



GATE- 1988-2009, GPAT- 2010-2026

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PREVIOUS YEAR PAPER

FEATURES

Based on Latest GPAT Syllabus

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GPAT EXAM FORMAT & QUESTION DISTRIBUTION

A thorough understanding of the GPAT-2026 exam pattern is essential for aspirants aiming to excel. The exam, conducted by NBEMS, follows a structured pattern designed to evaluate candidates effectively. Familiarizing oneself with this pattern allows aspirants to plan their preparation systematically and stay on track for success.

GPAT EXAM PAPER PATTERN

Parameter	Exam Pattern
Exam Mode	Online Mode
Frequency	Once a year
Exam Duration	3 hours
Type of Questions	Multiple-choice questions
Total Number of Questions	125
Maximum Marks	500
Marking Scheme	4 marks for correct response; 1 mark deducted for wrong response

GPAT 2024 EXAM PAPER PATTERN ANALYSIS

Subjects	Total Questions	
	NBEMS Pattern	Questions Asked
Pharmaceutics and Allied Subject	38	32
Pharmacology and Allied Subject	28	41
Pharmaceutical Chemistry and Allied	38	31
Pharmacognosy and Allied Subject	10	10
Other Subjects of B.Pharm Course	11	11
Total	125	125

GPAT Syllabus

1. PHYSICAL CHEMISTRY

- Composition and Physical States of Matter
- Colligative Properties
- Thermodynamics
- Chemical Equilibria
- Phase Rule
- Refractive Index
- Solutions
- Electrochemistry
- Ionic Equilibrium
- Kinetics

2. PHYSICAL PHARMACY

- Matter and Properties of Matter
- Micromeritics and Powder Rheology
- Surface and Interfacial Phenomena
- Viscosity and Rheology
- Dispersion Systems
- Complexation
- Buffers
- Solubility

3. ORGANIC CHEMISTRY

- General Principles
- Different Classes of Compounds
- Protection and Deprotection of Groups
- Aromaticity & aromatic chemistry
- Different aromatic classes of compounds
- Polycyclic Aromatic Hydrocarbons
- Carbonyl Chemistry

- Heterocyclic Chemistry
- Bridged Rings
- Kinetic and Thermodynamic Control
- Stereochemistry
- Carbohydrates
- Amino Acids and Proteins
- Organometallic Chemistry
- Pericyclic Reactions

4. PHARMACEUTICAL CHEMISTRY

- Pharmaceutical Impurities
- Monographs
- Isotopes
- Therapeutic Classes of Drugs
- Drug Metabolism
- Various classes of Therapeutic Agents
- Different classes of therapeutic drugs

5. PHARMACEUTICS

- Pharmacy Profession
- Pharmaceuticals and Dosage Forms
- Routes of Administration
- ADME (Absorption, Distribution, Metabolism, Elimination)
- Sources of Drug Information
- Allopathic dosage form
- Crude extract
- Allergenic extract
- Ayurvedic system of medicine
- Homeopathic system of medicine
- Biological Products

GPAT Syllabus

- GMP
- Pharmaceutical Plant, location, layout
- Dosage Form Necessities and Additives
- Powders
- Capsules
- Tablets
- Parenterals - product requiring sterile packaging
- Suspensions
- Emulsions
- Suppositories
- Semisolids
- Liquids (solutions, syrups, elixirs, spirits, aromatic water, liquid for external uses)
- Pharmaceutical Aerosols
- Ophthalmic preparations
- Preformulations
- Radio Pharmaceuticals
- Stability of formulated products
- Kinetic Principles and Stability Testing
- Prolonged Action Pharmaceuticals
- Novel Drug delivery system
- Cosmetics
- Packaging Materials
- GMP and Validation
- Pilot plant scale up techniques

6. PHARMACOLOGY

- General Pharmacology
- Pharmacology of peripheral nervous system
- Pharmacology of cardiovascular System Drugs

- Drugs acting on urinary system
- Drugs acting on Respiratory system
- Pharmacology of central nervous System
- Pharmacology of Endocrine system
- Chemotherapy
- Autacoids and their Antagonists
- Pharmacology of drug acting on the gastrointestinal tract
- Chronopharmacology
- Immunopharmacology
- Chemotherapy of Malignant Diseases
- Peptides and proteins as mediators
- Nitric oxide
- Vitamins and Minerals
- Principles of toxicology

7. PHARMACOGNOSY

- Introductory Pharmacognosy
- Classification of Crude Drugs
- Sources of Crude Drugs
- Factors Influencing Quality of Crude Drugs
- Techniques in Microscopy
- Introduction to Phytoconstituents
- Principles of Plant Classification
- Pharmaceutical Aids
- Animal Products
- Plant Products
- Toxic Drugs
- Enzymes
- Natural Pesticides and Insecticides
- Adulteration and Evaluation of Crude Drugs

GPAT Syllabus

- Quantitative Microscopy
- Biogenetic Pathways
- Carbohydrates and Lipids
- Tannins
- Volatile Oils
- Resinous Drugs
- Glycosides
- Alkaloids
- Herbarium
- Extraction and Isolation Techniques
- Phytopharmaceuticals
- Quality Control and Standardization of Herbal Drugs
- Herbal Formulations
- Worldwide Trade of Crude Drugs and Volatile Oils
- Plant Biotechnology
- Herbal Cosmetics
- Traditional Herbal Drugs
- Plants-Based Industries and Research Institutes in India

8. PHARMACEUTICAL ANALYSIS

- Importance of quality control in pharmacy
- Acid-Base Titrations
- Non-Aqueous Titrations
- Oxidation-Reduction Titrations
- Precipitation Titrations
- Complexometric Titrations
- Gravimetry
- Extraction techniques

- Drugs acting on urinary system
- Miscellaneous methods of analysis
- Calibration
- General principles of spectroscopy
- UV-Visible Spectroscopy
- Spectrofluorimetry
- Flame photometry & atomic absorption spectrometry
- Infrared (IR) Spectroscopy
- Proton Nuclear Magnetic Resonance (NMR) Spectroscopy
- Mass Spectrometry
- Polarography
- Nephelometry & Turbidimetry
- Chromatography
- Miscellaneous

9. BIOCHEMISTRY

- Cell
- Carbohydrates
- Proteins
- Lipids
- Vitamins
- Biological oxidations & reductions
- Enzymes
- Nucleic Acids
- Hereditary diseases

10. BIOTECHNOLOGY

- Plant Cell and Tissue Culture
- Animal Cell Culture
- Fermentation Technology and Industrial Microbiology

GPAT Syllabus

- Recombinant DNA Technology
- Process and Applications
- Biotechnology Derived Products

• Proteomics

• Formulation of Proteins and Peptides

II. MICROBIOLOGY

- Introduction to Microbiology
- Microscopy and Staining Technique
- Biology of Microorganisms
- Fungi and Viruses
- Aseptic Technique
- Sterilization and Disinfection
- Microbial Spoilage
- Immunology and Health
- Vaccines and Sera
- Microbial Assay

12. PATHOPHYSIOLOGY

- Basic Principles of Cell Injury and Adaptation
- Basic Mechanisms of Inflammation and Repair
- Hypersensitivity
- Auto-Immunity and Diseases of Immunity
- Neoplastic Diseases
- Shock
- Protein-Calorie Malnutrition, Vitamins, Obesity, and Starvation
- Biological Effects of Radiation
- Pathophysiology of Common Diseases
- Infectious Diseases

13. BIOPHARMACEUTICS AND PHARMACOKINETICS

- Biopharmaceutics
- Bioavailability and Bioequivalence
- Biopharmaceutical Statistics

14. CLINICAL PHARMACY AND THERAPEUTICS

- Clinical Pharmacy Principles
- Clinical Trials
- Therapeutic Drug Monitoring
- Pharmacovigilance
- Therapy for Systemic and Neurological Disorders
- Therapy for Infectious and Endocrine Disorders
- Therapy for Malignant and Skin Disorders

15. ANATOMY, PHYSIOLOGY AND HEALTH EDUCATION

- Cell Physiology
- The Blood
- Gastrointestinal Tract
- Respiratory System
- Autonomic Nervous System
- Sense Organs
- Skeletal System
- Central Nervous System
- Urinary System
- Endocrine Glands
- Reproductive System
- Cardiovascular System
- Lymphatic System

GPAT Syllabus

16. PHARMACEUTICAL ENGINEERING

- Fluid Flow
- Heat Transfer
- Evaporation
- Distillation
- Drying
- Size Reduction and Size Separation
- Extraction
- Mixing
- Crystallization
- Filtration and Centrifugation
- Dehumidification and Humidity Control
- Refrigeration and Air Conditioning
- Material of Construction
- Automated Process Control Systems
- Industrial Hazards and Safety Precautions

17. PHARMACEUTICAL MANAGEMENT

- Introduction to Management
- Planning and Forecasting
- Organization
- Research Management
- Inventory Management
- Communication
- Marketing Research
- Leadership and Motivation
- Human Resource and Development (HRD)
- GATT
- World Trade Organization (WTO) and Trade Related Intellectual Property Rights (TRIPS)

- Standard Institutions and Regulatory Authorities

18. PHARMACEUTICAL JURISPRUDENCE

- Pharmacy Act, 1948
- Drugs and Cosmetics Act, 1940
- Narcotic Drugs and Psychotropic Substances Act
- Drugs and Magic Remedies Act, 1954
- Medicinal and Toilet Preparations Act, 1955
- Medical Termination of Pregnancy Act, 1970
- Consumer Protection Act
- Intellectual Property Rights

19. DISPENSING & HOSPITAL PHARMACY

- Laboratory Equipment and Prescription Handling
- Percolation Process Preparations
- Maceration Process Preparations
- Marketed vs. Dispensed Products
- Posological Calculations
- Allegation, Dilution, and Isotonic Preparations
- Patent and Generic Products Study
- Compounding and Dispensing
- Prescription Reading and Counseling
- Mock Pharmacy Design



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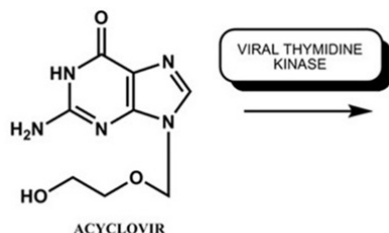
SCAN TO FOLLOW US



GPAT-2026

Section-A

1. Identify the active metabolite of acyclovir which binds DNA polymerase. Also, mention the type of chemical reaction involved in its metabolism:



- (a) Acyclovir triphosphate; phosphorylation
(b) Acyclovir diphosphate; phosphorylation
(c) Acyclovir thymidyl trihydroxylate; hydroxylation
(d) Acyclovir thymidyl hydroxylate; hydroxylation
2. If emission intensity doubles when concentration increases from 5 to 10 ppm, the relationship obeyed is:
(a) Exponential relationship (b) Linear proportionality
(c) Beer–Lambert law (d) Inverse proportionality
3. The quinoline containing local anaesthetic is:
(a) Dibucaine (b) Benzocaine
(c) Tetracaine (d) Prilocaine
4. The mechanism of action of acarbose is:
(a) α -glucosidase inhibition
(b) β -glucosidase inhibition
(c) α -glucosidase inhibition
(d) β -glucosidase inhibition
5. Which buffer system is most commonly used in ophthalmic preparations?
(a) Phosphate buffer (b) Acetate buffer
(c) Citrate buffer (d) Lactate buffer
6. During ampoule sealing, nitrogen flushing is used mainly to:
(a) Sterilize the product (b) Improve clarity
(c) Reduce oxidation of drug (d) Increase filling speed
7. Ginkgo biloba should be avoided with:
(a) Anticoagulants (b) Antihistamines
(c) Antidiabetics (d) Antacids
8. McCabe–Thiele method is primarily used to determine:
(a) Vapour pressure of component
(b) Number of theoretical plates in distillation
(c) Column diameter in distillation
(d) Heat duty of reboiler
9. Indicator used in EDTA titration of calcium and magnesium is:
(a) Methyl Orange (b) Starch
(c) Eriochrome Black T (d) Phenolphthalein
10. In-process tablet thickness variation is mainly influenced by:
(a) Compression force (b) Die diameter
(c) Lubricant concentration (d) Granule flow rate
11. The quantitative values determined for the identification of leaf drugs remain constant “throughout the life of the plant” EXCEPT: (Claimed Question)
(a) Vein-islet number (b) Stomatal number
(c) Stomatal index (d) Veinlet termination number
12. Naphthalene is best purified by which process:
(a) Steam distillation (b) Sublimation
(c) Crystallization (d) Distillation
13. WHO recommends the use of chromatographic techniques in herbal medicines mainly for:
(a) Fingerprint profiling
(b) Detection of moisture content
(c) Detection of microbial load
(d) Packaging analysis
14. Iodine is very sparingly soluble in water, that is about 1 part of iodine in _____ parts of water:
(a) 100 (b) 4000 (c) 400 (d) 1000
15. If the pKa of phenobarbitone is 3.4, what fraction of drug would be ionized at pH 4.4?
(a) 0.90 (b) 0.50 (c) 1.00 (d) 0.01
16. Presence of electron-withdrawing groups on the phenothiazine ring enhances antipsychotic activity by:
(a) Reducing CNS penetration
(b) Reducing hepatic metabolism
(c) Increasing water solubility
(d) Increasing dopamine receptor binding
17. In tube-dilution test for bactericidal agents, stainless steel cylinders are inoculated with test organism and exposed for:
(a) Zone of inhibition
(b) Colony count reduction
(c) Minimum bactericidal concentration
(d) Time-kill curve
18. In the light chain of immunoglobulin, the carboxy terminal half of the molecule i.e., Constant (C) region consists of two basic amino acid sequences named as:
(a) Beta (β) and Gamma (γ)
(b) Alpha (α) and Beta (β)
(c) Kappa (κ) and Lambda (λ)
(d) Delta (δ) and Theta (θ)
19. Among the gaseous substances used for sterilization/disinfection, which of the following is not suitable for fumigation of rooms because of its explosive property?
(a) Chlorine dioxide (b) Beta propiolactone
(c) Formaldehyde (d) Ethylene oxide

59. The number of asymmetric centers in oxytetracycline is:
(a) 6 (b) 5 (c) 7 (d) 4
60. Children with severe acute malnutrition (SAM) aged between six months and fifty-nine months can be identified by measuring their mid-upper-arm circumference (MUAC). A child with SAM has a MUAC measurement of:
(a) Less than 15.5 cm (b) Less than 12.5 cm
(c) Less than 14.5 cm (d) Less than 13.5 cm
61. Of the four asymmetric centers in quinine, the absolute configuration around C-8 and C-9 is:
(a) 8S, 9R (b) 8S, 9S (c) 8R, 9R (d) 8R, 9S
62. Select the correct statement about the mechanism of action of Quinidine and Procainamide as an antiarrhythmic drug:
(a) They are muscarinic blockers
(b) Blocks L-type Ca^{2+} channels
(c) Blocks Na^+ channels present in open state
(d) Blocks inactivated Na^+ channels
63. For the priorities of surveillance, the National Programme for Control and Treatment of Occupational Diseases includes the following:
(a) Burnout syndrome
(b) Traffic-related injuries from commuting
(c) Musculoskeletal disorders related to prolonged use of computers
(d) Silicosis
64. Which type of necrosis is typically associated with bacterial infections and pus formation:
(a) Caseous necrosis (b) Coagulative necrosis
(c) Liquefactive necrosis (d) Fat necrosis
65. The maximum volume of air contained in the lung by a full forced inhalation is called:
(a) Tidal volume (b) Total lung capacity
(c) Inspiratory capacity (d) Vital capacity
66. Which of the following is a vector index used for the quantitative assessment of malaria transmission:
(a) Human blood index
(b) Annual blood examination rate
(c) Annual parasite incidence
(d) Slide positivity rate
67. U-PHC is meant for a population of around:
(a) 5,00,000 (b) 10,000
(c) 2,50,000 (d) 50,000
68. Which drug can be given by intravenous route for paroxysmal supraventricular tachycardia:
(a) Prazosin (b) Dobutamine
(c) Nifedipine (d) Adenosine
69. Which of the following vaccines is indicated for prevention of pneumonia infection:
(a) BCG vaccine (b) Dukoral vaccine
(c) Hib vaccine (d) Rotavirus vaccine
70. The receptor on human epithelial cells to which *Neisseria gonorrhoeae pili* bind is:
(a) CD14 (b) CD4 (c) CD46 (d) CD55
71. Which document specifies stepwise methods to perform routine operations and ensure consistency:
(a) Standard Operating Procedure (SOP)
(b) Master batch record
(c) Training matrix
(d) Quality manual
72. Cyproheptadine increases appetite mainly via antagonism of which receptors:
(a) Muscarinic M_3 receptors
(b) 5-HT₂ serotonin receptors
(c) Beta-adrenergic receptors
(d) Dopamine D_2 receptors
73. Phosphate buffer consists of ____ as an acidic member:
(a) Disodium hydrogen phosphate
(b) Sodium dihydrogen phosphate
(c) Disodium dihydrogen phosphate
(d) Sodium hydrogen phosphate
74. Which of the following is a rapid acting insulin preparation/analogue:
(a) Insulin detemir (b) Insulin glulisine
(c) Insulin regular (d) Human NPH
75. Nalidixic acid, a synthetic antibacterial agent, belongs to which of the following class of heterocyclic chemical group:
(a) Naphthyridine-4-one
(b) Pyrrolopyrimidine-3-one
(c) Quinoline-4-one
(d) Quinoline-3-one

Section – D

76. The theory of filtration is explained by:
(a) Stefan-Boltzmann equation
(b) Darcy's equation
(c) Stoke's equation
(d) Dalton's equation
77. NRDC is described as an agency promoting commercialization of technologies from public to private sectors. Which of the following best reflects its functional role:
(a) Monitoring import/export of pharmaceuticals
(b) Facilitating transfer of inventions, patents and processes
(c) Regulating GMP for pharmaceutical plants
(d) Issuing licenses for drug manufacturing
78. A benzodiazepine lacking an electron-withdrawing group at C-7 shows reduced anxiolytic activity due to:
(a) Enhanced hepatic metabolism
(b) Reduced GABA-A receptor affinity
(c) Increased plasma protein binding
(d) Reduced oral bioavailability
79. Calculate the wave number of stretching vibration of a carbon-carbon double bond.
($k = 10 \times 10^5 \text{ dynes cm}^{-1}$)
(a) 1820 cm^{-1}
(b) 1537 cm^{-1}
(c) 1762 cm^{-1}
(d) 1680 cm^{-1}

GPAT-2025

Section-A

1. Which technique is employed for the location of radioactive isotopes in biological and other materials by using X-ray sensitive film:

- (a) Liquid Scintillation Counter
(b) Sequential analysis
(c) Precursor-product sequence
(d) Autoradiograph

2. Pyridine is a base with K_b equal to:

- (a) 3.2×10^{-6} (b) 3.8×10^{-7}
(c) 2.3×10^{-9} (d) 1.7×10^{-12}

3. Which is an example of continuous shelf moving bed dryer:

- (a) Vacuum Tumble Dryer (b) Turbo Tray Dryer
(c) Tray Dryer (d) Spray Dryer

4. Match the following with the type of causative agents:

Disease	Causative agents
P. Tuberculosis	i. Bacteria
Q. Diphtheria	ii. Viral
R. Yellow fever	iii. Toxoid
S. Malaria	iv. Protozoa

- (a) P(i), Q(iii), R(ii), S(iv) (b) P(i), Q(ii), R(iii), S(iv)
(c) P(ii), Q(iii), R(iv), S(i) (d) P(iv), Q(iii), R(ii), S(i)

5. Total number of stereoisomers for 3-bromo-2-butanol is:

- (a) 2 (b) 4 (c) 6 (d) 8

6. Cis-trans (Z/E) isomerism is exhibited by all except:

- (a) 4-chloro-2-pentene (b) 1-butene
(c) 2-chloro-3-hexene (d) 2-butene-1-ol

7. In supercritical fluid extraction, critical temperature (tc) and critical pressure (pc) for CO₂ are:

- (a) 31°C and 54 atm (b) 51°C and 74 atm
(c) 51°C and 54 atm (d) 31°C and 74 atm

8. Trikatu in Ayurveda is the combination of:

- (a) Black mustard, long pepper and ginger
(b) Black pepper, small pepper and ginger
(c) Black pepper, long pepper and betel
(d) Black pepper, long pepper and ginger

9. Molecules in the smectic liquid crystals are characterized by which one of the following:

- (a) Mobility in two directions and no rotation
(b) Mobility in three directions and rotation in one axis
(c) Mobility in three directions and no rotation
(d) Mobility in two directions and rotation in one axis

10. Arrange the following alkenes in order of its stability:

- (a) Trans-2-butene > cis-2-butene > isobutene > but-1-ene
(b) Cis-2-butene > trans-2-butene > but-1-ene > isobutene
(c) Trans-2-butene > isobutene > cis-2-butene > but-1-ene
(d) Isobutene > trans-2-butene > cis-2-butene > but-1-ene

11. Which of the following is the correctly matched pair:

Parameter	Method
P. True density	(i) Reciprocal of bulk density
Q. Granule density	(ii) Graduated cylinder method
R. Bulk density	(iii) Helium pycnometer
S. Bulkiness	(iv) Mercury displacement method

- (a) P(i), Q(ii), R(iii), S(iv) (b) P(iii), Q(iv), R(ii), S(i)
(c) P(iii), Q(ii), R(iv), S(i) (d) P(i), Q(ii), R(iv), S(iii)

12. Which of the following diluent is incompatible with primary amines:

- (a) Mannitol (b) Dextrose
(c) Microcrystalline Cellulose (d) Lactose

13. When the highest dose of a drug is soluble in 250 ml or less of an aqueous medium over the pH range from 1 to 6.8 at 37°C and the extent of absorption in humans is expected to be more than or equal to 85 % of the administered dose, the drug is said to be classified in which of the BCS Class:

- (a) Class I (b) Class III (c) Class II (d) Class IV

14. Identify the naturally occurring pilocarpine:

- (a) 2S,5R-(+)-pilocarpine (b) 2R,4R-(-)-pilocarpine
(c) 3R,4S-(-)-pilocarpine (d) 3S,4R-(+)-pilocarpine

15. Which among the following is a class-II methods for tonicity adjustment:

- (a) Sodium chloride equivalent method
(b) Molecular concentration method
(c) White Vincent method
(d) Cryoscopic method

16. Benzene undergoes Friedel-Crafts reaction with isopropyl bromide in the presence of anhydrous aluminum chloride catalyst to give:

- (a) Acetophenone (b) n-Propylbenzene
(c) Isopropylbenzene (d) Benzophenone

17. Match pair of drug with its family:

Column A	Column B
a) Snake Root	i) Compositae
b) Artemisia	ii) Rosaceae
c) Bitter Almond	iii) Apocyanaceae
d) Myrrh	iv) Burseraceae

56. In A/B trans ring junction of steroid, hydrogen atom at 5th position has:

- (a) Alpha configuration (b) Eclipsed conformation
(c) Gauche conformation (d) Beta configuration

57. Which of the following is a peroxisome proliferator-activated receptor gamma agonist:

- (a) Sulphonyl ureas (b) Metformin
(c) Pioglitazone (d) Acarbose

58. Match the following:

Class	Antiarrhythmic drugs
1. Class I	a. Disopyramide
2. Class-II	b. Metoprolol
3. Class-III	c. Amiodarone
4. Class-IV	d. Verapamil

- (a) 1-d, 2-b, 3-c, 4-a (b) 1-d, 2-c, 3-b, 4-a
(c) 1-a, 2-b, 3-c, 4-d (d) 1-a, 2-c, 3-b, 4-d

59. Which one of the following antiplatelet drug acts by P2Y12 receptor antagonism:

- (a) Dipyridamol (b) Tirofiban
(c) Clopidogrel (d) Aspirin

60. The cyanide ions can be determined by Nephelo-Turbidimetry as salt of cyanide with:

- (a) Silver (Ag) (b) Gold (Au)
(c) Sodium (Na) (d) Potassium (K)

61. The number of carbon present in Pregnane is:

- (a) 27 (b) 18 (c) 19 (d) 21

62. Albinism is due to complete or partial absence of the following enzyme:

- (a) Hydroxylase (b) Tyrosinase
(c) β hydroxylase (d) Pyruvase

63. Match the following:

Class	Drug
1. Alkylating agent	a. Mechlorethamine
2. Platinum analog	b. Cisplatin
3. Antimetabolite	c. 5-Fluorouracil
4. Growth factor receptor inhibitor	d. Cetuximab

- (a) 1-b, 2-a, 3-c, 4-d (b) 1-a, 2-b, 3-d, 4-c
(c) 1-b, 2-a, 3-d, 4-c (d) 1-a, 2-b, 3-c, 4-d

64. Which of the following will be most easily diazotised:

- (a) P-Nitro aniline (b) P-Chloroaniline
(c) Aniline (d) P-Bromo aniline

65. Mirabegron is primarily used in the treatment of over-active bladder. It is well known as:

- (a) β 2-selective adrenergic receptor agonist
(b) β 3-selective adrenergic receptor agonist
(c) Non-selective α -blocker
(d) Selective M3 receptor antagonist

66. Which of the following is not a part of the Karl Fischer reagent:

- (a) Sulfur dioxide (b) Pyridine
(c) Pyrimidine (d) Iodine

67. Arrange the following steps in the correct order as they occur in the drug discovery process:

1. Lead Optimisation 2. Target Selection
3. Lead Finding

- (a) 2 -> 1 -> 3 (b) 2 -> 3 -> 1
(c) 3 -> 1 -> 2 (d) 1 -> 2 -> 3

68. Which parasitic worm is responsible for causing lymphatic filariasis:

- (a) Necator americanus (b) Onchocerca volvulus
(c) Ancylostoma duodenale (d) Brugia malay

69. Oral vaccines such as Dukoral® and Shanchol™, provide protection against:

- (a) Ebola virus (b) Pneumonia
(c) Cholera (d) Polio

70. Methotrexate is the classic antimetabolite of folic acid structurally derived by Nmethylation of the para-amino benzoic acid residue (PABA) and replacement of a pteridine hydroxyl by the following bioisosteric group:

- (a) SH (b) CF (c) CH3 (d) NH2

71. A structural hybrid of Meperidine and Methadone is:

- (a) Lofentanil (b) Pentazocine
(c) Loperamide (d) Diphenoxylate

72. Which of the following statement(s) is/are correct regarding Salt bridge used in potentiometric titrations:

- I. Prevents possible contamination of the reference electrodes with the test solutions
II. Not designed as part of reference electrode
III. Has no effect on liquid junction potential
IV. Mostly solidified with 3% agar

- (a) I & IV (b) III & IV (c) I only (d) I & III

73. Match the following:

Pancreatic islet cells	Secretory Product
1. Alpha (α) cell	a. Glucagon
2. Beta (β) cell	b. Somatostatin
3. Delta (δ) cell	c. Gastrin
4. G cell	d. Proinsulin

- (a) 1-d, 2-a, 3-c, 4-b (b) 1-a, 2-d, 3-c, 4-b
(c) 1-a, 2-b, 3-c, 4-d (d) 1-a, 2-d, 3-b, 4-c

74. Select the proper sequence from start of contraction regarding skeletal muscle contraction:

- A. Release of calcium from sarcoplasmic reticulum after change in potential
B. Stimulation of motor end plate with acetylcholine
C. Troponin binds with calcium causing expose of binding sites for myosin
D. Actin and myosin crossbridge leads to power stroke
(a) ABCD (b) BACD (c) BCAD (d) BCDA

- 116. Which one of the following diseases is caused by the deficiency of niacin**
 (a) Anemia (b) Pellagra
 (c) Scurvy (d) Night Blindness
- 117. Which of the following is the best technique for detecting HIV**
 (a) Real-time PCR
 (b) Widal test
 (c) Reverse transcriptase-PCR
 (d) Polymerase chain reaction
- 118. Histogram can be drawn only for**
 (a) Continuous frequency distribution
 (b) Discrete frequency distribution
 (c) Cumulative frequency distribution
 (d) Relative frequency distribution
- 119. If one event is unaffected by the outcome of another event, the two events are said to be**
 (a) Either dependent or independent
 (b) Dependent
 (c) Independent
 (d) Mutually exclusive
- 120. A hypothesis stipulating that there is no difference between the situations, groups and outcomes called**
 (a) Null hypothesis
 (b) Hypothesis of association
 (c) Hypothesis of differences
 (d) Alternative hypothesis
- 121. Aerobic dehydrogenase in biological oxidation contains**
 (a) NADP (b) NAD
 (c) FMN & FAD (d) NADH
- 122. Influenza viruses are RNA viruses and belong to which family**
 (a) Orthomyxoviridae (b) Papoviridae
 (c) Retroviridae (d) Parvoviridae
- 123. Which of the following is a causative organism for Syphilis**
 (a) Clostridium tetani (b) Bacillus pertussis
 (c) Treponema pallidum (d) Vibrio cholerae
- 124. The optimum temperature for rapid growth of mesophiles is**
 (a) 40 to 50°C (b) 50 to 60°C
 (c) 25 to 40°C (d) 15 to 20°C
- 125. Virus mediated transfer of host DNA from one cell to another cell is known as**
 (a) Transcription (b) Integration
 (c) Transduction (d) Transformation

Answer Key

1-c	2-c	3-b	4-c	5-a	6-d	7-d	8-d	9-a	10-b
11-a	12-*	13-a	14-d	15-c	16-c	17-c	18-d	19-c	20-a
21-c	22-c	23-a	24-d	25-b	26-*	27-d	28-b	29-d	30-a
31-b	32-d	33-d	34-d	35-b	36-b	37-d	38-c	39-b	40-a
41-c	42-a	43-c	44-a	45-c	46-b	47-*	48-c	49-c	50-c
51-d	52-a	53-a	54-a	55-b	56-c & d	57-a	58-a	59-b	60-a
61-d	62-b	63-d	64-d	65-b	66-a	67-a	68-c	69-d	70-d
71-b	72-c	73-b	74-a	75-a	76-a	77-a	78-c	79-d	80-b
81-d	82-d	83-d	84-b	85-b	86-c	87-d	88-b	89-c	90-b
91-c	92-b	93-a	94-c	95-d	96-d	97-c	98-b	99-d	100-d
101-b	102-b	103-c	104-b	105-c	106-d	107-b	108-c	109-a	110-c
111-c	112-a	113-b	114-c	115-c	116-b	117-c	118-a	119-c	120-a
121-c	122-a	123-c	124-c	125-c					

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SHIFT-I

Pharmaceutics

- Which of the following terms is used to describe the "Partial or complete separation of the top or body crowns of a tablet from the main body of the tablet"?
(a) Lamination (b) Capping
(c) Picking (d) Mottling
- The law of relative lowering of vapour pressure was given by
(a) Raoult (b) Ostwald
(c) Henry (d) Van't Hoff
- Dipole-dipole weak interactions are also called as
(a) London forces (b) Debye interactions
(c) Electrovalent forces (d) Keesom forces
- Invert sugar is a product obtained by the hydrolysis of
(a) Maltose (b) Sucrose (c) Lactose (d) Dextrin
- The time taken at a fixed temperature or the radiation dose required to achieve a 90% reduction in viable bacterial cells is called
(a) F value (b) Z value (c) D value (d) T value
- In pharmacokinetic models, the term "Compartment" means
(a) Blood (b) Individual organ
(c) Extracellular fluid (d) Hypothetical pool of tissue
- The most efficient heat exchange between the particles and flowing air occurs in the
(a) Tray dryer (b) Vacuum Dryer
(c) Fluidized bed dryer (d) Rotary dryer
- The Drug Price Control Order (DPCO) is an order issued by the Government under the _____ which enables it to fix the prices of some essential bulk and their formulations
(a) Essential Commodities Act
(b) Essential Commodities Amendment
(c) Essential Commodities Accessories
(d) Ethical Commodities Act
- According to IP and BP, very fine powder is one in which
(a) All particles pass through 120# sieve
(b) 90% particles pass through 350# sieve
(c) All particles pass through 350# sieve
(d) 90% particles are of size < 10 μm
- Which of the following pharmaceutical solvent has the highest dielectric constant, at 25 degree C
(a) Glycerin (b) Ethanol (c) Acetone (d) Phenol
- Kozeny Carman equation is used to determine the
(a) Surface area of the powder (b) Viscosity of a liquid
(c) Surface tension of a liquid (d) Density of a liquid
- Which of the following emulsifiers has the highest HLB value
(a) Span 80 (b) Acacia
(c) Tween 80 (d) Sodium lauryl sulfate
- Which of the following substances are not used as humectants in emulsions?
(a) Propylene glycol (b) Sorbitol
(c) Tocopherol (d) Glycerol
- Under which of the following conditions in-vitro-in-vivo correlation for a drug fails
(a) When the drug is highly soluble
(b) When the drug's absorption takes place by a complex process
(c) When the dissolution medium is adequately simulated
(d) When the drug is highly permeable but poorly soluble
- A crystalline powder that contains water of crystallization or hydration; this water can be liberated either during manipulations or on exposure to a low-humidity environment then the powder will become sticky and pasty, or it may even liquefy. Such a powder is called
(a) Eutectic (b) Hygroscopic
(c) Deliquescent (d) Efflorescent
- The formula to calculate liquid pressure is
(a) $P = mgh$ (b) $P = wgh$ (c) $P = \rho gh$ (d) $P = Fgh$
- Out of the following solvents which one is not a polar solvent
(a) Ethanol (b) Methanol (c) Hexane (d) Water
- Which of the following molecular properties can be determined by Thermogravimetric Analysis
(a) Solubility (b) Hygroscopicity
(c) Colour stability (d) Hydrolysis
- Which of the following levels of IVIVC is represented by "the relationship between one dissolution time point (e.g. $t_{50\%}$) and one mean pharmacokinetic parameter, such as AUC, T_{\max} or C_{\max} "
(a) Level A (b) Level B
(c) Level C (d) Level D
- Which of the following USP Glass Types is NOT SUITABLE for parenteral packaging
(a) Type I (b) Type II (c) Type III (d) Type IV
- The difference in velocity between two planes of liquids separated/infinitesimal distance is called
(a) Rate of shear (b) Rate of flow
(c) Rate of force (d) Shearing stress
- The required amount of adjusting substance required to make a hypotonic solution, isotonic is given by the (Where, W = Adjusting substance, a = Freezing point depression of unadjusted solution and b = Freezing point depression of water)

71. The molecule having zero dipole moment is
 (a) BF_3 (b) HF (c) NH_3 (d) CH_3Cl

Pharmacology

72. Following is an example of atypical anti-psychotic
 (a) Haloperidol (b) Clozapine
 (c) Thioridazine (d) Fluphenazine
73. Following is NOT an example of Carbapenem
 (a) Thienamycin (b) Imipenem 70
 (c) Piperacillin (d) Meropenem
74. Which of the following Urinary Tract Anti-Infective agents requires an acidic pH of urine for optimum action
 (a) Gentamicin (b) Erythromycin
 (c) Carbenicillin (d) Streptomycin
75. *Which of the following drugs has an apparent volume of distribution approximately 6500 L
[DROPPED QUESTION]
 (a) Amoxicillin (b) Ibuprofen
 (c) Chloroquine (d) Diazepam

76. Match the following concept in List I with parameters in List II

S. No.	Concept (List I)	Parameter Code (List II)	Explanation
1	Volume of distribution	S	Ratio of body drug content to plasma concentration
2	Evans blue	Q	Binds to Human serum albumin / Measure volume of plasma
3	3.5-5%	R	Volume of blood
4	Metallothionein	S	Ratio of body drug content to plasma concentration
		T	Protein present in kidney to bind metal

Choose the CORRECT answer from the options given below

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[Q], 2-[P], 3-[R], 4-[S]
 (c) 1-[S], 2-[P], 3-[Q], 4-[T]
 (d) 1-[P], 2-[R], 3-[Q], 4-[S]
77. Trastuzumab is a/an
 (a) EGFR/HER, inhibitor
 (b) Angiogenesis inhibitor
 (c) EGF receptor (HER,) inhibitor
 (d) BCR-ABL tyrosine kinase inhibitor
78. When is a New Drug Application (NDA) made
 (a) A drug meant to be distributed among the orphans who cannot afford the cost of the drug
 (b) A drug for a disease which is not having any other treatment options at all
 (c) A drug which is useful for rare disease
 (d) A drug that is available in abundance
79. Identify the drug that is NOT among the drugs recommended as first-time drug in the treatment of Partial seizures with or without generalization

- (a) Carbamazepine (b) Valproate
 (c) Diazepam (d) Lamotrigine

80. Which of the following hyperlipidemic drugs act via a GPCR?

- (a) Nicotinic acid (b) Fenofibrate
 (c) Atorvastatin (d) Ezetimibe

81. All the following are TNF- α Inhibitors EXCEPT

- (a) Etanercept (b) Infliximab
 (c) Adalimumab (d) Basiliximab

82. Match the following cells of immune system List I with their functions List I

S. No.	List I Immune System	List II Functions
1	Mast cell	P Allergic reactions
2	Lymphocytes	Q Allergic reactions
3	T-cells	R Cell mediated immune reaction
4	Monocytes-Macrophages	S Antigen recognition, Phagocytosis

Choose the CORRECT answer from the options given below

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[Q], 2-[P], 3-[R], 4-[S]
 (c) 1-[R], 2-[P], 3-[Q], 4-[S]
 (d) 1-[P], 2-[R], 3-[Q], 4-[S]

83. Which of the following drug can produce mydriasis without cycloplegia

- (a) Atropine (b) Tropicamide
 (c) Homatropine (d) Ephedrine

84. What do you mean by Orphan drug

- (a) A drug meant to be distributed among the orphans who cannot afford the cost of the drug
 (b) A drug for a disease which is not having any other treatment options at all
 (c) A drug which is useful for rare disease
 (d) A drug that is available in abundance

85. Normal value of HbA1c in the range of Tanul

- (a) 0.1% to 0.8% (b) 6.5% to 7.5%
 (c) 21.5% to 24.5% (d) 51.5% to 53.5%

86. A 70 kg woman was administered 1000 mg of the drug as i.e bolus. After its uniform distribution in the body, the plasma concentration of the drug was found to be 50 mg/L. What is its volume of distribution

- (a) 70L (b) 500L (c) 20L (d) 0.1L

87. A hypertensive patient receiving a drug 'Y' for managing BP was prescribed a tricyclic antidepressant. As a result, there was an abolition of the antihypertensive action of 'Y'.

Which of the following drugs could be 'Y'

- (a) Atenolol
 (b) Captopril
 (c) Clonidine
 (d) Diltiazem

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SHIFT-II

Pharmaceutics

- The addition of Monobasic Potassium Phosphate to the suspended Bismuth Subnitrate particles cause the A to B owing to the C**
 - A- negative zeta potential, B-decrease, C- adsorption of the negatively charged phosphate anion
 - A-positive zeta potential, B-increase, C- adsorption of the negatively charged phosphate anion
 - A-positive zeta potential, B-decrease, C- adsorption of the negatively charged phosphate anion
 - A- positive zeta potential, B-decrease, C- adsorption of the positively charged hydrogen anion
- Noyes-Whitney equation predicts**
 - An increase of dissolution rate if the particle size is reduced by micronization because of an increase in area
 - Relationship between the radius of the diffusing molecule and its diffusion coefficient
 - The influence of electrolyte on the rate constant
 - An equilibrium between the surfactant and the drug molecules at the surface of the solution and in the bulk of the solution
- Which type of in-vitro-in-vivo correlation compares % drug released Vs % drug absorbed**
 - Level C
 - Level A
 - Multiple level C
 - Level B
- Ideally BA studies should be carried on volunteers**
 - Aged
 - Children
 - Healthy
 - Patient
- Given below are two statements, one labelled as Assertion (A) and the other labelled as Reason (R)**
Assertion (A): In case of Salicylic Acid Ointment BP Wool Alcohol Ointment made with white soft paraffin is used
Reason (R): Wool Alcohol Ointment made with white soft paraffin is used because the medicament is coloured
In the light of the above statements, choose the most appropriate answer from the options given below
 - Both (A) and (R) are true and (R) is the correct explanation of (A)
 - Both (A) and (R) are true but (R) is not the correct explanation of (A)
 - (A) is true but (R) is false
 - (A) is false but (R) is true
- If S is the solubility of small particles of radius r, is the normal solubility (i.e., of a solid consisting of fairly large particles), is the interfacial energy, M is the molecular weight of the solid, ρ is the density of the bulk solid, R is the gas constant and T is the thermody-**

amic temperature, then which of the following equation indicates the changes in interfacial free energy that accompany the dissolution of particles of varying sizes causing the solubility of substance to increase with decreasing particle size

- $\log(S_0/S) = 2\gamma M_r / 2.303RT\rho$
- $\log(S/S_0) = 2\gamma M_r / 2.303RT\rho$
- $\log(S_0/S) = 2\gamma M / 2.303RT\rho$
- $\log(S/S_0) = 2\gamma M / 2.303RT\rho$

- Indicate which of the following molecular characteristics will be expected to increase the solubility of a simple solute in an aqueous solution**

- A high melting point
- The presence of polar group
- A high molecular surface area
- A high boiling point

- Match List I with List II**

	LIST- I Dissolution Apparatus		LIST-II NAME
1.	Type 1	[P]	Reciprocating holder
2.	Type 5	[Q]	Paddle over disk
3.	USP App 6	[R]	Basket type
4.	USP App 7	[S]	Cylinder apparatus

Choose the correct answer from the options given below

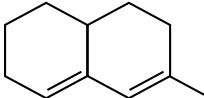
- 1-[R], 2-[Q], 3-[S], 4-[P]
- 1-[S], 2-[P], 3-[Q], 4-[R]
- 1-[Q], 2-[R], 3-[P], 4-[S]
- 1-[P], 2-[Q], 3-[R], 4-[S]

- A clear, sweetened hydroalcoholic liquid containing medicament is known as**

- Elixir
- Syrup
- Tincture
- Decoction

- Match List I with List II**

	List-I Name Of Emulsifier		List - II Remark
1.	Triethanolamine oleate	[P]	Surface active agent (non-ionic)
2.	N-cethyl N-ethyl morpholinium ethosulfate (Atlas G-263)	[Q]	Hydrophilic colloid
3.	Polyoxyethylene sorbitan mono oleate (Atlas Tween 80)	[R]	Surface- active agent (anionic)
4.	Gelatin	[S]	W/O Emulsifier (HLB= 4.3)
		[T]	Surface active agent (cationic)

65. When exposed to carbon monoxide, the base pigment of Cytochrome P enzymes absorb light at
 (a) 450 nm (b) 370 nm
 (c) 254 nm (d) 600 nm
66. In atomic absorption spectroscopy, back ground correction performed using a single hollow cathode lamp pulsed first with a low current and then with a high current is called
 (a) Smith Hieftje background correction
 (b) Continuous source background correction
 (c) Zeeman effect background correction
 (d) Hollow cathode background correction
67. Predict the theoretical max value for the following compound using Woodward-Fieser rules. Base value for the compound is 215 nm
- (a) 240 nm
 (b) 220 nm
 (c) 225 nm
 (d) 235 nm
- 
68. All the following about back titration are true, EXCEPT
 (a) It is performed when the rate of reaction between the analyte and reagent is fast
 (b) It is performed when the rate of reaction between the analyte and reagent is slow
 (c) It is performed when the standard solution lacks stability
 (d) It is the process in which excess of standard solution used to react with an analyte is determined by titration with a second standard solution
69. A chromatogram of a peak provided a retention time at 5.4 minutes and 0.41 base width of the peak. The number of plates or the peak obtained is
 (a) 210.7 (b) 173.5 (c) 78.4 (d) 2775.5
70. In UV spectrophotometer, lamp used to generate UV spectrum is
 (a) Tungsten (b) Sodium vapor
 (c) LED (d) Deuterium
71. Ostwald's dilution law is applicable to
 (a) Weak electrolytes (b) Strong electrolytes
 (c) Non-electrolytes (d) All electrolytes

Pharmacology

72. Following statement is correct with respect to voltage sensitive calcium channels
 (a) L-type Blocker: Nifedipine
 (b) T-type Blocker: Verapamil
 (c) N-type Blocker: Mibefradil
 (d) R-type Blocker: Diltiazem
73. One of the following drugs is not meant for systemic use
 (a) Netilmycin (b) Sisomicin
 (c) Neomycin (d) Paromomycin
74. Which among the following is not used as NSAID
 (a) Indomethacin extended release 75 mg
 (b) Aspirin 75 mg

- (c) Naproxen 500 mg
 (d) Mefenamic acid 500 mg
75. Fight or Flight responses are mediated by
 (a) Parasympathetic division of Autonomous nervous system
 (b) Sympathetic division of Autonomous nervous system
 (c) Serotonergic nervous system
 (d) Histaminergic nervous system
76. Which one of the following is an autosomal dominant syndrome in its inheritance
 (a) Gilbert's syndrome
 (b) Crigler-Najjar syndrome Type-I
 (c) Dubin- Johnson syndrome
 (d) Rotor syndrome
77. One of the following match is correct choose it
 (a) M₁ Acetylcholine receptors confined to brain M₂ Acetylcholine receptors neural M₃ Acetylcholine receptors are cardiac M₄ Acetylcholine receptors glandular
 (b) M₁ Acetylcholine receptors neural M₂ Acetylcholine receptors confined to brain M₃ Acetylcholine receptors are cardiac M₄ Acetylcholine receptors glandular
 (c) M₁ Acetylcholine receptors neural M₂ Acetylcholine receptors cardiac M₃ Acetylcholine receptors are confined to glandular M₄ Acetylcholine receptors confined to brain
 (d) M₁ Acetylcholine receptors glandular M₂ Acetylcholine receptors neural M₃ Acetylcholine receptors are confined to brain M₄ Acetylcholine receptors cardiac
78. Is a protein marker which can be detected within three hours of acute ischemic kidney injury from patient's urine
 (a) N-acetyl- β-D-glucose amidinase
 (b) Glutathione-S-transferase
 (c) Neutrophil gelatinase associated lipocalin
 (d) γ-glutamyl transpeptidase
79. Which of the following genes responsible for graft rejection in humans
 (a) Highly polymorphic HLA genes (b) APP genes
 (c) hMSH2 gene (d) FMR1 gene
80. Match List I with List II

List - I		List - II	
1.	Vibrations in skeletal muscles of larynx	[P]	Facial contractions
2.	Involuntary contraction of skeletal muscles that is regulated by the brain	[Q]	Regulate voice
3.	Contraction of skeletal muscles in the legs	[R]	Shivering
4.	Pull of skeletal muscles on attachments to skin of face	[S]	Assists return of blood to the heart
		[T]	Causes facial expressions

Choose the correct answer from the options given below

- (a) 1-[Q], 2-[R], 3-[S], 4-[P]
 (b) 1-[R], 2-[S], 3-[P], 4-[T]
 (c) 1-[Q], 2-[R], 3-[S], 4-[T]
 (d) 1-[R], 2-[S], 3-[T], 4-[P]

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Multiple Choice Questions

Pharmaceutics

1. The USP defines _____ as liquid preparations of vegetable drugs, containing alcohol as a solvent or as a preservative, or both, so made that, unless otherwise specified in an Individual monograph, each milliliter contains the therapeutic constituents of 1 gram of the standard drug that it represents

- (a) Tinctures (b) Extracts
(c) Infusion (d) Fluid extracts

2. Match List I with List II

List-I (Equipment)	List-II (Model/Trade Name/Type)
1. Low shear mixer	[P] Manestry Drycota
2. Rotary tablet machine	[Q] Chilsonator (Fitzpatrick)
3. Capsule filling machine	[R] Shted Double Cone Mixer
4. Compaction mill	[S] Prosolv (IRS Pharma)
	[T] PCF 1200 Model (Pharma Land)

Choose the correct answer from the options given below

- (a) 1-[P], 2-[Q], 3-[S], 4-[R]
(b) 1-[Q], 2-[R], 3-[P], 4-[S]
(c) 1-[R], 2-[P], 3-[S], 4-[Q]
(d) 1-[P], 2-[Q], 3-[S], 4-[R]

3. The properties of solutions containing surface active agents change sharply over a narrow concentration range and are called as

- (a) Critical micelle concentration
(b) Ionic concentration
(c) Hydrogen ion concentration
(d) Surface tension

4. HEPA filters are defined as A or more efficient in removing, from the air. B particles generated by vaporization of the hydrocarbon Emory 3004

- (a) A-99.99% B-0.1 mm
(b) A-99.00 % B-0.3 mm
(c) A-99.99% B-0.3 mm
(d) A-99.00 % B-0.1 mm

5. Name the popular system for ocular delivery of pilocarpine. Based on membrane controlled reservoir systems

- (a) Ocusert (b) Alzet pump
(c) Progestasert (d) Nitrodur

6. The phenomenon of increasing the solubility of weak electrolytes and non-polar molecules by the addition of a water miscible solvent in which the drug has good solubility is called

- (a) Complexation (b) Co-solvency
(c) Solubilization (d) Hydrotrophy

7. The system volume is increased when sheared is called
(a) Dilatant flow (b) Newtonian flow
(c) Plastic flow (d) Pseudoplastic flow

8. The value of R in energy of activation is
(a) 1.98 cal/deg molecule (b) 1.89 cal/deg molecule
(c) 8.91 cal/deg molecule (d) 9.18 cal/deg molecule

9. Which of the following ointment bases is an ingredient of an absorption base

- (a) Petrolatum (b) lanolin
(c) Hydrogenated castor oil (d) cetyl alcohol

10. Chitosan possesses which of the following property

- (a) Hypocholesterolemic
(b) Antimicrobial
(c) Wound healing
(d) all of these

11. p-gp (p-glycoprotein) is highly expressed on the

- (a) Lungs
(b) Pancreas
(c) Superficial columnar epithelial cells of ileum and colon
(d) Heart

12. Select the equation that gives the rate of drug dissolution from a tablet

- (a) Fick's law
(b) Henderson Hasselbalch equation
(c) Noyes Whitney Equation
(d) Michaelis Menten equation

13. Assertion [A] and the other is labelled as Reason [R]
Assertion [A]: Quillala tincture is included in Potassium Citrate Mixture BPC.

Reason [R]: Because Quillala tincture act as an emulsifier in Potassium Citrate Mixture BPC, and prevent separation of lemon oil as a surface layer when the lemon spirit is added. In light of the above statements

Choose the correct answer from the options given below

- (a) Both [A] and [R] are true and [R] is the correct explanation of [A]
(b) Both [A] and [R] are true but [R] is NOT the correct explanation of [A]
(c) [A] is true but [R] is false
(d) [A] is false but [R] is true

14. Powers of drug inspectors appointed under the Drugs and Cosmetic Act, 1940 are mentioned under which of the following section of the Act

- (a) 20 (b) 21 (c) 22 (d) 23

15. Purpose of Seal coating step of Sugar coating is

- (a) Gives smooth surface to the tablet
(b) Enhances weight of the tablet for coating
(c) Gives sweet taste to the Tablet
(d) Prevent moisture penetration into the tablet

79. Which is NOT the colligative property
 [P] Depression of freezing point
 [R] Elevation of vapour pressure
 [Q] Elevation of boiling point
 [S] Osmotic pressure
 Choose the correct one of the following
 (a) (P) (Q) and (S) (b) (P) and (Q)
 (c) (P) and (S) (d) (R) only
80. Substitution constant for Meta benzoic acids is denoted by
 (a) σ_m (sigma m) (b) $pK_a(H)$ (c) ρ_m (rho m) (d) pH_m
81. Which of the following is NOT an intensive property
 (a) Concentration (b) Density
 (c) Pressure (d) Volume
82. A diuretic compound Cyclothiazide has a _____ substituent at C-3 of 1, 2, 4-Benzothiadiazine nucleus
 (a) 5-Bornen-2-yl (b) 5-Norbornen-2-yl
 (c) 2-Bornen-5-yl (d) 2-Norbornen-5-yl
83. Which among the following drugs on standing in aqueous 2,5-bis (aminoxy-methyl) 3, 6-diketopiperazine solution can dimerize to
 (a) Pyrazinamide (b) Ethionamide
 (c) Diethylcarbamazine (d) Cycloserine
84. This compound 2, 5, 8, 11, 14, 17, 20, 23, 26-nona-oxa-octacosan-28-yl p-[butylamino] benzoate is usually known for its _____ activity
 (a) Antifungal (b) Antitussive is used for limit
 (c) Vitamin (d) Glucocorticoid
85. Silver nitrate reagent is used for limit test in Indian pharmacopoeia for
 (a) Lead (b) Iron (c) Chloride (d) Mercury
86. Formaldehyde undergoes Grignard reaction to give
 (a) Primary alcohol (b) Secondary alcohol
 (c) Tertiary alcohol (d) Quaternary alcohol
87. Pyridine upon hydrogenation in presence of platinum at 25°C and 3 ATM pressure yields.
 (a) Piperidine (b) 2, 3-Dihydropyridine
 (c) Pyrazine (d) 3, 4-Dihydropyridine
88. Which of the following drug belongs to class of antibiotic called ansamycins
 (a) Rifampin (b) Streptomycin
 (c) Azithromycin (d) Streptozotocin
89. The dehydration of aldol product of two acetaldehyde molecules through E1cb mechanism affords formation of
 (a) 1-Butenal (b) 2-Butenal
 (c) 3-Butenal (d) 4-Butenal
90. Four-membered fully saturated heterocycle containing one oxygen is called
 (a) Oxiren (b) Oxiran (c) Oxet (d) Oxetane
91. Which among the following cations has the lowest molar ionic conductivity in water at infinite dilution and at 25 degree centigrade
 (a) Hydrogen ion (b) Lithium ion
 (c) Sodium ion (d) Silver ion
92. Formation of pyranose structure from glucose leads to formation of diastereoisomers called
 (a) Anomers (b) Epimers
 (c) Tautomers (d) Metamers
93. The effect of activation or deactivation of an incoming functional group to an aromatic compound is strongest at
 (a) Only ortho position
 (b) Only Meta position
 (c) Only para position
 (d) Both ortho and para positions
94. Which of the following is orally active testosterone derivative having progestational activity
 (a) Oxymesterone (b) Dihydrotestosterone
 (c) Ethisterone (d) Nomegestrol
95. One of the following functional group makes benzoic acid weaker
 (a) Nitro group (b) Hydroxy group
 (c) Chloro group (d) Acetyl group
96. An epoxy ring can be prepared by
 (a) DCC oxidation of alcohol
 (b) Prevost reaction
 (c) Darzens glycidic ester synthesis
 (d) Swern oxidation
97. Amine group protection during peptide synthesis can be accomplished by converting the amine to
 (a) 9-Fluorenylmethylcarbamate (b) 1,3-Dithiane
 (c) Tetrahydropyranyl ether (d) Dimethylacetal
98. In Mier's theory of supersaturation, solubility chart displays the profile of curve with positive and very low slope in
 (a) KNO_3 (b) NaCl (c) $MnSO_4$ (d) None of these
99. Which of the following is a half-reaction
 (a) $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ (b) $H^+ + OH^- \rightarrow H_2O$
 (c) $Ag^+ + e^- \rightarrow Ag$ (d) $Ag^+ Cl^- \rightarrow AgCl$
100. When one of the reactants is present in such great excess that its concentration may be considered constant or nearly so, the reaction is said to be of
 (a) Second order (b) Pseudo-order
 (c) Zero order (d) Third order
101. The absorption maxima of ephedrine hydrochloride and chlorocresol are 257 nm and 279 nm respectively and the A (1%, 1 cm) values in 0.1M hydrochloric acid solution are: 9.0 and zero for ephedrine hydrochloride at 257 nm and at 279 nm respectively. For chlorocresol it is 20.0 and 105.0 at 257 nm and at 279 nm respectively. Calculate the concentration of ephedrine hydrochloride in a batch of Ephedrine hydrochloride injection, diluted 1 to 25 with water, giving the absorbance in 1 cm cell of 0.424 at 279 nm and 0.972 at 257 nm.
 (a) 1.010 mg/ml (b) 6.25 mg/ml
 (c) 12.5 mg/ml (d) 24.75 mg/ml
102. The total number of possible stereoisomers for 3-bromo-2-butanol are
 (a) 2 (b) 4 (c) 6 (d) 8

GPAT-2020

Pharmaceutics

- Hydrated proton is called**
(a) Water proton (b) Hydronium ion
(c) Oxonium ion (d) Proton pump
- Burow's solution is**
(a) Aluminium acetate solution strong
(b) Calcium phosphate solution strong
(c) Ammonium acetate solution strong
(d) Calcium hydroxide solution strong
- When the concentration of an aqueous sodium chloride solution has the same colligative properties as the solution in question, the value so obtained is known as**
(a) Normality (b) Isotonicity value
(c) Molarity (d) Molality
- As per the Drugs and Cosmetics Act-1940, if a drug is not labelled in prescribed manner it is a**
(a) Spurious drug (b) Substandard drug
(c) Adulterated drug (d) Misbranded drug
- The general purpose soda lime glass is not a suitable material for fabricating the container for**
(a) Parenteral (b) Oral solutions
(c) Liquids for external use (d) Dry powders
- The mechanism by which fluorides inhibit dental caries is**
(a) By increasing susceptibility to acid
(b) By increasing the sensitivity of tooth enamel
(c) Decreased acid solubility of enamel
(d) Increased acid solubility of enamel
- When a solid forms a gel more readily when gently shaken or otherwise sheared than when allowed to form the gel while the material is kept at rest, the phenomenon is known as**
(a) Thixotropy (b) Rheopexy
(c) Negative rheopexy (d) Anti thixotropy
- The dispersion of coarse material by shearing in a narrow gap between and a rapidly rotating cone is caused by a static cone**
(a) Colloid Mill (b) Electrical Dispersion
(c) Peptisation (d) Ultrasonic Irradiation
- Which of the following is not a fundamental (primary) factor considered for selection of a location for the construction of pharmaceutical or chemical plant**
(a) Soil (b) Market for products
(c) Labour supply (d) Raw materials
- The drug concentration between Minimum effective concentration (MEC) and maximum safe concentration (MSC) is called**
(a) Toxic range (b) Therapeutic index
(c) Therapeutic ratio (d) Therapeutic range
- Violin gut is obtained from intestine of**
(a) Horse (b) Cat (c) Sheep (d) Camel
- In capsule making the Bloom strength of gelatin is proportional to molecular weight of the gelatin and is a measure of the;**
(a) Cohesive strength of the solvent molecules
(b) Cohesive strength of the crosslinking that occurs between gelatin molecules
(c) Adhesive strength of gelatin with dipping pins
(d) Adhesive strength of gelatin with other polymer
- Dimethyl sulfoxide acts as penetration enhancer for topical formulations by**
(a) Increasing solubility
(b) Denaturing proteins
(c) Increasing transepidermal loss
(d) Altering solvent nature of membrane
- Relative sweetness of sucrose, to saccharin**
(a) 1: 200 (b) 1:500 (c) 1: 100 (d) 1:400
- Choose the wrong statement from the following with regard to Amorphous solids**
(a) Usually they are anisotropic
(b) They tend to flow when subjected to sufficient pressure
(c) Considered as super cooled fluids
(d) They do not have definite melting point
- Following statement is more accurate with respect to limitations of Arrhenius relationship for stability prediction**
(a) Order of degradation will alter at higher temperature
(b) Equal moisture concentrations will be mentioned at different temperatures
(c) Less relative humidity and oxygen solubility at higher temperature
(d) Same degradation mechanisms may predominate at different temperatures
- According to distribution law, select the appropriate expression for the concentration of a solute when it exist as monomer in solvent A and dimer in solvent B**
Assume
C = concentration of solute in solvent A
C_B = concentration of solute in solvent B
α = degree of dissociation
(a) $K = \frac{C_A}{2 \times \sqrt{C_B}}$ (b) $K = \frac{C_A}{C_B \times (1 - \alpha)}$
(c) $K = \frac{C_A}{C_B \times (2 - \alpha)}$ (d) $K = \frac{C_A}{\sqrt{C_B}}$
- Which of the following will result in very closest value to the Glomerular Filtration Rate (GFR)**

[R] Safety and tolerability is evaluated on wider scale
[S] Completion of trial is followed by New Drug Application (NDA)

(a) Phase-III (b) Phase-I (c) Phase IV (d) Phase-II

76. Which one of the following is not affected in respiratory tuberculosis
(a) Pleural cavity (b) Mediastinal lymph nodes
(c) Pericardium (d) Larynx

Pharmacognosy

77. The major property of Ayurvedic herbs "Rasa" indicates
(a) Taste (b) Post digestive effect
(c) Potency (d) Physicochemical properties
78. A fixed oil when added to an equal volume of ethanol, clear liquid is obtained; on cooling at 0°C and on storage for three hours, the liquid remains clear such fixed oil is identified as
(a) Castor Oil (b) Soyabean oil
(c) Neem oil (d) Evening Primrose oil
79. In Abe the mucilage containing parenchymatous cells are present in
(a) Central parenchymatous region
(b) Pericyclic cells
(c) Epidermis
(d) Vascular bundles
80. Which of the following powder shows the greatest degree of dustability
(a) Talcum powder (b) Lycopodium powder
(c) Fine charcoal (d) Potato Starch
81. Dragendorff's reagent is
(a) Potassium iodate
(b) Potassium bismuth iodide
(c) Potassium mercuric iodide
(d) Potassium picrate
82. The fundamental principle "law of similia" falls under which therapy
(a) Syurveda (b) Siddha
(c) Homocopathy (d) Aroma therapy
83. In the process of extraction ethanol is used as a solvent for
(a) Sucrose (b) Waxes (c) Alkaloids (d) Gums
84. Nicotine from tobacco is an alkaloid which is
(a) Oxygen free liquid (b) Semisolid
(c) Crystalline (d) Oxygen free solid
85. In shikimic acid pathway, chorismite mutase converts chorismic acid to
(a) Carotenoids (b) Phytol
(c) Prephenate (Prephenic acid) (d) Gutta
86. Plants which are not differentiated into root, stem and leaves are
(a) Plant aginales
(b) Principes
(c) Thallophyte
(d) Bromeliales

87. In colour test for alkaloids colchicine with mineral acids gives

(a) Blue colour (b) Red colour
(c) Yellow colour (d) Violet colour

88. In yam, the presence of, irregular arrangement of the fibres, the ends of which often project from the surface is because of

(a) Absence of linters (b) Absence of combing
(c) Presence of impurities (d) Improper drying

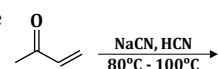
Pharmaceutical Chemistry

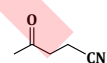
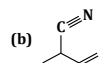
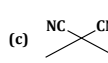
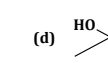
89. Electron releasing groups stabilizes free radicals by
(a) Positive inductive (+I) effect
(b) Negative Mesomeric (-m) effect
(c) Positive Mesomeric (m) effect
(d) Negative inductive (-I) effect

90. Which of the following rearrangement involves migration of a group from carbon to electron deficient nitrogen

(a) Willgerodt rearrangement
(b) Baeyer villiger rearrangement
(c) Pinacol-pinacolone rearrangement
(d) Beckmann rearrangement

91. What is the product of the following reaction

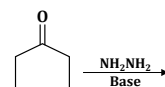






(a)  (b)  (c)  (d) 

92. This 4-amino quinoline antimalarial drug marketed as R. S isomer, has two. trifluoromethyl moieties at position 2' and 8' and no electronegative substituent either at 6 or 7' positions is

(a) Mefloquine (b) Chloroquine
(c) Primaquine (d) Amodiaquine

93. product of the following reaction



(a)  (b)  (c)  (d) 

94. The second law of thermodynamics states that whenever a spontaneous process takes place, it is accompanied by an increase in the total energy of the universe
The equation that satisfies the above law is

(a) $\Delta S_{\text{universe}} = \Delta S_{\text{system}} + \Delta S_{\text{surrounding}}$
(b) $S_{\text{system}} = \Delta S_{\text{universe}} + \Delta S_{\text{surrounding}}$
(c) $\Delta S_{\text{universe}} = \Delta S_{\text{surrounding}} - \Delta S_{\text{system}}$
(d) $\Delta S_{\text{universe}} = \Delta S_{\text{system}} - \Delta S_{\text{surrounding}}$

95. Molar heat capacity of a system is defined as

(a) The amount of heat required to raise temperature of one mole of the system by one Kelvin
(b) The amount of heat required to decrease temperature of one mole of the system by one Kelvin
(c) The amount of heat required to decrease temperature of one mole of the system by one Fahrenheit

GPAT-2019

Pharmaceutics

- Which of the following is NOT a mechanism for achieving gastroretention**
(a) Osmosis (b) Floating
(c) Mucoadhesion (d) Swelling
- Which of the following oxide is not used for achieving Amber color to glass**
(a) Manganese (b) Iron (c) Cobalt (d) Carbon
- Theories of emulsification are characterized by one of the following EXCEPT**
(a) Film formation
(b) Phase inversion
(c) Monomolecular adsorption
(d) Solid particle adsorption
- Movement of charged particle through a liquid under the influence of an applied potential difference is known as**
(a) Sedimentation Potential (b) Streaming Potential
(c) Electrophoresis (d) Electroosmosis
- As per US FDA, NDA's for new chemical entities are classified as either**
(a) 'P' for product review or 'S' for standard review
(b) 'P' for priority review or 'S' for standard review
(c) 'P' for product review or 'S' for safety review
(d) 'P' for priority review or 'S' for safety review
- In tablet, hydroxy propyl methyl cellulose is used as**
(a) Diluent (b) Film former
(c) Disintegrant (d) Binder
- Which one of the following is the property of micro-emulsion**
(a) They have particle size more than 1 micron
(b) They have poor stability
(c) They exhibit a viscoelastic gel phase, when internal phase is added in excess
(d) They have milky yellow colour
- 21 CFR part 211 of USFDA describes**
(a) Current good clinical practice
(b) Current good packaging practice
(c) Current good manufacturing practice
(d) Current good laboratory practice
- "Shake well" label must be placed on the containers of**
(a) Ophthalmic suspension (b) Occuserts
(c) Ophthalmic solution (d) Ophthalmic gels
- In case of Aerosol testing valve delivering acceptance criteria for a volume of 54 ml or**
(a) $\pm 75\%$ (b) $\pm 5\%$
(c) $\pm 10\%$ (d) $\pm 15\%$
- Containers may be rendered free from pyrogens by adequate cleaning and by**
(a) Autoclaving at 121 °C for 15 minutes
(b) Heating at 210°C for 3-4 hours
(c) Autoclaving at 121 °C for 1 hour
(d) Heating at 100°C for 3-4 hours
- GMP regulation are pertaining to minimum requirements to be met by industry when**
(a) Manufacturing, packaging and holding of human drugs and veterinary drugs
(b) Manufacture of human drugs and veterinary drugs
(c) Manufacture and packaging of human drugs and veterinary drugs
(d) Manufacture and holding of human drugs and veterinary drugs
- Which one of the following viscometers can be used for characterizing non-Newtonian system**
(a) Falling sphere viscometer
(b) Cup and Bob viscometer
(c) Capillary viscometer
(d) Hoppler viscometer
- For drug substances with highly variable pharmacokinetic characteristics the following Bioequivalence study design is used**
(a) Parallel Design (b) Non-Replicate Design
(c) Non-Parallel Design (d) Replicate Design
- Roll-tube technique is the modification of**
(a) Pour plate technique
(b) The streak-plate technique
(c) Micromanipulator technique
(d) Spread plate technique
- The following is/are used to determine the amount of drug bound to a protein**
(a) Equilibrium dialysis (b) Solubility
(c) pH titration (d) Distribution method
- Kinetically $\frac{X}{(a-x)}$ kt is the expression for**
(a) First order reaction
(b) Second order reaction
(c) Pseudo first order reaction
(d) Fractional order reaction
- Identify the molecule which will not exhibit Dipole moment**
(a) Carbon dioxide (b) Carbon monoxide
(c) Chloroform (d) Ammonia
- Phase solubility analysis curve is not a good tool for**
(a) Complex formation
(b) Bioavailability determination
(c) Polymorph detection
(d) Impurity detection

Answer Key

1-a	2-c	3-b	4-c	5-b	6-b	7-c	8-c	9-a	10-d
11-b	12-a	13-b	14-d	15-b	16-a	17-b	18-a	19-c	20-b
21-c	22-c	23-d	24-d	25-b	26-a	27-d	28-c	29-d	30-a
31-b	32-c	33-d	34-d	35-a	36-a	37-c	38-b	39-b	40-d
41-d	42-d	43-d	44-c	45-c	46-c	47-a	48-d	49-b	50-a
51-d	52-b	53-c	54-b	55-c	56-c	57-b	58-b	59-d	60-d
61-c	62-c	63-b	64-a	65-a	66-d	67-b	68-d	69-c	70-d
71-b	72-d	73-d	74-b	75-d	76-a	77-b	78-b	79-d	80-d
81-b	82-d	83-a	84-c	85-a	86-b	87-b	88-d	89-b	90-b
91-a	92-c	93-c	94-b	95-d	96-b	97-b	98-d	99-b	100-b
101-b	102-a	103-d	104-d	105-c	106-b	107-d	108-b	109-c	110-c
111-a	112-a	113-d	114-a	115-c	116-c	117-d	118-d	119-b	120-b
121-a	122-c	123-c	124-c	125-c					

GPAT-2018

Pharmaceutics

- Following are endogenous carriers use for targeted drug delivery EXCEPT
(a) Lipoprotein (b) Serum Albumin
(c) Erythrocyte (d) Microparticulates
- Keesom interactions has a force of
(a) 0.5-1 kcal/mol (b) 1-7 kcal/mol
(c) 1-3 kcal/mol (d) None of these
- Dipole-induced dipoles are also known as
(a) London forces (b) Keesom forces
(c) Debye forces (d) Hydrogen bonding
- The angle of repose is calculated by
(a) $\tan \alpha$ Radius/Height (b) $\tan \alpha$ 1+ Radius/Height
(c) $\tan \alpha$ 1- Radius/Height (d) $\tan \alpha$ Height/Radius
- Which method is used by pharmacists for complete blending of potent powders with large quantities of diluents
(a) Spatulation (b) Levigation
(c) Trituration (d) Geometric dilution
- IVIVC utilizes the principles of statistical moment analysis
(a) Level A (b) Level B (c) Level C (d) Level D
- As per Factories Act 1948, in CHAPTER VI dealing with working hours of adults, no adult worker shall be required or allowed to work in a factory for more than _____ hours in a week
(a) 30 (b) 40 (c) 48 (d) 56
- Which of the following is not patentable in India as per the Patents Act 1970
(a) New product
(b) New process
(c) New use of existing drug
(d) New process for existing drug
- Which of the following agencies is not classified as an 'executive agency' for administration of the act under the provision of Drugs and Cosmetics Act 1940
(a) Licensing authority
(b) Drug inspectors
(c) Drugs Consultative Committee
(d) Customs collectors
- Statement 1: Vortex formation can be minimized by push pull mechanism
Statement 2: Vortex formation reduces the mixing intensity by increasing the velocity of impeller
(a) True, False
(b) True, True
(c) False, False
(d) Fake, True
- Which statements are correct for the micelle formation
[P] Micelles are dynamic structures that are continually formed and broken down in solution
[Q] The typical micelle diameter is about 2-3 μm and so they are visible under the light microscope
[R] Micelle formation is a spontaneous process
[S] When the surfactant concentration is increased above the CMC, the number of micelles increases and the free surfactant concentration decreases below CMC
(a) [P] and [Q] (b) [P] and [R]
(c) [P] and [S] (d) [R] and [S]
- When considering drug delivery to the brain which of the following is false
(a) The cells in the blood vessels that supply the brain are tightly connected which restricts drug absorption
(b) Only relatively small lipophilic molecules readily, passively diffuse in to the brain
(c) Drugs with a low log P value show improved passive diffusion into the brain (oil/water partition coefficient)
(d) Polar molecules can be taken up into the brain through active transport
- When K_e is constant and K_a is larger
(a) C_{max} is more and t_{max} is longer
(b) C_{max} is lesser and t_{max} is longer
(c) C_{max} is lesser and t_{max} is short
(d) C_{max} is more and t_{max} is short
- The systems that follows, Weibull Mathematical Model used to describe drug release kinetics are
(a) Swellable polymeric devices
(b) Diffusion matrix formulation
(c) Erodible matrix formulation
(d) Transdermal system
- HLB value of tragacanth is
(a) 4.7 (b) 8.7 (c) 13.2 (d) 14.3
- Substance used to reduce friction during tablet compression and facilitate ejection of tablets from the die cavity is called as
(a) Lubricant (b) Glidant
(c) Anti-adherent (d) Humectant
- What quantities of 95% v/v and 45% v/v alcohols 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% alc
- The proportion of NaCl liquid to give 1.5% solution of drug isotonic with blood plasma is (The freezing point of 1% w/v solution of drug is -0.122 and NaCl is -0.576 °C)
(a) 0.79% (b) 0.585%
(c) 0.9% (d) 0.5%

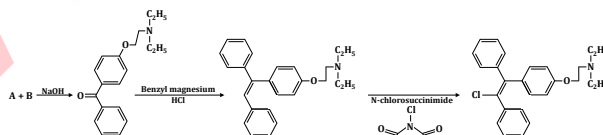
- (c) Beta-adrenoceptor antagonists
(d) Alpha-adrenoceptor antagonists
65. Which of the following antipsychotic drugs, at low doses, is combined with antidepressants in treatment resistant depression
(a) Chlorpromazine (b) Haloperidol
(c) Risperidone (d) Fluphenazine
66. Which of the following are the mechanisms of action of digitalis glycosides
[I] Inhibition of Na⁺-K⁺ ATPase enzyme
[II] Reduction in the auriculo-ventricular conduction rate
[III] Increase in the cardiac output rate
[IV] Acceleration of auriculo-ventricular conduction
(a) Only III (b) I, II and III
(c) II, III and IV (d) Only!
67. Hemophilia A is a disease characterized by deficiency of
(a) Factor VIII (b) Factor II
(c) Factor VII (d) Factor V
68. Identify the specific site where maturation of sperm takes place
(a) Spermatid cord (b) Epididymis
(c) Testis (d) Vas deference
69. Identify the hormone that stimulates sperm production in testes and ovulation in females
(a) Prolactin
(b) Luteinising hormone
(c) Follicle stimulating hormone
(d) Adrenocorticotrophic hormone
70. Identify the clotting factor which is known as Stuart factor or thrombokinase
(a) Clotting factor-IV (b) Clotting factor- VIII
(c) Clotting factor - X (d) Clotting factor-XII
71. Which part of the eye is light sensitive (photosensitive)
(a) Iris (b) Sclera (c) Lens (d) Retina
72. Charaka, a physician belonged to which system of medicine
(a) Ayurveda (b) Unani
(c) Siddha (d) Homeopathy
73. *Alkanna tinctoria* (Boraginaceae) roots are used in
(a) Dandruff
(b) Tooth paste
(c) Facial cleansing wash
(d) Lipstick formulations and hair dyes
74. The CCCN code indicating the botanical drugs is
(a) 2211 (b) 1122 (c) 1211 (d) 1311
75. Tropane alkaloids are biosynthesized from _____ amino acid
(a) Phenylalanine (b) Tyrosine
(c) Ornithine (d) Leucine
76. One mg of *Lycopodium* contains an average of
(a) 97000 spores (b) 96000 spores
(c) 95000 spores (d) 94000 spores
77. *Uncaria gambir* belongs to the family
(a) Rubiaceae (b) Combretaceae
(c) Punicaceae (d) Rosaceae

78. Catechu is used in medicine as an
(a) Antidiabetic (b) Anti cancer
(c) Antipyretic (d) Astringent
79. The constituent of Cochineal is
(a) Cantharidin (b) Hirudin
(c) Tannic acid (d) Carminic acid
80. The sweet taste and odour of fennel is due to
(a) Anethole (b) Fenchone
(c) Eugenol (d) Phelandrene
81. A compound now increasingly used as standard practice for enhancing the flow of rubber latex by spraying on to the scraped bark of the rubber tree increasing the latex yields from 36% to 130% is
(a) Brassinosteroids (b) Abscisic acid
(c) Ethephon (d) Kinetin

Pharmaceutical Chemistry

82. Which statement correctly describes Hess's Law
(a) The enthalpy of all reactants in their standard states is defined as zero
(b) Enthalpy changes can be calculated only if one or more of the reactants is/are element
(c) The enthalpy change of a reaction can be calculated only at 1 atm pressure and 25°C
(d) The enthalpy change of a reaction is independent of the route of reaction

83. Identify the starting material A and B in the synthesis of Clomifene



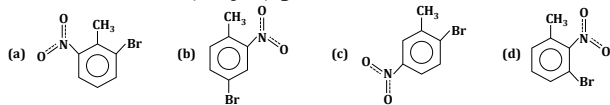
- (a) Where A 4-hydroxy-benzophenone and B 2-diethyl-amino-ethyl chloride
(b) Where A 4-hydroxy benzaldehyde and B 4-methoxy aniline
(c) Where A 4-hydroxy-benzophenone and B 4-methoxy aniline
(d) Where A 4-hydroxy-benzophenone and B benzaldehyde
84. The role of glutathione in tissues includes all EXCEPT
(a) Participate in decomposition of hydrogen peroxide
(b) Participate in activation of methionine
(c) Participate in detoxification reactions
(d) Biologically active in oxidized form
85. Which of the following is a 3, 3-sigmatropic reaction which converts a 1, 5-diene to an isomeric 1,5-diene
(a) Cope rearrangement
(c) Photochemical 2+2 reaction
(b) Claisen rearrangement
(d) Diels-Alder reaction
86. Which statement regarding Huckel's rule is FALSE
(a) There must be (4n+2) pi (π) electrons
(b) The molecule must be planar

GPAT-2017

Pharmaceutics

- Which of the following is not a thermoplastic resin**
(a) Phenolic (b) Polystyrene
(c) Polyethylene (d) Polypropylene
- Which among the following statements describing surface activity for surfactants is incorrect**
(a) Increase in length of hydrocarbon chain decreases surface activity
(b) Increase in ethylene oxide chain of polyoxy ethylated nonionic surfactant ethylene decrease of surface activity
(c) Increase in the surface activity results in decrease in surface tension
(d) Relationship between hydrocarbon chain length and surface activity is expressed by Traube,s rule
- Type IV dissolution apparatus as per USP is**
(a) Flow through cell
(b) Paddle type apparatus
(c) Reciprocating cylinder
(d) Paddle over disk apparatus
- [Weight in pound/150] × Adult Dose = Child dose. The above formula is known as in Posology**
(a) Young's formula (b) Dilling's formula
(c) Clark's formula (d) Friend's formula
- The type of particle diameter obtained by microscopic method of evaluations is**
(a) Projected diameter
(b) Surface – volume diameter
(c) Volume – surface diameter
(d) Stoke diameter
- Apparent volume of distribution will be highest in case of the drug with % plasma protein binding**
(a) 10 (b) 89 (c) 50 (d) 68
- The useful variable form in vitro dissolution test data for IVIVC includes**
(a) $t_{50\%} - t_{63.2\%}$ (b) Sampling interval
(c) Sample volume (d) Volume of dissolution fluid
- For the measurement of particle size of powders, the distance measured between two tangents on opposite sides of the particle parallel to some fixed direction is called**
(a) Feret diameter (b) Martin diameter
(c) Projected area diameter (d) Edmundson diameter
- If the drug substance has been substituted wholly or in part by another drug or substance , it is called as**
(a) Spurious drug
(b) Adulterated drug
(c) Misbranded drug
(d) Mixed drug
- Antioxidant used as blocking agent in sterile product is**
(a) Ascorbic acid esters
(b) Sodium bisulphate
(c) Ascorbic acid
(d) EDTA
- Bulk product is defined as**
(a) Product completing all processing stages but not necessarily final packing
(b) A product ready for final dispatch
(c) Raw material used for making final dosage form
(d) A defined quantity of raw material from the same batch
- If the pKa of probability is 7.9 and pH of the infected tissue is 8.9, the fraction of drug in the ionized form will be**
(a) 10% (b) 1% (c) 90% (d) 99%
- To rule out the probability of dose dumping from an oral CR dosage form, USP has included which sampling time point for in vitro dissolution test where D is normal dosing interval**
(a) 0.50D (b) 0.25D (c) 50-1.0D (d) 1.0-2.0D
- Hot stage microscopy is an important tool in preformulation studies for the study of**
(a) Pseudopolymorphism
(b) Particle size measurement
(c) Microbial contamination
(d) Compaction behavior
- Which among the following is a class-I method, used for rendering a solution of drug isotonic with body fluids**
(a) Cryoscopic sphere viscometer
(b) White – Vincent method
(c) Sprowls method
(d) Hammarlund method
- Hoeppler viscometer is type of**
(a) Failing sphere viscometer
(b) Capillary viscometer
(c) Cup and Bob viscometer
(d) Cone and plate viscometer
- In Bismuth subgallate suppositories B.P.S, when no strength of the drug is specified, B.P.C directs _____ bismuth subgallate per suppository**
(a) 300 mg (b) 200 mg (c) 100 mg (d) 400 mg
- Hixon Crowell's cube root law of dissolution states that**
(a) There is a change in particle size and surface area during dissolution of drug
(b) Dissolution process is controlled by diffusion of molecules / ions
(c) High free energy of activation is required for solution
(d) Renewal of surface fluid layer around drug particle

87. In the reaction of 2-nitrotoluene with bromine in presence of iron, which of the product shown below is the most abundant (major) product



88. Which of the following cannot react as a nucleophile



89. Which of the following compounds will be oxidized by Cro, in acid

- (a) 4-Methylcyclohexene
 (b) 3-Methyl 3-hydroxycyclohexanone
 (c) 4, 4-Dimethyl-1-methyl-1, 3-cyclohexandiol
 (d) 2-Methylcyclohexanone

90. Which of the following compounds absorbs at the longest wavelength

- (a) 1, 3, 5 - Hexatriene
 (b) 1,3,5,7-Octatetraene
 (c) 1,7-Diphenyl-1,3,5-heptatriene
 (d) 1,6-Diphenyl-1,3,5-heptatriene

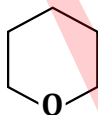
91. Which of the following reagents will reduce a disubstituted alkyne to trans - alkene



92. Which of the following statement is true about follow- ing reaction

- (a) The product will not have a stereo center
 (b) The product will have R configuration
 (c) The product will not have S configuration
 (d) The reaction will happen with racemization

93. Which functional group is present in the molecule shown below



- (a) Amide
 (b) Alcohol
 (c) Ester
 (d) Ether

94. Chemical class of drugs that are susceptible to oxidation are

- (a) Esters (b) Lactam (c) Sterols (d) Carbamate

95. The only analgesic acting centrally is

- (a) Methadone (b) Naloxone
 (c) Tramadol (d) Naloxone Congeners

96. Which among the following describe the characteristic features of Tetracycline

- (a) Undergoes epimerization in solutions having intermediate pH range
 (b) Forms anhydrous tetracycline in presence of acidic
 (c) Forms Minocycline in basic medium
 (d) Forms stable chelate complexes with potassium ions

- (a) 577.2 nm (b) 587.2 nm
 (c) 567.2 nm (d) 597.2 nm

98. Which among the following statements on electro analytical methods are correct

- (a) Measures conductance between two electrodes with AC powered Wheatstone bridge
 (b) Polarography involves plotting of conductance - voltage
 (c) Potentiometry involves application of Ilkovic equation
 (d) Coulometry involving application of Nernst law relating equivalence between quantities

99. Separating techniques such as gas chromatography and liquid chromatography are not appropriate for separation of amino acids. Select correct reason from the following

- (a) Amino acids high polarity substances
 (b) Amino acids are low polarity substances
 (c) Amino acids are non-polar substances
 (d) Amino acids lowly charges substances

100. Which among the following rules about spin - spin coupling and bond multiplicities are correct with regard to NMR spectra

- (a) Coupling constant rarely exceeds 20 cps while chemical shifts are over 1000 cps
 (b) Spin - Spin interactions are dependent of strength of the applied field
 (c) Coupling constants increase with distance
 (d) Equivalent nuclei interact with each other to show interaction

101. Chemical interferences are common than spectral interferences due to

- (a) Formation of compounds of low volatility
 (b) Ionization in flames
 (c) Increase in rate of atomization
 (d) No shift in ionization equilibrium

102. One of the principles upon which HPLC detector functions is

- (a) Redox property of solute is the basis for functioning of electrochemical detectors
 (b) Fluorimetric detector has high selectivity and low sensitivity
 (c) Small difference in Refractive Index of mobile phase permit precise measurements in Refractive Index detectors
 (d) UV detector function based on its ability to detector

103. Which among the following electronic systems are not involved in the origin of UV spectrum

- (a) s and p shell electrons (b) σ and π electrons
 (c) Charger transfer electrons (d) d and f shell electrons

Other Subjects

104. Rubella virus is associated with disease

- (a) Progressive encephalitis
 (b) Enterovirus infection
 (c) Yellow fever
 (d) Brucellosis

Pharmaceutical Analysis

97. If the excitation energy of the resonance level is 2.10 eV (when $hc=12,330$) then the wave-length of resonance line of sodium atoms is

GATE-2008

Pharmaceutics

- An antidiabetic drug Pioglitazone used in Type 2 diabetes acts by**
 - Decrease of glucose uptake in muscles
 - Increasing insulin sensitivity
 - Inhibiting Intestinal α -glucosidase
 - Stimulating insulin secretion
- An angiotensin II receptor blocker useful in treating hypertension is**
 - Enalaprilat
 - Valsartan
 - Atenolol
 - Amlodipine
- Co-administration of NSAIDs with wartasin may often lead to**
 - Antagonistic interaction
 - Interaction due to change in drug transport
 - Interaction due to disturbances in electrolyte balance
 - Additive or synergistic interaction
- Laminaria and Kelp are the principal genera, currently used for the industrial production of**
 - Carrageenans
 - Agar
 - Fucans
 - Alginic acid and alginates
- A transverse section of Glycyrrhiza glabra when treated with 80% sulphuric acid gave**
 - Deep yellow color
 - No reaction, but only charring
 - Deep blue color
 - Deep red color
- Microscopy of the bulbs of firginea indica family Liliaceae shows**
 - Prisms of calcium oxalate
 - Calcium carbonate and silica
 - Rosettes of calcium oxalate
 - Raphides of calcium oxalate
- Streptomycin is a**
 - Di-acidic base possessing an aldehydic carbonyl group
 - Tri-acidic base possessing an aldehydic carbonyl group
 - Neutral compound possessing a ketonic group
 - Acid compound possessing a carboxyl group
- The antihistaminic with diphenyl methyl group is**
 - Methdilazine
 - Cyclizine hydrochloride
 - Pheniramine
 - Phenindamine
- Heterocyclic rings present in pilocarpine are**
 - Imidazole and Quinoline
 - Imidazole and Thiazole
 - Quinoline and Phenanthrene
 - Imidazole and Dihydrofuran
- The most important microbial virulence factor in etiology of meningitis is**
 - Exotoxin
 - Components of the capsule
 - Coagulase
 - Hyaluronidase
- Commonly used tetanus vaccine is produced by**
 - Treatment of the causative organism with heat or UV light and finally obtaining the toxoid
 - Sub-culturing the virus at pH 10.4
 - Artificially generating antibodies to viral glycoproteins
 - Isolating the antigenicity genes from the causative organism
- Which of the following equations is valid for standard B-DNA**
 - $A + T = G + C$
 - $A + T = 2(G + C)$
 - $2(A + 1) = 3(G + C)$
 - $A + G = T + C$
- Clinical jaundice, typified by yellowing of the tissues is associated with elevated level of**
 - Serum lysozyme
 - Serum bilirubin
 - Serum creatinine
 - Serum γ -glutamyl transferase
- In NMR spectrometry the chemical shift (δ) is expressed in**
 - Parts per million
 - Gauss
 - Tesla
 - Hertz
- In chromatographic separation, the different species in the sample undergo the process of**
 - Chemical interaction
 - Partition
 - Volatilization
 - Ionization
- A target material used in the production of X-rays is**
 - Potassium
 - Copper
 - Aluminium
 - Sodium
- The requirement and guidelines for clinical trials, import and manufacture of new drugs as per the Drugs & Cosmetics Rules is given under Schedule**
 - N
 - Y
 - A
 - B
- The growth of large particles at the expense of smaller ones, as a result of a difference in the solubility of the particles of varying sizes, is termed as**
 - Interfacial phenomenon
 - Partitioning
 - Erosive formulation
 - Ostwald ripening
- Cyclic oligomers of glucose that form water soluble inclusion complexes, which are biocompatible and improve the bioavailability of drugs**
 - Chlorophyll
 - Polyethylene glycol
 - Cross povidone
 - Cyclodextrin
- 'Draves test is associated with measuring the efficiency of**
 - Detergent
 - Wetting agents
 - Suspending agents
 - Adsorbent
- Effect of fibrates on blood lipids are mediated by**
 - Inhibiting both synthesis and esterification of fatty acids
 - Their interaction with peroxisome proliferator activated receptors (PPARs)
 - Reducing the conversion of HMG-CoA to mevalonate
 - Sequestering bile acids

Group I	Group II
Name of equation	Equation
1. Noyes & Whitney equation	[P] $dc/dt = DS/h$ (CS-C)
2. B.E.T equation	[Q] $P/V(P_O - P) = 1/(V_m b) + (b-1)/(V_m b) P/P_O$
3. Stokes equation	[R] $V = (d^2 (P_S - P_O) g) / (18\eta_0)$
4. Higuchi equation	[S] $Q = [D(2A - CS) CS \times t]^{1/2}$

- (a) 1-[S], 2-[Q], 3-[R], 4-[P]
 (b) 1-[Q], 2-[S], 3-[P], 4-[R]
 (c) 1-[R], 2-[P], 3-[Q], 4-[S]
 (d) 1-[P], 2-[Q], 3-[R], 4-[S]

Group I	Group II
Types of coating	Coating material
1. Seal coating	[P] HPMC
2. Sub coating	[Q] Carnauba wax
3. Polishing	[R] Gelatin
4. Film coating	[S] PEG 4000

- (a) 1-[S], 2-[R], 3-[Q], 4-[P]
 (b) 1-[R], 2-[P], 3-[S], 4-[S]
 (c) 1-[S], 2-[Q], 3-[P], 4-[R]
 (d) 1-[P], 2-[Q], 3-[R], 4-[S]

Group I	Group II
Interacting drugs	Pharmacological effect
1. Verapamil and Atenolol	[P] Increased risk of hyperkalemia
2. Clozapine and Co-trimoxazole	[Q] Bradycardia and asystole
3. Alcohol and Flunitrazepam	[R] Increased risk of bone marrow suppression
4. Ramipril and Amiloride	[S] Severe CNS depression

- (a) 1-[S], 2-[Q], 3-[R], 4-[P]
 (b) 1-[Q], 2-[R], 3-[S], 4-[P]
 (c) 1-[R], 2-[S], 3-[Q], 4-[P]
 (d) 1-[S], 2-[P], 3-[Q], 4-[R]

Group I	Group II
Receptors	Agonists
1. B-adrenergic (Type 2)	[P] Phenylephrine
2. a-adrenergic (Type 1)	[Q] Bromocriptine
3. Dopaminergic (Type 2)	[R] Ritodrine
4. 5-hydroxy tryptamine (Type 1A)	[S] Buspirone

- (a) 1-[P], 2-[S], 3-[R], 4-[Q]
 (b) 1-[R], 2-[Q], 3-[S], 4-[P]
 (c) 1-[Q], 2-[R], 3-[S], 4-[P]
 (d) 1-[R], 2-[P], 3-[Q], 4-[S]

Group I	Group II
Receptors	Mechanisms

1. Terbinafine	[P] Inhibition of reverse transcriptase
2. Cidofovir	[Q] Selective inhibition of squalene epoxidase
3. Imatinib	[R] Inhibition of DNA polymerase
4. Stavudine	[S] Tyrosine kinase inhibitor

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[Q], 2-[R], 3-[S], 4-[P]
 (d) 1-[R], 2-[Q], 3-[P], 4-[S]

Group I	Group II
Materials used	Instrumental techniques
1. Sodium chloride	[P] Colorimetry
2. Glass	[Q] UV spectrophotometry
3. Quartz	[R] X-ray diffraction
4. Potassium hydrogen phthalate	[S] IR spectrophotometry

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[P], 3-[Q], 4-[R]
 (c) 1-[R], 2-[S], 3-[P], 4-[Q]
 (d) 1-[Q], 2-[R], 3-[S], 4-[P]

Group I	Group II
Drugs	B.P. Assay
1. Iopanoic acid	[P] Titration of a solution in anhydrous formic acid and acetic anhydride with 0.1 N perchloric acid
2. Cyclizine hydrochloride	[Q] Titration of a solution in dimethyl formamide with 0.1M tetrabutyl ammonium hydroxide
3. Chirothiazide	[R] Treating with sodium hydroxide and zinc powder and then titration with 0.1 N silver nitrate
4. Chirambucil	[S] Titration with 0.1 N sodium hydroxide using phenolphthalein indicator

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[Q], 2-[S], 3-[P], 4-[R]
 (c) 1-[S], 2-[R], 3-[P], 4-[Q]
 (d) 1-[R], 2-[P], 3-[Q], 4-[S]

Group I	Group II
Techniques	Related equations
1. Potentiometry	[P] $i_d = 708 n CD^{1/2} m^{2/3} t^{1/6}$
2. Polarography	[Q] $VR = tR FC$
3. Colorimetry	[R] $E = E^0 - RT/nF \log[H^+]$
4. Column chromatography	[S] $A = \epsilon bc$

- (a) 1-[P], 2-[S], 3-[R], 4-[Q]
 (b) 1-[R], 2-[Q], 3-[P], 4-[S]
 (c) 1-[Q], 2-[P], 3-[S], 4-[R]
 (d) 1-[R], 2-[P], 3-[S], 4-[Q]

GATE-2003

- Colchicine is biogenetically derived from one of the following**
 - Tyrosine and Phenylalanine
 - Tryptophan and Phenylalanine
 - Ornithine and Tryptophan
 - Ornithine and Phenylalanine
- The diagnostic character for the microscopically identification of Kurchi bark is**
 - Fibers with Y-shaped pits
 - Horse shoe shaped stone cells
 - Steroids containing calcium oxalate crystals
 - Stratified cork
- It is possible to initiate the development of complete plants from callus cell cultures by suitable manipulation of the medium with respect to**
 - Minerals
 - Vitamins
 - Carbohydrates
 - Hormones
- Polyploidy is defined as**
 - Addition of one chromosome
 - Multiplication of entire chromosome set
 - Submicroscopic change in DNA material
 - Gross structural change
- The starting material for the synthesis of Alprazolam is**
 - 3 amino 5 bromoacetophenone
 - 2 amino 5-chloroacetophenone
 - 2 amino 5-chlorobenzophenone
 - 3-amino 5 chlorobenzophenone
- Simplification of Morphinan system gave one Benzomorphan derivative**
 - Pentazocin
 - Pethidine
 - Levorphanol
 - Buprenorphine
- A metabolite of Spironolactone is**
 - Aldosterone
 - Canrenone
 - Corticosterone
 - Pregnenolone
- The IUPAC name for Naproxen is**
 - 4-2-(6-ethoxy-2-naphthyl)-acetic acid
 - 4-2-(6-methoxy-2-naphthyl)-acetic acid
 - 4-2-(6-ethoxy-2-naphthyl)-propionic acid
 - 4-2-(6-methoxy-2-naphthyl)-propionic acid
- The metabolic function of Riboflavin involves the following**
 - FMN and FAD
 - NADP and NADPH
 - AMP and ATP
 - Retin and Retinine
- X-ray spectral lines K_{α} doublet arises from transition of electrons from**
 - M shell to K shell
 - L shell to K shell
 - L shell to M shell
 - M shell to L shell
- The method of expressing magnetic field strength**
 - Cycles/sec
 - Pulses/sec
 - Debye unis
 - Gauss
- A solvent used in NMR studies is**
 - Chloroform
 - Acetone
 - Carbon tetrachloride
 - Methanol
- A widely accepted detector electrode for pH measurement is**
 - Platinum wire
 - Glass electrode
 - Ag-AgCl electrode
 - Lanthanum fluoride
- Commercial production of citric acid is carried out by the microbial culture of**
 - Fusarium moniliforme
 - Rhizopus nigricans
 - Aspergillus Niger
 - Conidium utilis
- For thermophilic micro-organisms, the minimum growth temperature required is**
 - 20°C
 - 37°C
 - 45°C
 - 65°C
- Obligatory anaerobes**
 - Can tolerate oxygen and grow better in its presence
 - Do not tolerate oxygen and die in its presence
 - Can grow in oxygen levels below normal
 - Can grow in presence of atmospheric oxygen
- Plasmid is a**
 - Macromolecule involved in the protein synthesis
 - Circular piece of duplex DNA
 - A hybrid DNA that is formed by joining pieces of DNA
 - Endogenous substance secreted by one type of cell
- Lactose intolerance is because of the lack of**
 - Acid phosphates
 - Lactate dehydrogenase
 - Galactose-1-phosphate-uridyl transferase
 - Amylase
- Synthesis of UREA takes place exclusive in**
 - Kidney
 - Liver
 - Gall bladder
 - Urinary bladder
- A term which describes a cofactor that is finally bound to an apoenzyme**
 - Holoenzyme
 - Prosthetic group
 - Coenzyme
 - Transferase
- How many parts of 10% ointment be mixed with 2 parts of 15% ointment to get 12% ointment**
 - 2
 - 3
 - 5
 - 6
- The correct non ionic surfactant used as a penetration enhancer in the preparation of mucoadhesives is**
 - Oleic acid
 - Tween-80
 - Glycerol
 - Propylene glycol

29. In different samples of adulterated *Atropa belladonna* leaves, following unique characters are noted. Match with adulterants
- | | |
|---|---------------------------------|
| 1. Idioblast observed | [P] <i>Solanum nigrum</i> |
| 2. Lamina is denser, Needle shaped Crystals, Anomocytic stomata, Palisade ratio 2-4 | [Q] <i>Phytolacca americana</i> |
| | [R] <i>Ailanthus glandulosa</i> |
| | [S] <i>Datura stramonium</i> |
- (a) 1-[Q], 2-[P] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]
30. Match the *Digitalis aglycone* with appropriate hydroxy cardenolides
- | | |
|----------------|--|
| 1. Gitoxigenin | [P] 3 β , 12 β , 14 β trihydroxy cardenolide |
| 2. Digoxigenin | [Q] 3 β , 14 β dihydroxy cardenolide |
| | [R] 3 β , 14 β , 16 β trihydroxy cardenolide |
| | [S] 3 β , 12 β , 6 β trihydroxy cardenolide |
- (a) 1-[Q], 2-[S] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]
36. The systematic names of the following drugs are given. Match them
- | | |
|---------------------------|--|
| 1. Tinidazole | [P] 2-[4-(3-(2-trifluoro-methyl pheno selenazine-10-yl) propyl piperazine-1-yl)] ethanol |
| 2. Fluphenazine decanoate | [Q] 1-[2-(ethyl sulphonyl) ethyl]-2-methyl-5-nitro imidazole |
| | [R] 1-[2-ethyl sulphonyl)-propyl]-2-methyl-5-nitro imidazole |
| | [S] 2-[4-(3-(2-trifluoro-methyl phenothiazin-10-yl) propyl piperazin-1-yl)] decanoate |
- (a) 1-[Q], 2-[S] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]
37. Match the heterocyclic system with the drug
- | | |
|--------------|------------------|
| 1. Aziridine | [P] Thiotepea |
| 2. Pteridine | [Q] Azathioprine |
| | [R] Atropine |
| | [S] Methotrexate |
- (a) 1-[Q], 2-[S] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]

Pharmaceutical Chemistry

31. B-phenyl-N-alkyl piperidine moiety is largely responsible for activity in following. Choose the correct one
- (a) Buprenorphine (b) Pethidine
(c) Cycloserine (d) Amitriptyline
32. Which one of the following is a Histamine H₁ receptor antagonist
- (a) 4-(S-H) di benzo [a,d] cyclohexen-5-ylidene)-1-methyl pyridine hydrochloride
(b) 4-(S-H) di benzo [a,d] cyclohexen-5-ylidene)-1-methyl pyrimidine hydrochloride
(c) 4-(5-H di benzo [a,d] cyclohexen-5-ylidene)-1-methyl piperidine hydrochloride
(d) 4-(5-H di benzo [a,d] cyclopenten-5-ylidene)-1-methyl piperazine hydrochloride
33. Which one of the following is a Histamine H₁ receptor antagonist
- (a) 4-Hydroxy propiophenone
(b) 4-amino acetophenone
(c) 4-Chloro butyrophenone
(d) 4-Bromo propiophenone
34. One of the following diuretics has a similar structure as that of antihypertensive agent diazoxide
- (a) Acetazolamide (b) Chlorothiazide
(c) Spironolactone (d) Furosemide
35. Which one of the following is an antifungal polyene macrolide antibiotics with seven conjugated double bond, an internal ester, a free carboxyl group and a glycoside side chain with primary amino group
- (a) Streptomycin (b) Echinocandins
(c) Rifamycin (d) Amphotericin-B

Pharmaceutical Analysis

38. Choose the correct source of radiation for N.M. from the listed ones
- (a) Klystron oscillator (b) Globar source
(c) Radio frequency oscillator (d) Deuterium lamp
39. Choose the correct semi-rigid gel used for exclusion chromatography
- (a) Sephadex (b) Gelatin
(c) Cellulose (d) Alumina
40. One of the following is measured in amperometric titration
- (a) Resistance (b) Conductance
(c) Voltage (d) Current
41. Techniques mentioned n [P] to [S] used for the analysis of the following drugs
- | | |
|----------------------|---------------------------|
| 1. Sulphamethoxazole | [P] Conductometry LP |
| 2. Piroxicam LP | [Q] HPLC |
| | [R] Non-aqueous titration |
| | [S] Dead stop end point |
- (a) 1-[S], 2-[Q] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]
42. Match the correct formula for given terms
- | | |
|---------------------------------|-----------------|
| 1. Molar absorption coefficient | [P] cl/A |
| 2. Frequency | [Q] A/cl |
| | [R] $1/\lambda$ |
| | [S] c/λ |
- (a) 1-[Q], 2-[S] (b) 1-[R], 2-[S]
(c) 1-[R], 2-[P] (d) 1-[P], 2-[S]

GATE-1996

PART - A Section-I (Choose The Correct Answer)

1. For each question given below four answers are provided, out of which only one is correct. Write the correct answer on the answer book by writing (a), (b), (c) or (d) against the corresponding subquestion number in the answer book

1.1 Clonidine hydrochloride - IP is

- (a) Monoamine oxidase inhibitor which contains an imidazoline ring system
- (b) Arterial venous vasodilator which contains imidazoline ring system
- (c) Monoamine oxidase inhibitor which contains Pyrimidine ring system
- (d) Monoamine oxidase inhibitor which contains Phthalazine ring system

1.2 Bortrager's test is performed for identification of

- (a) Digitoxin
- (b) Reserpine
- (c) Digoxin
- (d) Dianthrone of rhein

1.3 The electrode system employed in potentiometric titrations of aids by Non-aqueous method in basic solvent is

- (a) Glass Calomel electrodes
- (b) Antimony Glass electrodes
- (c) Glass-Antimony electrodes
- (d) Antimony-Calomel electrodes

1.4 The drug Naloxone

- (a) Produces morphine like activity
- (b) Produces respiratory depression
- (c) Induces constipation
- (d) Precipitates withdrawal symptoms in morphine

1.5 Phenyl alanine, Ornithine and methionine are involved in the biogenesis of

- (a) Lysergic acid
- (b) Reserpine
- (c) L-Hyoscyamine
- (d) Papaverine

1.6 The area under the serum concentration time-curve represents the

- (a) Biological half-life of the drug
- (b) Amount of drug is cleared by the kidneys
- (c) Amount of drug absorbed
- (d) Amount of drug excreted in the urine

1.7 An interference filter consists of

- (a) An iron plate coated with selenium
- (b) A layer of silver deposited on glass coated with MgF_2
- (c) A Tungsten plated coated with silver oxide
- (d) A solid sheet of glass coloured by pigment

1.8 Which of the following is the first process that must occur before a drug can become available for absorption from a tablet dosage form

- (a) Dissolution of the drug in the GI fluids
- (b) Dissolution of the drug in the epithelium
- (c) Ionisation of the drug
- (d) Disintegration of the tablet

1.9 Propranolol

- (a) Reduces myocardial oxygen consumption
- (b) β_1 receptor selective blocker
- (c) Has intrinsic sympathomimetics activity
- (d) Is a hypotensive agent in patients with normal blood pressure

1.10 2-bis (2 chloroethyl) amino pre hydro 1, 3, 2 oxazaphosphorine is an

- (a) Anti-metabolite
- (b) Alkylating agent
- (c) Anti-tubercular agent
- (d) Anti-arrhythmic drug

1.11 A moiety of a molecule responsible for selective absorption of radiation in a specific Range is called as

- (a) Auxochrome
- (b) Catalyst
- (c) Chromophore
- (d) Elicitor

1.12 Chlordiazepoxide is synthesized from

- (b) p-Chloroaniline and Benzyl chloride
- (a) m-Chloroaniline and Benzyl chloride
- (d) p-Nitroaniline and Benzyl chloride
- (c) p-Chloroaniline and Benzidine

1.13 Tablets are placed into a coating chamber and hot air is introduced through the bottom of the chamber. Coating solution is applied through an atomizing nozzle from the upper end of the chamber. This technique is called

- (a) Sealing before sugar coating
- (b) Coating by air suspension
- (c) Spray-pan coating
- (d) Chamber coating

Section – II (Match The Following)

1.14 In the following three questions match each the items 1, 2, 3 and 4 on the left, with an appropriate item on the right and indicate the answer as for example

2.1. Match the following terms with Phytoconstituents mentioned below

- | | |
|-----------------|-----------------------------|
| 1. Opium | [P] Tropane alkaloids |
| 2. Ergometrine | [Q] Cardiac glycosides |
| 3. Scopolamine | [R] Latex of poppy capsules |
| 4. Ginsenosides | [S] Oxytocic effect |
| | [T] Adaptogenic and tonic |
| | [U] Cyanogenetic aglycone |

1. Agar [P] Chief carbohydrate from *Macrocystis pyrifera*
 2. Carrageenan [Q] Dried exudates from *Astragalus gummifer*
 3. Tragacanth [R] Closely related hydrocolloids from *Chondrus crispus*
 4. Algin [S] Hydrophilic colloid from *Gelidium cartilagineum*
 [T] Powdered endosperm of the seeds of *Cyamopsis tetragonolobus*
 [U] Carbohydrates from the Rhizomes of *Zingiber* sps.

- (a) 1-[S], 2-[R], 3-[Q], 4-[P]
 (b) 1-[P], 2-[R], 3-[S], 4-[T]
 (c) 1-[P], 2-[R], 3-[T], 4-[S]
 (d) 1-[P], 2-[Q], 3-[R], 4-[U]

ii. Listed are drugs 1 to 4. Their appropriate antihypertensive mechanisms are given in [P] to [U]. Match them correctly

1. Pindolol [P] Vasodilator
 2. Minoxidil [Q] Angiotensin converting enzyme inhibitor
 3. Captopril [R] Diuretic
 4. Amiloride [S] β -blocker
 [T] Centrally acting alpha adrenoceptor agonist
 [U] Potassium induction

- (a) 1-[S], 2-[Q], 3-[U], 4-[P]
 (b) 1-[P], 2-[R], 3-[S], 4-[T]
 (c) 1-[P], 2-[R], 3-[T], 4-[S]
 (d) 1-[S], 2-[P], 3-[Q], 4-[R]

iii. Listed below are substances which are assayed by organisms mentioned in [P] to [U]. Match them correctly

1. Crystal Violet I.P. [P] *Pasteurella pestis*
 2. Ampicillin LP. [Q] *Bacillus cerus*
 3. Plague Vaccine I.P. [R] *Macrococcus luteus*
 4. Rifampicin L.P. [S] *Staphylococcus aureus*
 [T] *Lactobacillus aureus*
 [U] *Bacillus subtilis*

- (a) 1-[S], 2-[R], 3-[P], 4-[U]
 (b) 1-[P], 2-[R], 3-[S], 4-[T]
 (c) 1-[P], 2-[R], 3-[T], 4-[S]
 (d) 1-[P], 2-[Q], 3-[R], 4-[U]

iv. Important Psychoactive Phenothiazines listed below have the following side chains at position 10, which are given in [P] to [U]. Match them correctly

1. Chlorpromazine [P] 3-[4-methyl Piperazine 1-yl] Propyl
 2. Prochlorperazine [Q] 2-[1 methyl Piperid 2-yl] ethyl
 3. Thioridazine [R] 3-[4-(2 hydroxy ethyl) Piperazine 1-yl] propyl
 4. Perphenazine [S] Dimethyl amino ethyl
 [T] Dimethyl amino propyl
 [U] Dimethyl amino butyl

- (a) 1-[S], 2-[Q], 3-[U], 4-[P]
 (b) 1-[T], 2-[P], 3-[Q], 4-[R]
 (c) 1-[P], 2-[R], 3-[T], 4-[S]
 (d) 1-[P], 2-[Q], 3-[R], 4-[U]

v. Listed below are the physical forms of the medications which normally show the rheological properties given in [P] to [U]. Match them correctly

1. Viscous oils [P] Dilatant flow
 2. Gellies [Q] Plug flow
 3. Colloids [R] Newtonian flow
 4. Concentrated solid suspension [S] Plastic flow
 [T] Pseudoplastic flow
 [U] non-Newtonian flow

- (a) 1-[R], 2-[T], 3-[U], 4-[S]
 (b) 1-[P], 2-[R], 3-[S], 4-[T]
 (c) 1-[P], 2-[R], 3-[T], 4-[S]
 (d) 1-[P], 2-[Q], 3-[R], 4-[U]

PART - B

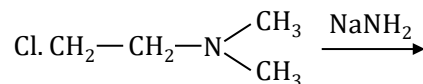
5. Complete the following reactions. Give the structural formula of the facts (In the answer book write the relevant products and their natural formula against each bold digit)

(i) Ethyl p-amino benzoate + 2 diethyl amino ethanol
 $\text{NaO}C_2H_5$ 1. _____

(ii) 2-Amino-5-chloro benzophenone + Ethyl glycinate
 Pyridine 2. _____ NaOCH_3 3. _____
 $(\text{CH}_3\text{CO})_2\text{SO}_2$

(iii) 5-Methyl-iso oxazol 3 ethyl carboxylate + Benzyl hydrazine \longrightarrow 4. _____

(iv) 10, 11 Dihydro-5H dibenz (b-f) azepine + $\text{-C}_2\text{H}_5\text{OH}$



6. Draw the structural formulae of the following

- (i) A dibenzazepine derivative which is an anticonvulsant
 (ii) A piperdine derivative which is an opioid analgesic
 (iii) A naphthaquinone derivative which is a vitamin
 (v) Quinoline and pyrrole moieties in the structure, which is an anthelmintic
 (iv) A benzomorphan derivative which is an analgesic

7. List five important requirements in the formulation of controlled release parenterals. Each requirement should be written in one sentence only

8. (i) Ergot alkaloids are obtained on a commercial scale by two different methods. What are they
 (ii) What reagent is used for colorimetric assay of Ergot alkaloids

GATE-1993

PART - A SECTION-I (Choose The Correct Answer)

1. **Multiple choice question**
- i. **Triamcinolone is**
(a) 9 a-Fluoro-16 a-hydroxyprednisolone
(b) 9 B-Fluoro-16 a-hydroxyprednisolone
(c) 9 a-Fluoro 16 l-hydroxyprednisolone
(d) 9 a-Bromo-16 a-hydroxyprednisolone
- ii. **Surfactants are characterized by the presence of**
(a) Water solubilising groups alone
(b) Fat solubilizing groups alone
(c) Water and fat solubilising groups in the same molecule
(d) Groups with positive charge
- iii. **Gamma-globulin is separated from serum by**
(a) Agglutination (b) Dialysis
(c) Centrifugation (d) Salting out
- iv. **The stationary phase in Thin-layer chromatography is**
(a) Liquid held between glasses (b) Silica gel
(c) Glass Plate (d) None of the above
- v. **Benzoyl peroxide is**
(a) An astringent (b) An emollient
(c) A preservative (d) A keratolytic
- vi. **Water for injection differs from sterile distilled water as it is free from**
(a) Carbon dioxide (b) Pyrogens
(c) Preservatives (d) Antioxidant
- vii. **The correct equivalent for -10°C is**
(a) -10°F (b) +22°F (c) -18°F (d) +14°F
- viii. **The active metabolite of anti-cancer cyclophosphamide is**
(a) N-hydroxyl cyclophosphamide
(b) N-methyl cyclophosphamide
(c) 4-hydroxyl cyclophosphamide
(d) N-acetyl cyclophosphamide
- ix. **Mebendazole, an anthelmintic drug, has one group at 5-position in the Benzimidazole structure. It is**
(a) -S-CH₂-CH₂-CH₃ (b) -S-Ph
(c) Ph-SO₂- (d) Ph-CO-
- x. **Sedative action of barbiturates is due to substituents at C, It is due to**
(a) High lipophilicity of groups at C, position
(b) Electronic withdrawing effect
(c) Steric effect
(d) Metal chelation
- xi. **Monoamine oxidase (MAO) Inhibitors have serious side effects and toxicities. The Alternate drugs of choice are**
(a) Tricyclic antidepressants (b) Hallucinogens
(c) Amphetamines (d) Xanthine alkaloids
- xii. **Sterility test for the materials meant for surgical suture requires incubation for**
(a) 7 days (b) 14 days (c) 21 days (d) 28 days
- xiii. **Silver-Silver chloride electrode consists of**
(a) Silver wire coated with calomel
(b) Silver wire coated with potassium chloride
(c) Silver wire coated with silver chloride
(d) Platinum wire coated with silver chloride
- xiv. **Extinction E=**
(a) $\log(I_0/I_t)$ (b) $\log T$
(c) I_t/I_0 (d) $I_0 I_0^{-ct}$
- xv. **Senna leaf LP. Consists of**
(a) Dried leaflets of Cassia acutifolia and Cassia angustifolia
(b) Dried leaflets of Cassia indica
(c) Dried leaflets of Cassia carpinifolia
(d) Dried leaflets of Cassia carpinifolia and Cassia acutifolia
- xvi. **Conformational isomerism is**
(a) Cis-trans isomerism
(b) Optical isomerism
(c) Dextro-and levo-rotatory
(d) Non-Identical spatial arrangement of atoms in molecules resulting from rotation about one or more simple bonds
- xvii. **According to pH partition theory, a weakly acidic drug will most likely be absorbed from the stomach because the drug which exist primarily in the**
(a) Un-ionised, more lipid soluble form
(b) Ionised, more water soluble form
(c) Form of weak acid and more soluble in acid media
(d) Ionic form of the drug which facilitates diffusion
- xviii. **Blood flow through a capillary is described by one of the following equations. Choose the correct one**
(a) Langmuir (b) Noyes Whitney
(c) Hildebrand (d) Stokes
- xix. **Ionic mobility is denoted by**
(a) cm/sec (b) Degree celcius/sec
(c) mg/sec (d) None of these
- xx. **A mixture of hydrochloric acid and acetic acid can be titrated satisfactorily by**
(a) Potentiometry (b) Conductometry
(c) Amperometry (d) Spectrophotometry

SECTION-II (Match the Following)

- (c) Potassium hydrogen phthalate solution in glacial acetic acid
 (d) Mercuric acetate in glacial acetic acid

SECTION – II (Match the Following)

2. Match of the following

i. The antibiotics mentioned below are obtained from the organisms listed from [P] to [T]. Match them

- | | |
|---------------|------------------------------|
| 1. Neomycin | [P] Streptomyces fradiae |
| 2. Gentamycin | [Q] Micromonospora purpurea |
| 3. Bacitracin | [R] Streptomyces tenebrarius |
| 4. Tobramycin | [S] Bacillus subtilis |
| | [T] Bacillus polymyxa |

- (a) 1-[P], 2-[R], 3-[Q], 4-[S]
 (b) 1-[Q], 2-[S], 3-[R], 4-[P]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

ii. Given below is a list of medicinal plants. Match them correctly with the list of constituents given in [P] to [T]

- | | |
|-------------------------------|-----------------|
| 1. Holarrhena antidysenterica | [P] Conessine |
| 2. Cymbopogon flexuosus | [Q] Citral |
| 3. Urginea indica | [R] Mucilage |
| 4. Linum usitatissimum | [S] Cocaine |
| | [T] Scillarenin |

- (a) 1-[P], 2-[R], 3-[Q], 4-[S]
 (b) 1-[P], 2-[Q], 3-[T], 4-[R]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

iii. The following drugs are included under the schedules listed in [P] to [T]. Match them

- | | |
|------------------------------------|---------------------|
| 1. Meprobamate | [P] Schedule E |
| 2. Poisonous drugs | [Q] Schedule FF |
| 3. Ophthalmic preparations | [R] Schedule Cand C |
| 4. Biological and special products | [S] Schedule X |
| | [T] Schedule Q |

- (a) 1-[S], 2-[P], 3-[Q], 4-[R]
 (b) 1-[Q], 2-[S], 3-[R], 4-[P]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

iv. Following drugs contain 2 hydroxyl groups each. Nature of these hydroxyl groups are indicated in [P] to [T]. Match them correctly

- | | |
|--------------------|-------------------------------------|
| 1. Morphine | [P] Alcoholic but one 1° another 2° |
| 2. Chloramphenicol | [Q] Alcoholic and both 1° |
| 3. Apomorphine | [R] Both phenolic |
| 4. Cortisone | [S] One alcoholic and one phenolic |
| | [T] Alcoholic but 1° and another 3° |

- (a) 1-[P], 2-[R], 3-[Q], 4-[S]
 (b) 1-[S], 2-[P], 3-[R], 4-[T]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

v. The following drug molecules contain heterocyclic rings listed in [P] to [T]. Match them correctly

- | | |
|------------------|----------------|
| 1. Haloperidol | [P] Pyrimidine |
| 2. Sulphadiazine | [Q] Pyridine |
| 3. Amiloride | [R] Piperidine |
| 4. Pheniramine | [S] Pyrazine |
| | [T] Pyridazine |

- (a) 1-[R], 2-[P], 3-[S], 4-[Q]
 (b) 1-[Q], 2-[S], 3-[R], 4-[P]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

vi. Following drugs exhibit their action by enzyme inhibition. Enzymes are listed in [P] to them correctly

- | | |
|--------------------|------------------------|
| 1. Captopril | [P] β-lactamase |
| 2. Clavulanic acid | [Q] MAO |
| 3. Pargyline | [R] Monooxygenase |
| 4. Methazolamide | [S] Carbonic anhydrase |
| | [T] ACE |

- (a) 1-[R], 2-[P], 3-[S], 4-[Q]
 (b) 1-[T], 2-[P], 3-[Q], 4-[S]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

vii. Following preparations are assayed by biological techniques using the animal or its parts listed in [P] to [T]. Match them correctly

- | | |
|-----------------------|---------------------------|
| 1. Cod liver oil | [P] Sheep blood |
| 2. Heparin injection | [Q] Rabbit |
| 3. Oxytocin injection | [R] Rat |
| 4. Insulin injection | [T] Cat |
| | [S] Anaesthetised chicken |

- (a) 1-[S], 2-[P], 3-[R], 4-[Q]
 (b) 1-[Q], 2-[S], 3-[R], 4-[P]
 (c) 1-[P], 2-[Q], 3-[S], 4-[R]
 (d) 1-[Q], 2-[T], 3-[R], 4-[P]

viii. Following I.P. assays involve the principles listed in [P] to [T]. Match them

- | | |
|------------------------------|--|
| 1. Sodium chloride injection | [P] Titration with N/10 iodine |
| 2. Trimethoprim | [Q] Oxidation involving 2: 6 dichlorophenol indophenol |
| 3. Analgin tablets | [R] Argentometry |
| 4. Ascorbic acid | [S] non-aqueous |
| | [T] Acidimetry |

- (a) 1-[R], 2-[P], 3-[S], 4-[Q]
 (b) 1-[Q], 2-[S], 3-[R], 4-[P]
 (c) 1-[P], 2-[Q], 3-[S], 4-[T]
 (d) 1-[R], 2-[S], 3-[P], 4-[Q]

ix. Given below are some antihypertensive mechanisms. Drugs which are closely associated with these mechanisms of action are listed in [P] to [T]. Match them correctly

- | | |
|--------------------------------|------------------------|
| 1. Ganglion blocking | [P] Methyl dopa |
| 2. Catecholamine depletory | [Q] Hydralazine |
| 3. False neurotransmitter | [R] Reserpine |
| 4. Direct action on arterioles | [S] Mecamylamine |
| | [T] Veratrum alkaloids |

GATE-1990

PART - A Section-I (Choose The Correct Answer)

- 1. Multiple choice question**
- i. Reserpine on hydrolysis gives**
(a) Reserpine acid Methyl alcohol Trimethoxy cinnamic acid
(b) Reserpine acid acetic acid Trimethoxy benzaldehyde
(c) Reserpine acid Methyl alcohol Trimethoxy benzoic acid
(d) Reserpine acid Methyl alcohol - Trimethoxy cinnamaldehyde
- ii. Papaverine is**
(a) 6, 7-dimethoxy-1-(3, 4-dimethoxy benzyl) isoquinoline
(b) 6, 7 dimethoxy-1-(3, 4-dimethyl benzyl) isoquinoline
(c) 6, 7-dimethoxy-1-(3, 4' dimethoxy benzyl) quinolone
(d) 6, 7-dimethoxy-1-(3, 4-dimethyl benzyi) quinolone
- iii. Titanium dioxide is commonly present in**
(a) Vanishing cream (b) Sunscreen cream
(c) Aqueous calamine cream (d) Ophthalmic cream
- iv. Powder ergot when treated with sodium hydroxide solution develops**
(a) A strong odour of ammonia
(b) A strong odour of trimethyl amine
(c) A strong odour of indole
(d) A strong odour of urea
- v. Salbutamol sulphate IP is assayed by**
(a) Direct titration with standard sodium hydroxide solution
(b) Direct titration with standard sodium hydrochloric acid
(c) A known amount of standard acid is added and excess is titrated with standard alkali
(d) Dissolve in glacial acetic acid and titrated with standard perchloric acid using orceins blue
- vi. Heparin prevent blood coagulation by**
(a) Inhibiting thrombin catalyzed conversion of fibrinogen to fibrin
(b) Precipitate blood calcium there by prevent coagulation reactions
(c) Inhibiting enzyme reactions
(d) Converting ionized calcium into chelation
- vii. For the registration of pharmacist in the various states, the Pharmacy Act provide for the constitution of**
(a) Registration tribunals
(b) Registrar of Co-operative societies
(c) Registrar of state pharmacy council
(d) Registrar of central pharmacy council
- viii. Powdered this is dried at temperature**
(a) Not exceeded 60°C (b) 65 °C
(c) 75°C (d) 100 °C
- ix. Prazepam differ in structure from diazepam by**
(a) N-methyl group (b) N-cyclopropyl group
(c) N-cyclopropyl methyl group (d) N-propyl group
- x. The mechanism of action of Rifampicin involve**
(a) Inhibition of bacterial DNA directed RNA polymerase
(b) Inhibition of mycolic acid synthesis
(c) Inhibition of protein synthesis
(d) Inhibition of trans peptidase
- xi. The UV visible region in the electromagnetic spectrum of radiation is**
(a) 200-400 nm (b) 300-660 nm
(c) 400-800 nm (d) 200-800 am
- xii. The Mantoux test uses**
(a) Okt tuberculin (b) Diptheria toxins
(c) Serum antigens (d) Polysaccharide antigens
- xiii. Rutesort is a machine used to sort out**
(a) Coated tablets (b) Filled capsule
(c) Sealed ampoules (d) Sealed containers
- xiv. The volume of distribution of drugs is**
(a) An expression of total body volume
(b) A measure of total fluid volume
(c) A relationship between the total amount of drug in the body and the concentration of the drug in the blood
(d) Proportional to bioavailability of the drug
- xv. Resolution of a spectrophotometer is**
(a) Its wave length range
(b) Its ability to distinguish adjacent absorption bands
(c) Its capacity for its continuous use
(d) Its power to gather light according to source
- xvi. Haloperidol is a major tranquillizer. It belongs to the class of**
(a) Carbamates (b) Propanediol
(c) Butyrophenone (d) Phenothiazine
- xvii. Glandular hair growing having a unicellular or occasionally a short uniserate pedicel with a unicellular or bicellular terminal gland is characteristics of**
(a) Senna leaves
(b) Belladonna leaves
(c) Datura stramonium leaves
(d) Digitalis Purpurea leaves
- xviii. Skeletal muscle relaxation produced by the drug is effectively antagonized by**
(a) Diazepam (b) Succinylcholine
(c) Tubocurarine (d) Aminophylline
- xix. Vitamin D₂ is**
(a) 22, 23-dihydro -5, 6 cis-ergocalciferol
(b) 5, 6 cis- cholecalciferol
(c) 7-dehydrocholesterol
(d) 21, 24-dihydro 5, 6 cis ergocalciferol

xii. Listed in [P] to [T] are some of the analytical constants.

Match them correctly with the drugs given below

- | | |
|---|---------------------|
| 1. A Leafy drug | [P] Total ash value |
| 2. A Bark | [Q] Cineole content |
| 3. Eucalyptus oil | [R] Fibre length |
| 4. A fixed oil having more of unsaturated fatty acid glycerides | [S] Iodine value |
| | [T] Stomatal index |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[T], 2-[R], 3-[Q], 4-[S]
 (d) 1-[R], 2-[Q], 3-[S], 4-[P]

xiii. Match the ingredients listed [P] to [T] with the purpose for which they are used in the formulations

- | | |
|--------------------|---------------------|
| 1. Film coating | [P] Sodium benzoate |
| 2. Syrups | [Q] Ethyl cellulose |
| 3. Emulsification | [R] Eudragit |
| 4. Enteric coating | [S] Sucrose |
| | [T] Sodium oleate |

- (a) 1-[Q], 2-[S], 3-[P], 4-[R]
 (b) 1-[R], 2-[S], 3-[T], 4-[Q]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[R], 2-[Q], 3-[S], 4-[P]

xiv. Match the biological listed under [P] to [T] for the following compounds

- | | |
|--|---|
| 1. 1, 3-Propanediol, 2-methyl 2-propyl Carbamate | [P] Antimalarial |
| 2. 2 Chloro-10[3-(dimethylamino) propyl] Phenothiazine | [Q] Bactericidal to anaerobic and Microaerophilic organisms |
| 3. 5 Nitro-2-furaldehyde semicarbazone | [R] Antibacterial |
| 4. 2 Methyl-5-Nitro Imidazole-ethanol | [S] Relief of anxiety and tension |
| | [T] Tranquilizer |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[T], 3-[R], 4-[Q]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[T], 2-[P], 3-[S], 4-[R]

xv. Given below are the drug [P] to [T] and the ailments for which they are recommended. Match them correctly

- | | |
|----------------------|---|
| 1. Parkinsonism | [P] Methyldopa |
| 2. Hypertension | [Q] Levodopa with decarboxylase inhibitor |
| 3. Nasal congestion | [R] Neostigmine |
| 4. Myasthenia gravis | [S] Phenyl Propanolamine |
| | [T] Ibuprofen |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[Q], 2-[P], 3-[S], 4-[R]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[R], 2-[Q], 3-[S], 4-[P]

xvi. Given below are some of the drugs and their mode action in [P] to [T]. Match them correctly

- | | |
|------------------|---|
| 1. Hydralazine | [P] Vasodilator by direct action |
| 2. Phenothiazine | [Q] Inhibits the Vasoconstrictor and pressor effect of 5 HT |
| 3. Methysergide | [R] Antagonist HT receptor of histamine |
| 4. Tolazamide | [S] Stimulate the islet tissue to secrete insulin |
| | [T] Inhibiting the enzyme carbonic anhydrase |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[P], 2-[R], 3-[Q], 4-[S]

xvii. Given below in [P] to [T] are the names of drugs, appropriate tests are given below for drugs. Match them correctly

- | | |
|--|-----------------------------|
| 1. Alcoholic solution of α -naphthol and Sulphuric acid | [P] Atropine |
| 2. Murexide test | [Q] Reserpine |
| 3. Para-dimethylamino Benzaldehyde | [R] Caffeine |
| 4. Ninhydrin | [S] Gelatin |
| | [T] Triticum sativum powder |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[T], 2-[R], 3-[Q], 4-[S]
 (d) 1-[R], 2-[Q], 3-[S], 4-[P]

xviii. Given below in [P] to [T] are the names of instruments used for the determination of the following. Match them correctly

- | | |
|---------------------------------|--------------------------------------|
| 1. Particle volume | [P] Clarity apparatus |
| 2. Presence of foreign particle | [Q] DuNouy ring |
| 3. Surface tension | [R] Coulter counters |
| 4. Presence of polymorph | [S] Compactor |
| | [T] Differential thermal calorimeter |

- (a) 1-[R], 2-[P], 3-[Q], 4-[T]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[R], 2-[Q], 3-[S], 4-[P]

xix. Choose the correct starting material listed from [P] to [T] for the synthesis of the following drugs

- | | |
|-----------------|---------------------|
| 1. Cortisone | [P] Diosgenin |
| 2. Progesterone | [Q] β -ionone |
| 3. Testosterone | [R] Spirostanol |
| 4. Vitamin A | [S] Sarmentogenin |
| | [T] Anthracin |

- (a) 1-[P], 2-[Q], 3-[R], 4-[S]
 (b) 1-[S], 2-[R], 3-[Q], 4-[P]
 (c) 1-[Q], 2-[R], 3-[P], 4-[S]
 (d) 1-[R], 2-[P], 3-[S], 4-[Q]

xx. Given below are the types of ointment bases. Match them with the correct ointments in [P] to [T]

- | | |
|-----------------------|--------------------------|
| 1. Absorption base | [P] Emulsifying ointment |
| 2. Oleaginous base | [Q] Hydrophilic ointment |
| 3. Emulsion base | [R] Oily cream |
| 4. Water soluble base | [S] Kaolin poultice |
| | [T] Simple ointment |



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