Of each of the following questions, select ONE BEST answer:

1. A drug may act by all the following mechanisms EXCEPT: Lec 2
- **A.** Interaction with protein macromolecules embedded in the cell membranes
- **B.** Interaction with cell membrane ion channels
- **C.** Interaction with intracellular enzymes
- **D.** Interaction with cell membrane phospholipids
- **E.** Interaction with gene functions

2. Ion-channel-linked receptors (direct ligand-gated ion channels) are characterized by: Lec 2
- **A.** They are the type of receptors principally present in autonomic ganglia and skeletal ms motor end plate
- **B.** They are the type of receptors principally present in vascular endothelium
- **C.** They are rosette-shaped structures consist of 7 membrane subunits
- **D.** Their response is slower than other receptors
- **E.** Activation of these receptors leads to activation of a second messenger

3. Which of the following is classified as belonging to the tyrosine kinase family of receptors: Lec 2
- **A.** GABA receptors
- **B.** β-Adrenergic receptors
- **C.** Insulin receptors
- **D.** Nicotinic acetylcholine receptors
- **E.** Hydrocortisone receptors

4. All the following are true for intracellular (DNA-linked) receptors EXCEPT: Lec 2
- **A.** They regulate transcription of genes inside the nucleus
- **B.** Their response is very fast but persists for long time
- **C.** Their agonists must enter inside the cell to reach them inside the nucleus
- **D.** Sex hormones act on these types of receptors
- **E.** Corticosteroids act on these types of receptors

5. The following statements are true for graded dose-response relationship EXCEPT: Lec 3
- **A.** It is the response to most drugs
- **B.** The response is directly proportional to drug concentration (linear relation)
- **C.** It could be tested in one animal
- **D.** It can be used for comparing the potencies and efficacies of drugs
- **E.** It can be used for calculation of the LD_{50} of drugs

6. The following statements are true for quantal dose-response relationship EXCEPT: Lec 4
- **A.** It is the response to anticonvulsant and antiarrhythmic drugs
- **B.** The response to the drug is not directly proportional to drug concentration (all-or-none)
- **C.** It could be tested in one animal
- **D.** It helps in calculation of the ED50 and LD50 of drugs
- **E.** It helps in estimation of the degree of drug safety

7. When a drug has a steep dose-response curve, this means:
- **A.** The drug is lethal
- **B.** The drug is expensive
- **C.** The drug is efficacious
- **D.** The drug is safe
- **E.** Minimal change in the dose can lead to dramatic effect.

8. The following statements are true for drug's therapeutic index EXCEPT: Lec 4
- **A.** It is the relation between the lethal dose in 50% of animals to the curative dose in 50% of them
- **B.** The lower the TI, the safer will be the drug.
- **C.** It should be done to any drug before it's being approved for human use

D. For theoretically useful drugs, it must be greater than 1
E. It could be applied in animal testing

9. The following is true for competitive antagonism: Lec3
A. It never occurs with enzymes
B. Is the same as physiological antagonism
C. The agonist can never abolish the effect of the antagonist
D. Is best exemplified by the use of neostigmine to treat curare toxicity
E. Best described as non-surmountable process

10. A drug is said to be reversible antagonist when: Lec3
A. It blocks the receptors by making covalent bonds with them
B. The duration of blockade is too long
C. Increasing the dose of the agonist will reverse the block
D. The response curve of the agonist in presence of this drug is not parallel to that of the agonist alone
E. Termination of the drug effect depends on synthesis of new receptors

11. The interaction that may occur between acidic and basic drugs is called: Lec3
A. Chemical antagonism
B. Physical antagonism
C. Physiological antagonism
D. Biological antagonism
E. Receptor antagonism

12. The following is true for interactions between drugs:
A. Is not harmful if occurred between drugs having steep dose-response curves
B. Is not harmful if occurred between drugs having narrow therapeutic ratios
C. Is not harmful if occurred between drugs undergoing zero-order kinetics
D. May lead to valuable therapeutic effects
E. Is described as addition if the action of one drug abolishes the effects of another

13. A drug may interact with ion channels by all of the following mechanisms EXCEPT:
A. The drug may change the ion channel structure
B. The drug may block the channel physically
C. The drug may change an intracellular ATP on which the channel depends
D. The ion channel may be part of ion channel-linked receptors
E. The ion channel may be modulated by G-protein linked receptors

14. Failure of the patient to breath after surgical operation may be due to: Lec9
A. Pseudocholinestrase deficiency
B. Methemoglobin reductase deficiency
C. G-6-PD deficiency
D. Vitamin K epoxide reductase deficiency
E. Monoamine oxidase deficiency

15. Hemolysis that may occur with sulfonamides therapy may be due to: Lec4
A. Pseudocholinestrase deficiency
B. Methemoglobin reductase deficiency
C. G-6-PD deficiency
D. Vitamin K epoxide reductase deficiency
E. Monoamine oxidase deficiency

16. Severe myelosuppression following 6-mercaptopurine therapy is most likely due to:
A. Pseudocholinestrase deficiency
B. Methemoglobin reductase deficiency
C. G-6-PD deficiency
D. Vitamin K epoxide reductase deficiency
E. Thiopurine methyltransferase deficiency

17. Hepatic toxicity that may accompany isoniazide therapy may be due to: Lec9

26. Metabolism (biotransformation) of drugs can lead to all the following results EXCEPT:

A. Conversion of active compound into inactive metabolites
B. Conversion of active compound into active metabolites
C. Conversion of inactive compound into active metabolites
D. Conversion of non-toxic compound into toxic metabolites
E. Conversion of water-soluble compound into lipid-soluble metabolites

27. All the following statements are true for First-order kinetics EXCEPT:

A. Apply to most drugs in clinical use
B. Apply to salicylate (aspirin) metabolism within small dose.
C. The concentration versus time curve is non-linear.
D. The rate of elimination depends on plasma concentration of the drug
E. Steady state plasma concentration can be reached after 5 half lives

28. All the following statements are true for zero-order kinetics EXCEPT:

A. Elimination rate is independent of the dose
B. Elimination depends on saturable enzyme system
C. Plasma concentration of the drug cannot be expected at any time
D. The t1/2 of the drug is not constant
E. There is no fear from drug cumulation or interactions

29. Drugs X and Y have the same mechanism of diuretic action. Drug X in a dose of 5mg produces the same magnitude of diuresis as 500 mg of drug Y. This suggests that:

A. Drug Y is less efficacious than drug X
B. Drug X is about 100 times more potent than drug Y.
C. Toxicity of drug X is less than that of drug Y.
D. Drug X is a safer drug than drug Y.
E. Drug X will have a shorter duration of action than drug Y because less of drug X is present for a given effect.

30. Which of the following terms best describes the antagonism of leukotriene's bronchoconstrictor effect (mediated at leukotriene receptors) by terbutaline (acting at adrenoceptors) in a patient with asthma?

A. Pharmacologic antagonist.
B. Partial agonist.
C. Physiologic antagonist.
D. Chemical antagonist.
E. Noncompetitive antagonist.

31. Which of the following provides information about the variation in sensitivity to the drug within the population studied?

A. Maximal efficacy.
B. Therapeutic index.
C. Drug potency.
D. Graded dose-response curve.
E. Quantal dose-response curve.

32. Which of the following provides information about the largest response a drug can produce, regardless of dose?

A. Drug potency.
B. Maximal efficacy.
C. Mechanism of receptor action.
D. Therapeutic index.
E. Therapeutic window.

33. A pro-drug is:

A. The prototype member of a class of drugs.
B. The oldest member of a class of drugs
C. An inactive drug that is transformed in the body to an active metabolite.
D. A drug that is stored in the body tissues and is then gradually released in the circulation.
E. Ionized drug trapped in breast milk.

34. If the rate of infusion of a drug were doubled, what response in the steady

state concentration would be expected?

A. Remain unchanged
B. Doubled
C. Increase 50%
D. Decrease 50%
E. Decrease 100%

35. Half-life of a drug may be helpful to determine:

A. Elimination of the drug
B. Level of absorption
C. Rate of absorption through the GIT
D. Time to reach the steady state
E. Distribution into body systems.

36. What determines the degree of movement of a drug between body compartments?

A. Partition constant
B. Degree of ionization
C. pH
D. Molecular size
E. All of the above

37. For intravenous (IV) dosages, what is the bioavailability assumed to be?

A. 0%
B. 25%
C. 50%
D. 75%
E. 100%

38. Which of the following can produce a therapeutic response? A drug that is:

A. Bound to plasma albumin
B. Concentrated in the bile
C. Concentrated in the urine
D. Not absorbed from the GI tract
E. Unbound to plasma proteins

39. Aspirin is a weak organic acid with a pKa of 3.5. What percentage of a given dose will be in the lipid-soluble form at a stomach pH of 1.5?

A. About 1%
B. About 10%
C. About 50%
D. About 90%
E. About 99%

40. Concerning the renal excretion of drugs:

A. Drugs that are ionized in the renal tubules are more likely to undergo passive reabsorption.
B. Low MW drugs are much more likely to be actively secreted than filtered.
C. Only the fraction of the drug that is unbound (free) to plasma proteins is filtered by the glomerulus.
D. Decreasing urinary pH enhance excretion of weakly acidic drugs.
E. Renal clearance cannot exceed the GFR (125 ml/min).

41. In which of the following cases could a graded dose-response curve be constructed?

A. Prevention of convulsions
B. Prevention of arrhythmias
C. Reduction of death
D. Reduction of fever
E. Relief of insomnia

42. Which of the following can be used as a relative indicator of the margin of safety of a drug?

A. T.I.
B. LD50
C. ED50
D. EC50
E. TD50

43. Flurazepam has a pKa of 8.2. What percentage of flurazepam will be ionized at a urine pH of 5.2?

A. 0.1%
B. 1.0%
C. 50%
D. 99%
E. 99.9%

44. Which route of administration is most likely to subject a drug to first pass metabolism?

A. Intravenous
B. Sublingual
C. Oral

D. Inhalation
E. Intramuscular

45. If a drug was given by a constant infusion rate, which of the following factors determines how long it will take for the drug to reach a steady-state concentration (Cpss) in the blood?
A. Apparent volume of distribution
B. Bioavailability
C. Clearance
D. Half-life
E. Infusion rate (mg of drug/min)

46. Which of the following best describes what the term "tachyphylaxis" means?
A. An increase in the rate of the response, for example, an increase of the rate of muscle contraction
B. Immediate hypersensitivity reactions (i.e., anaphylaxis)
C. Prompt conformational changes of the receptor such that agonists, but not antagonists, are able to bind and cause a response
D. Quick and progressive rises in the intensity of drug response, with repeated administration, even when the doses are unchanged
E. Rapid development of tolerance to the drug's effects

47. Drug A undergoes a series of Phase I metabolic reactions before being eliminated. Which of the following statements best describes the characteristics of Drug A, or the role of Phase I reactions in its metabolism?
A. Complete metabolism of Drug A by Phase I will yield products that are less likely to undergo renal tubular reabsorption
B. Drug A is a very polar substance
C. Drug A will be biologically inactive until it is metabolized
D. Phase I metabolism of Drug A involves conjugation with glucuronic acid or sulfate
E. Phase I metabolism of Drug A will increase its intracellular access and actions

48. The FDA assigns the letters A, B, C, D, and X to drugs approved for human use. To which of the following does this classification apply?
A. Amount of dosage reduction needed as serum creatinine clearances fall
B. Fetal risk when given to pregnant women
C. Amount of dosage reduction needed in presence of liver dysfunction
D. Relative margins of safety/therapeutic index
E. The number of unlabeled uses for a drug

49. Which effect may lead to toxic reactions when a drug is taken continuously or repeatedly?
A. Refractoriness
B. Cumulative effect
C. Tolerance
D. Tachyphylaxis
E. Intolerance

50. Tolerance and drug resistance can be a consequence of:
A. Change in receptors, loss of them or exhaustion of mediators
B. Increased receptor sensitivity
C. Decreased metabolic degradation
D. Decreased renal tubular secretion
E. Activation of a drug after hepatic first-pass

51. If two drugs with the same effect, taken together, produce an effect that is equal in magnitude to the sum of the effects of the drugs given individually, it is called as:
A. Antagonism
B. Potentiation
C. Synergism
D. Additive effect
E. Supersensitivity

52 All of the following statements about efficacy and potency are true EXCEPT:

lec 4

A. Efficacy is usually a more important clinical consideration than potency

B. Efficacy is the maximum effect of a drug

C. Potent drugs usually given in small dose.

D. Potency is a comparative measure, refers to the different doses of two drugs that are needed to produce the same effect

E. The ED50 is a measure of drug's efficacy

Answers

1 D	11 A	21 E	31 E	41 D
2 A	12 D	22 B	32 B	42 A
3 C	13 A	23 E	33 C	43 E
4 B	14 A	24 C	34 B	44 C
5 E	15 C	25 A	35 D	45 D
6 C	16 E	26 E	36 E	46 E
7 E	17 E	27 C	37 E	47 A
8 B	18 C	28 E	38 E	48 B
9 D	19 A	29 B	39 E	49 B
10 C	20 D	30 C	40 C	50 A
				51 D
				52 E