) Which drug of choice would you prescribe for Mr B?

    b) Explain the rationale as to why you have decided to prescribe the drug you have chosen above?

2. In relating to usage of drugs in pregnancy;
    a) What are category C and state whether they can be used or not drugs in relating to usage of drugs in pregnancy? (2)

    b) Discuss the usage of antiepileptic drugs in pregnancy. (6)

3. Drug DBX has been in use and clinically been proved to be very effective for its intended and documented labelled use. Lately there has been a pattern of events in patients using this drug and a preliminary causal effect is being established.
    a) What step are you likely to take as a clinician over these reported reactions to the drug DBX?
    b) Briefly explain the importance of the process above? (4)

4. Briefly elucidate the off label indication of drugs by also giving some examples (2)

5. Briefly discuss the effects P-glycoprotein (ATP binding cassettes - ABCs) on drug distribution highlighting on some examples of drugs that can work against them

6. Describe a prodrug and give an example (2)

7. Define what orphan receptors are and highlight on their significance (3)

8. Mention the different types of drug nomenclature (4)

9. Give the different sources of drugs with specific examples (6)

10. What is a drug delivery system? (1)

SECTION C

Answer all the questions

1. You are a district director of health in Kasempa and you notice there is a herb people are championing as an aphrodisiac and fertility drug in the district. In your professional quest, you take keen interest and sensitize the community on the proper usage of drugs and the processes involved before the drug can be permitted on the market. Today you have received community representatives and activists who desire to be further guided on the process

   a) Briefly discuss with them systematic stages involved in drug discovery approach, the process involved up to the market. (6)
   b) Give an elaboration of what post market surveillance is and the role it plays (6)

2. Elucidate the polymorphism phenomena in pharmacology along the following themes;
   a) what it really is (2)
   b) Highlights of examples in which this phenomena has been well studied and established and interventions taken to remedy the posed challenges (6)
   c) The potential it has in provision of drug therapy (2)

3. Discuss drug metabolism in line with the following
   a) Enzymatic metabolism with more focus on CYP 450 microsomal enzyme (7)
   b) Effects of other drugs on this enzyme and the impact on treatment (2)
   c) Examples of drugs which affect this enzyme and possible interventions to counter the effect (3)