



Punjab Technical University

Maximum Marks: 90

Time: 90Mins.

Entrance Test for Enrollment in Ph.D Programme

Important Instructions

- Fill all the information in various columns, in Capital letters, with blue/black point pen for attempting the questions
- Use of calculators is not allowed.
- Make attempt by writing the answer in capital Letters in the box against each question number.
- All questions are compulsory. Each Question has only one right answer. No Negative marking for wrong answers.
- Questions attempted with two or more options/answers will not be evaluated.

Stream:Pharmacy.....

DisciplinePharmacy

Name

Fathers Name

Roll NumberDate: 13-07-2014

Signature of Candidate:

Signature of Invigilator

1. In nail polish, which one of the following polymers is used as a film-former?

- (A) Nitrocellulose (B) Polylactic acid
(C) Hydroxypropyl methylcellulose (D) Cellulose acetate phthalate

2. It is required to maintain a therapeutic concentration of 10 $\mu\text{g/ml}$ for 12 h of a drug having half life of 1.386 h and V_d of 5 L. The dose required in a sustained release product will be

- (A) 600 mg (B) 300 mg
(C) 30 mg (D) 60 mg

3. Barbiturates with substitution at the following position possess acceptable hypnotic activity.
- (A) 1,3-Disubstitution (B) 5,5-Disubstitution
(C) 1,5-Disubstitution (D) 3,3-Disubstitution
4. Which of the following is the starting material for the synthesis of amitriptyline?
- (A) Phthalic anhydride (B) Phthalamic acid
(C) Terephthalic acid (D) Phthalimide
5. In which of the following enzyme-catalyzed steps of TCA cycle, incorporation of elements of water into an intermediate of the cycle takes place?
- (A) Citrate synthase (B) Aconitase
(C) Maleate dehydrogenase (D) Succinyl CoA synthase
6. Which one of the following drugs is prescribed for the treatment of Philadelphia chromosome positive patients with chronic myeloid leukemia?
- (A) Imatinib (B) Methotrexate
(C) Pentostatin (D) L-Asparaginase
7. Which of the following monoclonal antibodies is prescribed for patients with non-Hodgkin's lymphoma?
- (A) Infliximab (B) Abciximab
(C) Gemtuzumab (D) Rituximab
8. Identify the drug which is NOT used in the treatment of malaria caused by *Plasmodium falciparum*.
- (A) Artemisinin (B) Primaquine
(C) Quinine (D) Mefloquine
9. The deflection of positive ions formed in a mass spectrometer by electric and magnetic fields depends upon its
- (A) Mass (B) Charge

(C) Velocity (D) Mass, charge and velocity

10. Paracytic stomata are quite often found in the members of the family

(A) Solanaceae (B) Scrophulariaceae

(C) Rubiaceae (D) Ranunculaceae

11. Which of the following volatile oils has specific gravity higher than water?

(A) Fennel (B) Cinnamon

(C) Clove (D) Dill

12. Which of the following starches has the largest grain size?

(A) Rice (B) Potato

(C) Wheat (D) Maize

13. What quantities of 95 % v/v and 45 % v/v alcohol are to be mixed to make 800 ml of 65 % v/v alcohol?

(A) 480 ml of 95% and 320 ml of 45% alcohol

(B) 320 ml of 95 % and 480 ml of 45 % alcohol

(C) 440 ml of 95 % and 360 ml of 45 % alcohol

(D) 360 ml of 95 % and 440 ml of 45 % alcohol

14. Purity of water can be assessed by determining one of its following properties

(A) pH (B) Refractivity

(C) Conductivity (D) Viscosity

15. Myasthenia gravis is diagnosed with improved neuromuscular function by using

(A) Donepezil (B) Pancuronium

(C) Atropine (D) Edrophonium

16. Which one of the following drugs specifically inhibits calcineurin in the activated T lymphocytes?

- (A) Daclizumab (B) Prednisone
(C) Sirolimus (D) Tacrolimus

17. Coulter counter is used in the determination of

- (A) Particle surface area (B) Particle size
(C) Particle volume (D) All of the above

18. In the mixing of thymol and menthol, which of the following types of incompatibilities occurs?

- (A) Chemical (B) Therapeutic
(C) Physical (D) Tolerance

19. Cardiac glycosides have the following configuration in the aglycone part of the steroid nucleus

- (A) $5\alpha, 14\alpha$ - (B) $5\alpha, 14\beta$ -
(C) $5\beta, 14\alpha$ - (D) $5\beta, 14\beta$ -

20. Anisosteric replacement for carboxylic acid group is

- (A) Pyrrole (B) Isoxazole
(C) Tetrazole (D) Phenol

21. Ergot is the sclerotium of the fungus

- (A) *Claviceps purpurea* (B) *Claviceps notatum*
(C) *Penicillium chrysogenum* (D) *Penicillium notatum*

22. Which of the following is a liquid alkaloid?

- (A) Berberine (B) Morphine
(C) Ajmalicine (D) Arecoline

23. Which of the following alkaloids are derived from ornithine?
- (A) Thebaine (B) Cocaine
(C) Reserpine (D) Quinine
24. The common structural feature among the three categories of anticonvulsant drugs barbiturates, succinimides and hydantoins is
- (A) tetrahydropyrimidine (B) imidazolidinone
(C) dihydropyrimidine (D) ureide
25. 3,4-Benzpyrene present in cigarette smoke reduces the therapeutic activity of diazepam by
- (A) Altering excretion
(B) Binding to plasma proteins
(C) Inhibiting metabolism
(D) Increasing the activity of liver microsomal enzymes
26. Which one of the following drugs is NOT a typical anti-psychotic agent?
- (A) Risperidone (B) Haloperidol
(C) Chlorpromazine (D) Flupentixol
27. Ganciclovir is mainly used for the treatment of infection caused by
- (A) Cytomegalovirus (B) *Candida albicans*
(C) Parvo virus (D) Hepatitis B virus
28. Which one of the following is not a plant growth promoter?
- (A) Kinetin (B) Abscisic acid
(C) Gibberellic acid (D) 2,4-Dichlorophenoxyacetic acid
29. The characteristic of non-linear pharmacokinetics include
- (A) Area under the curve is proportional to the dose
(B) Area under the curve is not proportional to the dose
(C) Elimination half-life remains constant

(D) Amount of drug excreted through remains constant

30. The healing agent used in hand creams is

- (A) Bees wax (B) Urea
(C) Soft paraffin (D) Stearyl alcohol

31. Measurement of inulin renal clearance is a measure for

- (A) Effective renal blood flow (B) Glomerular filtration rate
(C) Active renal secretion (D) Renal drug excretion rate

32. Select the correct combination of drugs for the treatment of patients suffering from Hepatitis C.

- (A) Interferon with Ribavirin (B) Interferon with Zidovudine
(C) Interferon with Stavudine (D) Interferon with Lamivudine

33. Aliskiren acts by inhibiting the

- (A) release of rennin (B) conversion of Angiotensin I to II
(C) binding of Angiotensin II to the receptor (D) action of aldosterone

34. The chemical behaviour of morphine alkaloid is

- (A) Acidic (B) Basic
(C) Neutral (D) Amphoteric

35. At physiological pH, which of the following compounds would be mostly in

- (A) Cationic form (B) Unionized form
(C) Zwitterionic form (D) Anionic form

36. A given Gram-positive bacterium is differentiated from Gram-negative bacteria by Gram staining. This is because its cell wall contains

- (A) Lysozyme (B) Teichoic acid
(C) Membrane proteins (D) Lipid A

37. In multistation punching machine, the upper as well as lower punches are connected by
(A) Revolving belts (B) Turrets
(C) Wire meshes (D) Cams
38. Grade A filter, in a HEPA filter is used for
(A) Aseptic preparation and filling
(B) Background room used for preliminary activities
(C) Filtering liquid preparations
(D) Handling of components after washing
39. Florentine receiver separates liquids based on
(A) Molecular weight (B) Sedimentation
(C) Density (D) Freezing point
40. Which of the following substances is used for converting normal silica gel to reversed-phase silica gel?
(A) Benzene (B) Glycerine
(C) Silicone oil (D) Ether
41. Murexide test is used to detect which class of the following alkaloids?
(A) Tropane (B) Purine
(C) Quinoline (D) Indole
42. Haemolytic index is used to determine the content of
(A) Steroids (B) Saponins
(C) Flavonoids (D) Mucilages
43. Thioglycolic acid-like compounds have applications in following type of cosmetic formulations
(A) Depilatory preparations (B) Epilatory preparations
(C) Vanishing creams (D) Skin tan preparations

44. Quaternary structure in protein molecules refers to
- (A) Protein folding in single subunit proteins
 - (B) Specific arrangement of multiple subunits in multi-subunit proteins
 - (C) Formation of molten globules
 - (D) Arrangement of multiple domains in a single polypeptide chain
45. Phase I clinical studies of a drug under development is generally carried out on
- (A) At least 10,000 people from different ethnic communities and a wide range of age groups
 - (B) A group of 500-1000 patients
 - (C) A small group of 20-100 healthy male and female volunteers
 - (D) Reliable in-vitro cell-lines derived from patients
46. Which of the following non-opioid analgesics is a prodrug?
- (A) Piroxicam
 - (B) Celecoxib
 - (C) Nabumetone
 - (D) Ketorolac
47. Ethambutol molecule has
- (A) Two chiral centers and 3 stereoisomers
 - (B) One chiral center and 2 stereoisomers
 - (C) Two chiral centers and 2 stereoisomers
 - (D) Two chiral centers and 4 stereoisomers
48. A compound will be sensitive to IR radiation only when one of the following properties undergo transition on
- (A) Dipole moment
 - (B) Dielectric constant
 - (C) Polarizability
 - (D) Refractivity
49. X-ray crystallographic analysis of an optically active compound determines its
- (A) Optical rotatory dispersive power
 - (B) Relative configuration
 - (C) Absolute configuration
 - (D) Optical purity

50. Which one of the following statements is wrong?
- (A) A singlet or triplet state may result when one of the electrons from the HOMO is excited to higher energy levels
 - (B) In an excited singlet state, the spin of the electron in the higher energy orbital is paired with the electron in the ground state orbital
 - (C) Triplet excited state is more stable than the singlet excited state
 - (D) When the electron from the singlet excited state returns to ground state, the molecule always shows fluorescence phenomenon
51. Liposomes, used as carriers for drugs and macromolecules in pharmaceutical formulations, are
- (A) A shallow compartment moulded from a drug impermeable system and rate controlling polymeric membrane
 - (B) Hydrophilic or lipophilic polymer matrix with a drug reservoir
 - (C) Phospholipids dispersed gently in aqueous medium to obtain multilamellar vesicles
 - (D) Microporous membrane made from ethylene / vinyl acetate polymer
52. Humectants added in cosmetic preparations generally act by
- (A) Hydrogen bond formation
 - (B) Covalent bond formation
 - (C) Complex formation
 - (D) The action of London forces
53. Chlor-zinc-iodide is used for identifying
- (A) Cellulosic walls
 - (B) Lignified walls
 - (C) Suberized walls
 - (D) Cutinized walls
54. Indole acetic acid, in the plants, is derived from the amino acid
- (A) Phenyl alanine
 - (B) Serine
 - (C) Leucine
 - (D) Tryptophan

55. Identify one rational combination which has clinical benefit.

- (A) Norfloxacin-Metronidazole (B) Alprazola-Paracetamol
(C) Cisapride-Omeprazole (D) Amoxycillin-Clavulanic acid

56. Stevens Johnson syndrome is the most common adverse effect associated with which one of the following category of drugs?

- (A) Sulphonamides (B) Macrolides
(C) Penicillins (D) Tetracyclines

57. The height of lower edge of the blade from the bottom of the cylindrical vessel in the official dissolution test apparatus is

- (A) 18 to 22mm (B) 23 to 27mm
(C) 20 to 24mm (D) 25 to 29mm

58. As per Drugs and Cosmetics Act and Rules, Good Manufacturing Practice is included under the Schedule

- (A) W (B) P
(C) S (D) M

59. The applicability of Noyes-Whitney equation is to describe

- (A) First order kinetics (B) Zero order kinetics
(C) Mixed order kinetics (D) Dissolution rate

60. Which filler cannot be used for the preparation of tablets for amine containing basic drugs to avoid discoloration of the tablets?

- (A) Lactose (B) Microcrystalline cellulose
(C) Starch (D) Dicalcium phosphate

61. Farnesyl pyrophosphate is the precursor for the formation of

- (A) Sesquiterpenoids (B) Diterpenoids
(C) Monoterpenoids (D) Diterpenoids

62. *Digenea simplex*, used as anthelmintic in Japanese traditional medicine, is a
- (A) Brown algae (B) Red algae
(C) Green algae (D) Brownish green algae
63. Bloom strength is used to check the quality of
- (A) Lactose (B) Ampoules
(C) Hardness of tablets (D) Gelatin
64. Rabies vaccine (living) is prepared using
- (A) Sheep blood (B) Mice lymph
(C) Horse plasma (D) Fertile eggs
65. Increased risk of atherosclerosis is associated with decreased serum levels of
- (A) LDL (B) HDL
(C) Triglycerides (D) VLDL
66. A bone-resorption-inhibiting peptide hormone administered as a nasal spray is
- (A) Cortisol (B) Alendronate
(C) Calcitonin (D) Calcitriol
67. Which one of the following fixed oils is obtained by hot expression method?
- (A) Castor (B) Linseed
(C) Olive (D) Theobroma
68. Which one of the following statements is WRONG?
- (A) The gyromagnetic ratio of ^1H is lesser than that of ^{13}C
(B) ^{12}C nucleus is not magnetically active
(C) Both ^{13}C and ^1H have same spin quantum numbers
(D) ^{13}C NMR is less sensitive than ^1H NMR

69. The role of borax in cold creams is as
- (A) Antioxidant (B) Provider of fine particles to polish skin
(C) *In-situ* emulsifier (D) Antimicrobial agent
70. Drugs following one compartment open model pharmacokinetics eliminate
- (A) Bi-exponentially (B) Tri-exponentially
(C) Mono-exponentially (D) Non-exponentially
71. Cellulose consists of
- (A) α -1:4 linked linear chains of glucose residues
(B) α -1:4 linked branched chains of glucose residues
(C) β -1:4 linked linear chains of glucose residues
(D) β -1:4 linked branched chains of glucose residues
72. Which of the following drugs contains protoalkaloids?
- (A) Ma-Huang (B) Henbane
(C) Cortex Chinae (D) Deadly Nightshade
73. Nicotinic action of acetylcholine is blocked by
- (A) Atropine (B) Carvedilol
(C) Neostigmine (D) d-Tubocurarine
74. Which one of the following is a selective serotonin reuptake inhibitor?
- (A) Imipramine (B) Iproniazide
(C) Fluoxetine (D) Naphazoline
75. Which one of the following drugs does NOT act through G-protein coupled receptors?
- (A) Epinephrine (B) TSH
(C) Dopamine (D) Insulin

76. Which one of the following drugs is most effective in preventing transmission of HIV virus from mother to the foetus?

- (A) Lamivudine (B) Zidovudine
(C) Indinavir (D) Ribavirin

77. Which one of the following is a flocculating agent for a negatively charged drug?

- (A) Aluminium chloride (B) Bentonite
(C) Tragacanth (D) Sodium biphosphate

78. Which one of the followings is a plasminogen activator?

- (A) Tranexamic acid (B) Streptokinase
(C) Aminocaproic acid (D) None of the above

79. In IR spectrum, the functional group region ranges between

- (A) 4000cm⁻¹ to 900cm⁻¹ (B) 4000cm⁻¹ to 1400cm⁻¹
(C) 1400cm⁻¹ to 900cm⁻¹ (D) 4000cm⁻¹ to 660cm⁻¹

80. The equation $E = E_0 + \frac{RT}{nF} \ln a_{M^{3+}}$ is used to measure

- (A) Conductance (B) Potential difference
(C) Resistance (D) Current

81. Camphor -- obtained from *Cinnamomum camphora*, is

- (A) optically neutral (B) Laevorotatory
(C) Dextrorotatory (D) Racemic mixture

82. Alkaloids exist in plants as

- (A) Salts of pyruvic acid (B) Salts of organic acids
(C) Esters of organic acids (D) Free bases

83. Codeine is
- (A) Acetyl ester of morphine (B) Dimethyl ether of morphine
(C) Methyl ether of morphine (D) Diethyl ether of morphine
84. In which of the following techniques the sample is kept below triple point?
- (A) Lyophilization (B) Spray drying
(C) Spray congealing (D) Centrifugation
85. Which one of the followings is used as a mood stabilizer for bipolar disorder and also in certain epileptic convulsions?
- (A) Phenytoin (B) Lithium
(C) Sodium valproate (D) Fluoxetine
86. Dianthrone is typically found in the species of
- (A) *Solenostemma* (B) *Coccus*
(C) *Andira* (D) *Rhamnus*
87. Which of the following is alkaloid rich family?
- (A) Lamiaceae (B) Apiaceae
(C) Liliaceae (D) Combretaceae
88. Cyclohexane can be used as a solvent in UV spectrophotometric analysis because
- (A) Energy requirement for $\sigma - \sigma^*$ is in the range of 120-200nm
(B) It has a ring structure
(C) It is volatile
(D) It is immiscible with water
89. An inorganic ion used prophylactically in bipolar depression is
- (A) Valproate (B) Lithium
(C) Chromium (D) Valium

90. The drug which increases the plasma concentration of digoxin by a pharmacokinetic mechanism is

(A) Lidocaine

(B) Captopril

(C) Quinidine

(D) hydrochlorthiazide