

Duration: 3 Hours

Total marks: 75

- N.B. :** 1. All questions are compulsory
2. Figures to right indicate full marks

Q.1 Choose the appropriate option for following multiple choice based questions. (Write the correct option and the correct answer.) **20**

1. A drug deemed to be _____ as per the Drug and cosmetic act If it is not labelled in the prescribed manner.
 - a) Misbranded drug
 - b) Spurious drug
 - c) Adulterated drug
 - d) Substandard drug

2. Which of the following schedule drugs require an import license in form 10 A
 - a) Schedule X
 - b) Schedule P
 - c) Schedule O
 - d) Schedule M

3. The Schedule H on the label denotes
 - a) To be sold by retail on the prescription of registered medical practitioner only
 - b) Biologicals
 - c) Ophthalmic
 - d) Good manufacturing Practices

4. Who is the *ex officio* member of the DTAB?
 - a) The Director of the central drug laboratory, Kolkatta
 - b) Director of Finance ministry
 - c) Executive member of disaster control team
 - d) Independent director

5. Function of DCC is _____
 - a) To analyse samples sent
 - b) To grant permission for sale of drugs
 - c) To inspect manufacturing premises
 - d) To advice central and state government and DTAB

6. Which of the following drugs are prohibited to manufacture for sale under D and C Act
 - a) Any drug of standard quality
 - b) Drug labelled in prescribed manner
 - c) Any drug with import licence
 - d) Any drug which claims to cure or prevent any disease or ailments specified in schedule J

7. GMP requirements of factory premises and for manufacture of Ayurvedic (including Siddha) and Unani drugs is given in
 - a) Schedule M II
 - b) Schedule M
 - c) Schedule T
 - d) Schedule U

8. If the manufacturer does not hold a separate licence for test, analysis or examination the licence is obtained in _____.
 - a) Form 28
 - b) Form 29
 - c) Form 10
 - d) Form 12

9. Which of the following is a prohibited advertisement?
 - a) Advertisements of magic remedies for the treatment of certain of certain diseases and disorders
 - b) Advertisements by Government
 - c) Leaflets or literature along with packing of drugs
 - d) Therapeutic index published by licenced manufacturer

10. Cannabis means
 - a) Charas
 - b) Opium
 - c) Medicinal preparation
 - d) Manufactured drug

11. Pharmacy act was passed in
 - a) 1978
 - b) 1948
 - c) 1971
 - d) 1955

12. Nominated members of IAEC includes
 - a) Two members of Indian council of medical Research
 - b) Drugs controller of India
 - c) Two Pharmacists
 - d) One member of IPA

13. Restricted preparations are
 - a) Preparations used for hair care
 - b) Capable of being misused as ordinary alcoholic beverages
 - c) Preparations which can be repacked without licence
 - d) Preparations which can be manufactured in absence of excise commissioner

14. The _____ has provided the system facilitating the access to information to every citizen.
- Right to Information act
 - Indian penal code
 - Indian patent act
 - Right to declaration act
15. Health and survey committee was established under chairmanship of _____
- Mr. Jaisukhlal Haathi
 - Sir. Joseph Bhore
 - R. N. Chopra
 - Dr. Mashelkar
16. As per MTP act _____ is mandatory for termination of pregnancy.
- Consent form of Pregnant woman
 - Consent form of relatives
 - Consent form of parents
 - Consent form of in laws
17. Acyclovir comes under _____
- Schedule G
 - Schedule B
 - Schedule J
 - Schedule H
18. Which price is fixed by the Government for scheduled formulations in accordance with the provisions of DPCO 2013?
- Ceiling Price
 - MRP
 - Discounted price
 - Manufacturing cost
19. What is the meaning of “novelty” in relation to a product or a process?
- Not Presented
 - Not published
 - Not performed
 - Non existent
20. Which of the following is the geographical indication property right?
- Sanganeri Hand Block Print
 - Coding programme
 - Paper making
 - Algorithm

Q.2 Answer any two questions

20

- I**
- Define 'Drug' and 'spurious drugs' as per D and C Act 1940 and discuss the classes of drugs which are prohibited for manufacture and sale. **6**
 - Write a note on education regulations and enlist the offences and under Pharmacy Act 1948. **4**

- II** a) Define 'Coca Leaf' under NDPS Act. What are the operations controlled under NDPS act? Enlist any two offences under NDPS Act . **6**
- b) Give the objectives of prevention of cruelty to animals act. Elaborate on procedure to be followed for Performance of experiments on animals **4**
- III** a) Enlist required qualifications for Drug inspector and elaborate on powers and duties of drug inspector as per D and C act 1940. **6**
- b) Discuss the standard operating procedure(SOPs) as per schedule M as given in Drugs and Cosmetic act 1940. **4**
- Q.3 Answer any seven questions. **35****
- I.** Discuss the labelling requirements for drugs other than homoeopathic medicines as per the drugs and cosmetic act 1940. **5**
- II.** What do you mean by Loan licence? Describe the forms and provisions required to issue a loan licence. **5**
- III.** Write note on Schedule N **5**
- IV.** a) Define 'Advertisement' and describe the objective of DMR(OA) Act. **5**
- b) What are the objectives of DPCO 2013 and differentiate between DPCO 1995 and DPCO 2013
- V.** Discuss the recommendations given by the Drug enquiry committee. **5**
- VI.** What ethics a pharmacist should follow in relation to his job and in relation to his/her profession. **5**
- VII.** a) Differentiate between bonded laboratory and non bonded laboratory. **5**
- b) Discuss the provisions made for termination of pregnancy as per MTP Act.
- VIII.** Define the term "Right to Information". What are the duties of public authorities towards the right to information? **5**
- IX.** Define Invention and discuss the inventions which are not patentable as per the provisions of Indian Patent Act. **5**
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Time: 3Hrs.

Marks:75

Q.1. Choose an appropriate option for the following multiple choice based questions. (20M)

1. _____ is a false neurotransmitter and potent vasoconstrictor
 - a. Methyldopa
 - b. Clonidine
 - c. Methyl adrenaline
 - d. Reserpine

2. _____ is the phosphodiesterase 3 inhibitor used in congestive heart failure
 - a. Minoxidil
 - b. Milrinone
 - c. Methamphetamine
 - d. Metoprolol

3. _____ diuretic is preferred to be given with cardiac glycoside to reduce latter's toxicity
 - a. Loop diuretics
 - b. Potassium sparing
 - c. High ceiling diuretics
 - d. Thiazide diuretics

4. Nitrates are used as antianginal drugs as they can
 - a. Reduce preload
 - b. Reduce afterload
 - c. Reduce preload and afterload
 - d. Reduce preload and increase afterload

5. _____ is the most serious complication of anticoagulants
 - a. Hypertension
 - b. Bleeding
 - c. Lethargy
 - d. Insomnia

6. Non-haem iron is best absorbed in the _____ form
 - a. Fe-
 - b. Fe²⁺
 - c. Fe³⁺
 - d. Fe⁴⁺

7. Vasopressin-2 receptors are located primarily on _____
 - a. Smooth muscles
 - b. Platelets
 - c. Collecting duct of kidney and ascending loop of Henle
 - d. Liver

8. Hyperkalemia due to potassium sparing diuretics would be exacerbated by combining it with _____
 - a. Carbonic anhydrase inhibitors
 - b. Thiazide diuretics
 - c. Loop diuretics
 - d. ACE inhibitors

9. Following are the action of Bradykinin EXCEPT

- a. Bronchodilation
- b. Vasodilation
- c. Pain
- d. Increase in vascular permeability

10. Among the disease-modifying antirheumatic medications, _____ provides the fastest symptom alleviation.

- a. Sulfasalazine
- b. Hydroxychloroquine
- c. Methotrexate
- d. Auranofin

11. The following is a selective 5-HT_{1B/1D} receptor agonist:

- a. Buspirone
- b. Ondansetron
- c. Sumatriptan
- d. α -methyl 5-HT

12. _____ enzyme catalyses the conversion of arachidonic acid to prostaglandins

- a. Lipoxygenase
- b. Phospholipase A₂
- c. Cyclooxygenase-1
- d. Cytochrome P450

13. _____ is contraindicated in patients with a history of cardiovascular events.

- a. Ibuprofen
- b. Indomethacin
- c. Diclofenac
- d. Celecoxib

14. _____ is the most appropriate initial oral agent for management of Type-2 diabetes with no comorbid conditions.

- a. Acarbose
- b. Pioglitazone
- c. Sitagliptin
- d. Metformin

15. _____ is used in obstetrics to stimulate uterine contraction and induce labor

- a. Somatostatin
- b. Oxytocin
- c. Prolactin
- d. Vasopressin

16. _____ inhibits thyroid peroxidase which is required in intrathyroidal oxidation of iodide.

- a. Radioactive iodine
- b. Thiocyanates
- c. Propylthiouracil
- d. Nitrates

17. _____ is the naturally occurring female hormone.

- a. Mestranol
- b. Ethinylestradiol
- c. Estrone
- d. Diethylstilbestrol

18. _____ is an anabolic steroid

- a. Oxymetholone
- b. Androstenedione
- c. Dydrogesterone
- d. Pitocin

19. In developing males within the womb, the receptor cells in hypothalamus respond to all EXCEPT

- a. Estrogen
- b. Androgen
- c. Gonadotropins
- d. Testosterone

20. The _____ is a type of biological variation in bioassay

- a. Lack of standardized procedure
- b. Calculative errors
- c. Loss of tissue sensitivity
- d. Improper dilutions of standard solution

Q.2. Long Answers (Answer Any 2 out of 3)

(20M)

1. Enlist antihyperlipidemic. Elaborate on mechanism of action and adverse effect of each class
2. Classify anti-platelet drugs. Give mechanism of action, uses and adverse effects of non-selective irreversible COX inhibitor
3. Classify antirheumatic drugs with examples and give a detailed account on biological agents.

Q.3.Short Answers (Answer 7 out of 9)

(35M)

1. Explain in detail class I antiarrhythmics
2. Comment on dihydropyridines as anti-anginal drugs.
3. Describe plasma volume expanders with examples and give an account on its uses.
4. Give pharmacological actions of 5-HT
5. Write a note on hormones regulating plasma calcium levels
6. Give a detailed account on insulin secretagogues
7. Discuss uses and adverse effects of systemic corticosteroids in detail
8. Give a note on Oral contraceptives
9. Discuss in detail bioassay of vasopressin

Duration: 3 Hours

Total marks: 75

N.B.: 1. All questions are compulsory
2. Figures to right indicate full marks

- Q. I Choose appropriate option for following multiple choice based questions. 20**
- 1 Mevalonic acid pathway is also known as **20**
- Shikimic acid pathway
 - Isoprenoid pathway
 - Tannic acid pathway
 - Amino acid pathway
- 2 Which of the following statement is true for Alkaloids ? **1**
- They are derived from amino acids
 - They are acidic in nature
 - They are all solid in nature
 - They are always easily soluble in water
- 3 Forskolin is obtained from the plant belonging to the family **1**
- Lamiaceae
 - Liliaceae
 - Leguminosae
 - Loganiaceae
- 4 Following crude drug is obtained as a latex from plant source **1**
- Belladonna
 - Opium
 - Rauwolfia
 - Vinca
- 5 Reserpine on first step of hydrolysis gives **1**
- Reserpic acid+Methanol
 - Reserpic acid+Ethanol
 - Methyl reserpate+Trimethoxy benzoic acid
 - Ethyl reserpate+Trimethoxy cinnamic acid
- 6 Podophyllum is drug from class **1**
- Flavone
 - Toxin
 - Lignan
 - Phytotoxin
- 7 Source of Tea leaf is **1**
- Theobroma cocoa*
 - Camelia sinensis*
 - Thuja plicata*
 - Cassia angustifolia*

- 8 Following drug is also used as antiulcer **1**
a Liquorice
b Calotropis
c Cinchona
d Cinnamon
- 9 Anethole has following chemical nature **1**
a Ether
b Ester
c Amide
d Anhydride
- 10 Phenyl propanoid nucleus is present in _____ **1**
a Fenchone
b Menthol
c Eugenol
d Citral
- 11 Following drug belongs to family Leguminosae **1**
a Digitalis
b Dill
c Podophyllum
d Pterocarpus
- 12 Umbelliferone test is given positive by _____ **1**
a Almond
b Asparagus
c Asafoetida
d Ashwagandha
- 13 Abietic acid is present in **1**
a Benzoin
b Myrrh
c Asafoetida
d Colophony
- 14 Amygdalin is identified by **1**
a Bulget Test
b Guignard Test
c Matchstick Test
d Schoenteten Test
- 15 Conversion of C-glycosides to aglycone is possible with _ reaction. **1**
a Simple hydrolysis
b Oxidation
c Reduction
d Oxidative hydrolysis

- 16 Following substance contains peroxide bridge in its structure **1**
 a Atropine
 b Artemisinin
 c Amarogentin
 d Anthraquinone
- 17 Synonym for Taxol is _____ **1**
 a Paclitaxel
 b Cabazitaxel
 c Doxitaxel
 d Docetaxel
- 18 Spectroscopy is interaction between **1**
 a Electromagnetic radiation and matter
 b Electromagnetic radiation and visible rays
 c Electromagnetic radiation and ultra violet rays
 d Electromagnetic radiation and ultra violet-visible rays
- 19 Vinblastine is condensation product of **1**
 a Cantharantine+Caffeine
 b Catharantine+Vindoline
 c Vindoline+Theophylline
 d Carmine+Theobromine
- 20 Electrophoresis is technique for **1**
 a Extraction of Alkaloids
 b Lamination of Aluminium foils
 c Identification of phytoconstituents
 d Separation of DNA, RNA or Proteins

Q. II A Answer any TWO out of THREE **20 M**

1 Answer the following **10 M**

- a. Illustrate various means of Investigations of biogenetic pathways
 b. Write source, structure, isolation, analysis and use of Curcumin

2 Write structure, industrial production and use of the following: **10M**

- a. Atropine
 b. Artemisinin

3 Enlist 4 modern methods of extractions and write note on counter current extraction and pressurized solvent extraction **10M**

Q.II B. Answer any SEVEN out of NINE **35 M**

- 1 Elaborate shikimic acid pathway with names and structures involved in the pathway. **5 M**
 - 2 Write a note on Senna glycosides **5 M**
 - 3 Write source and phytochemistry of Antihypertensive drug **5 M**
 - 4 Give phytochemistry and uses of *Digitalis purpurea* **5 M**
 - 5 What are carotenoids? Write source, chemistry & use of saffron **5 M**
 - 6 What are pseudo alkaloids? Write source, structure, isolation and analysis of caffeine. **5 M**
 - 7 What are terpenoids? Write source, structure, isolation and analysis of menthol. **5 M**
 - 8 Write any five conventional methods of extraction. **5 M**
 - 9 Give a note on principle, procedure and applications of TLC **5 M**
-

Duration: 3 Hours

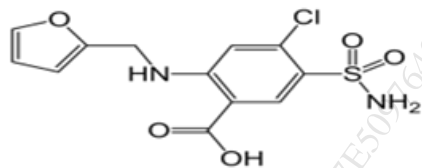
Total marks: 75

- N.B. :** 1. All questions are compulsory
2. Figures to right indicate full marks

Q. 1 Choose appropriate option for following multiple choice based questions. 20 Marks

- 1 Identify the active metabolite of hydroxyzine?
a Astemizole
b Cetrizine
c Loratadine
d Terfenadine
- 2 Cimetidine is synthesized using
a Ethyl-1-chloroacetate
b Ethyl-2-chloroacetate
c Ethyl-3-chloroacetate
d Methyl-2-chloroacetate
- 3 Pantoprazole is
a First generation H₁ antagonist
b H₂ antagonist
c Second generation H₁ antagonist
d Gastric proton pump inhibitor
- 4 Identify the active form of 5-Fluorouracil
a 5-FdUMP
b 5-FUMP
c 5-FUTP
d FdUTP
- 5 Select the non-nitrogen alkylator from the following.
a Chlorambucil
b Melphalan
c Mechlorethamine
d Busulfan
- 6 Mechanism of action of dipyridamol is
a Phosphodiesterase (PDE) inhibitor & vasodilation
b Potassium channel blocker
c Sodium channel blocker
d ACE inhibitor

7 Identify the drug



- a Acetazolamide
- b Cyclothiazide
- c Furosemide
- d Mannitol

8 In 1,4-dihydropyridines class of calcium blockers, replacement of dihydropyridine ring with pyridine ring

- a Increases activity
- b Decreases activity
- c No effect of activity
- d Shows agonistic activity

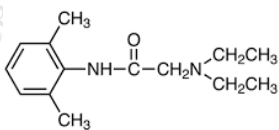
9 One of them is not a prodrug. Identify.

- a Benazepril
- b Captopril
- c Enalapril
- d Quinapril

10 Class III antiarrhythmic agents are

- a Sodium channel blockers
- b Potassium channel activators
- c Sodium channel activators
- d Potassium channel blockers

11 Identify the following drug



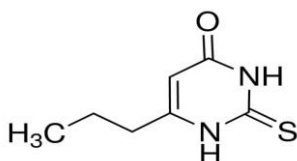
- a Lorcaïnide
- b Lidocaine
- c Tocainide
- d Phenytoin

12 Which of the following drug acts by sequestering bile acid

- a Lovastatin
- b Cholestyramine
- c Clofibrate
- d Bosentan

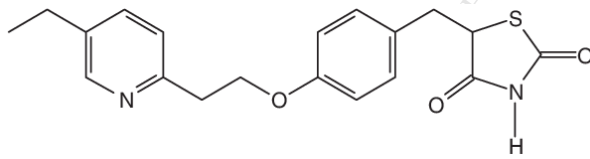
- 13 Digitoxin contains _____
- 6-membered lactone with α,β -unsaturation
 - 5-membered lactone with α,β -unsaturation
 - 6-membered lactone with conjugated double bond
 - 5-membered lactone with conjugated double bond
- 14 Arrange the following in increasing order of glucocorticoid activity
 I)Prednisolone II)Prednisone III)Methyl prednisolone IV) Hydrocortisone
 Choose the correct option
- I>II>III>IV
 - III>II>I>IV
 - III>I>II>IV
 - I>III>II>IV
- 15 Estrogen to 4-methylestrogen metabolism occurs by action of
- 16 α hydroxylase
 - 17 α hydroxylase
 - estrogen 4-hydroxylase and COMT
 - 5 α reductase

- 16 Identify the drug



- L-Thyroxine
 - Propylthiouracil
 - Tadalafil
 - Slidenafil
- 17 Following is an example of an antiprogestin
- Mifepristone
 - Nandrolone
 - Levonorgestrel
 - Diethylstilbesterol

18 Identify the drug



- a Tolbutamide
- b Pioglitazone
- c Acrabose
- d Repaglinide

19 Following statement is wrong about meglitinides

- a It is a non - sulphonylurea benzoic acid derivative
- b It shut down ATP sensitive potassium channel
- c It is an insulin secretagogue
- d It is α glucosidase inhibitor

20 Which of the following drug is of aminobenzoic acid derivative?

- a Meprylcaine
- b Mepivacaine
- c Butambane
- d Dibucaine

I. Long Answers (Answer any 2 out of 3)

20 Marks

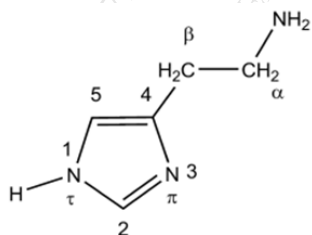
Q1

A. Show what happens to omeprazole in strongly acidic environment and explain how this is related to mechanism of action? Depict the activation of omeprazole?

4 Marks

B. Answer following with respect to given structure.

4 Marks



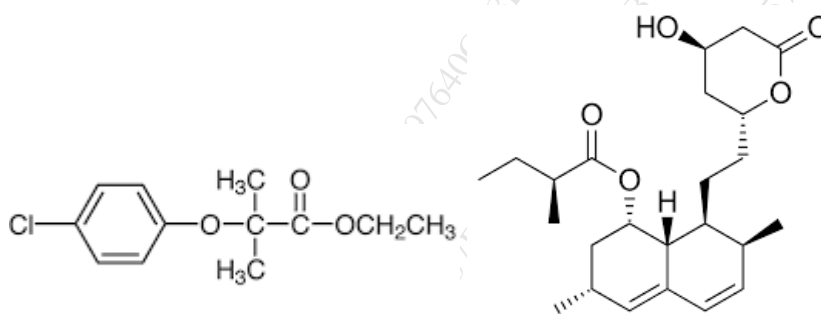
- a) Identify this structure.
- b) Comment on its activity at the H_1 and H_2 receptor.
- c) Predict the effect of the following structural changes on its activity:
 - i. Introduction of a CH_3 group at position 5.
 - ii. Replacement of α -amino group by a guanidino group.

C. Mention three structural characteristics of 2nd generation H_1 antagonist that make them superior to 1st generation H_1 antagonist.

2 Marks

Q2 A. Answer the following

4 Marks



(a)

(b)

1. Identify the prodrug/s from the above structures and show its activation
2. Elaborate the mechanism of action of (b)

4 Marks

B. Give the development of sulphhydryl containing ACE inhibitor

C. Explain the mechanism of action of Class III antiarrhythmic agents

2 Marks

Q3

A. Draw the structure of estradiol and give its chemical name.

4 Marks

What is the effect of the following on activity

- i) Addition of hydroxyl group at 6,7,11 positions
- ii) Substitution of 17 α with ethynyl group

B. Write a note on insulin preparation. Highlight the structural difference from human insulin.

4 Marks

C. Explain the mechanism of action of local anesthetics.

2 Marks

II. Short Answers (Answer 7 out of 9)

35 Marks

Q1 Explain the mechanism of action of alkylating agents. Support your answer with relevant chemical reactions..

5 Marks

Q2 a. Write the chemical classification of calcium channel blockers. Give one example along with the structure from each class.

3 Marks

b. Classify the following antihypertensive drugs into mechanistic classes: Hydralazine, Reserpine, sodium nitroprusside, Quinalapril

2 Marks

Q3 A. Match the following

3 Marks

	Name of drug		Chemical moiety		Mechanism of action
1	Warfarin	A	Naphthoquinone	i	Inhibits the vitamin K-mediated gamma-carboxylation of precursor proteins
2	Anisindione	B	1,3-indandione	ii	Prothrombin activator
3	Menadione	C	Coumarin	iii	Inhibits platelet aggregation
		D	Thienopyridine	iv	Vitamin K reductase inhibitor

- B. Explain the mechanism of action of Nesiritide and mention its therapeutic use. **2 Marks**
- Q4** What are anabolic steroids. Give any four structural features that enhance anabolic activity of steroids. Support your answer with relevant examples. **5 Marks**
- Q5** Discuss the SAR of local anaesthetic activity giving relevant examples **5 Marks**
- Q6** a) Give the structure & explain MOA of minoxidil. **3 Marks**
b) Give the effect of following substitution on activity when o,o-dichloro substituent in clonidine is replaced by o,o-dimethyl substitution. **2 marks**
- Q7** a) Outline the chemical synthesis of Benzocaine with reagents and reaction conditions **3 Marks**
b) Give an example of pyrazolopyrimidine containing drug which is used for treatment of erectile dysfunction & describe its mechanism of action. **2 Marks**
- Q8** a) Applying the principles of organic chemistry, predict the synthesis of isosorbide dinitrate, depicting the reagents and reaction conditions involved. **3 Marks**
b) Give the structure & use of promethazine. **2 Marks**
- Q9** a) Write synthesis of disopyramide depicting the reagents and reaction conditions involved. **3 Marks**
b) Sotalol is a dual acting antiarrhythmic agent. Justify **2 Marks**

Duration: (3 hours)

[Total Marks: 75]

- N.B.:**
1. All questions are compulsory.
 2. Draw neat and well labeled diagrams wherever necessary.
 3. Figure to the right indicate full marks.

Q.1. Multiple Choice Questions (MCQs)

20M

1. Content Uniformity test is applicable especially when drug content is _____ of the total tablet or capsule weight.
 - a. less than 10 mg or 10%
 - b. less than 20 mg or 20%
 - c. more than 10 mg or 10%
 - d. more than 20 mg or 20%
2. Arching and rat-holing are problems associated with _____ of powder blend.
 - a. non-uniform drug mixing
 - b. weight variation
 - c. poor flow properties
 - d. poor mixing
3. Which of the following step is not a part of wet granulation?
 - a. Slugging
 - b. Blending
 - c. Milling
 - d. Wet massing
4. Collection of wax on a sugar-coated tablet is called as _____.
 - a. Marbling
 - b. Orange peel effect
 - c. Blooming
 - d. Sticking-Picking
5. Ozone depletion is the main drawback of _____propellants.
 - a. Hydrocarbons
 - b. Chlorofluorocarbons
 - c. Compressed gases
 - d. Hydrogenated gases
6. The hydrolytic resistance of type II glass is increased by treating it with_____.
 - a. Sulphur
 - b. Phosphorous
 - c. Freon
 - d. Sodium
7. Oil and water phase are mixed at 70°C in the manufacturing of a _____.
 - a. cream
 - b. shampoo

- c. toothpaste
 - d. lipstick
8. Type A gelatin is obtained by _____ of dry bones or skin.
- a. Acid treatment
 - b. Alkaline treatment
 - c. Ester hydrolysis
 - d. Amide hydrolysis
9. The ability of a compound to crystallize in multiple forms is known as _____.
- a. Anisotropy
 - b. Polymorphism
 - c. Polymerization
 - d. Racemization
10. Identification test for emulsion is _____
- a. Re-dispersibility test
 - b. Dilution test
 - c. Particle size changes
 - d. Sedimentation volume
11. _____ density gives estimate of interparticle pores and void spaces.
- a. Bulk
 - b. Tapped
 - c. True
 - d. Apparent Bulk
12. pKa determination helps in analysing _____ of a drug.
- a. percent ionized and unionized fraction
 - b. percent water and lipid soluble component
 - c. Surface charge
 - d. Solid and solution state stability
13. Distillation is one of the methods of preparation of _____
- a. Water for Injection
 - b. Emulsion
 - c. Eye drop
 - d. Ear drops
14. The following route of administration gives 100% bioavailability.
- a. Intradermal
 - b. Intramuscular
 - c. Subcutaneous
 - d. Intravenous

15. In freeze drying process, moisture is removed by a process of -
- Sublimation
 - Congeaing
 - Evaporation
 - Crystallization
16. Injection of a highly hypertonic solution can lead to ____
- Shrinkage of blood cells
 - Bursting of blood cells
 - No effect on cells
 - Reduction in the plasma volume
17. Which of the following plasticizer is preferred in capsule manufacturing?
- Lactose
 - PVP
 - PEG
 - Sorbitol
18. Identify the incorrect step in manufacturing of empty hard gelatin capsule shells.
- Coating
 - Dipping
 - Spinning
 - Trimming
19. One of the following physical forms of a drug shows rapid dissolution and absorption *in vivo* as compared to others-
- Crystalline
 - Hydrous
 - Amorphous
 - Mixed
20. Which gram-negative bacteria is generally found to be present in ophthalmic products?
- Escherichia coli*
 - Pseudomonas aeruginosa*
 - Staphylococcus aureus*
 - Streptococcus pneumoiae*

Q.2. Answer any 2 questions.

2 x 10 = 20M

1. Enlist merits and demerits of tablets. Write a note on excipients used in tablets.
2. Provide a comprehensive explanation of the production facilities used in the manufacturing of parenteral products.
3. Discuss drug-excipient compatibility studies and solid-state stability studies done during preformulation stage of drug development.

Q.3. Answer any 7 questions.

7 x 5 = 35M

1. Describe evaluation of parenteral suspensions.
2. Write a short note on ophthalmic ointment bases.
3. Explain steps in sugar coating of tablets.
4. Elaborate on two phase and three phase system in aerosols.
5. Write in brief about blister packaging of solid unit dosage forms.
6. Justify importance of polymorphism studies in preformulation.
7. Discuss all the ingredients used in the formulation of a lipstick.
8. Explain QC tests for hard gelatin capsules as per IP.
9. Elaborate on the glass containers used in parenterals and discuss tests to distinguish between them.
