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## B. Pharmacy (Third Semester) Examination, April-May 2020/NOV-DEC 2020

### (PCI Scheme)

### (Pharmacy Branch)

### PHARMACEUTICAL ORGANIC CHEMISTRY-II

### (Theory : BP301T)

### *Time Allowed : Three hours*

### *Maximum Marks : 75*

*Note : Question paper is of three parts i.e. Part A, B and C. Part A consist of 20 MCQ's each of 1 mark. All questions are compulsory. Part B consists of 3 long answer questions of which attempt any **two**. Each of 10 marks. Part C consists of 9 short answer questions, attempt any **seven** question. Each of 5 marks.*

## Part-A

### (Multiple Choice Questions)        20×1=20

1. (i)  Which of the following statements are false about
        benzene :

    (a)  It is planar molecule with bond angle 120°

    (b)  It is immiscible with water forming the lower layer.

    (c)  It can be converted into cyclohexane by
         hydrogenation at 200°C in presence of Ni
         catalyst.

    (d)  It reacts with ethyl chloride in the presence
         of aluminium chloride to form ethyl benzene.

   (ii)  Carbon atom in a Benzene ring are :

    (a)  SP hybridized

    (b)  $SP^3$ hybridized

    (c)  $SP^2$ hybridized

    (d)  None of these

   (iii) Toluene undergoes oxidation to give :

    (a)  Benzyl alcohol

    (b)  Quinone

    (c)  Benzaldehyde

    (d)  Benzoic acid

   (iv)  Cresol on distillation with zinc dust gives :

    (a)  O-xylene

    (b)  Benzene

    (c)  O-plus-P-Xylene

    (d)  Toluene

   (v)  Aniline is produced by :

    (a)  The reaction of benzene with Ammonia

    (b)  The reaction of nitrobenzene with Sn/HCl

    (c)  The dehydrogenation of nitrobenzene

    (d)  The reaction of nitrobenzene with $I_2$/NaOH

   (vi)  Aniline react with acetic anhydride to give :

    (a)  N-methylation

    (b)  P-Aminoacetophenone

    (c)  Acetanilide

    (d)  m-Aminoacetophenone

(vii) Which of the following is least basic :

   (a)   Aniline

   (b)   p-nitroaniline

   (c)   Ammonia

   (d)   Trimethyl amine

(viii) Benzene undergoes Friedal-Craft reaction with isopropyl alcohol in presence of $H_2SO_4$ catalyst to give :

   (a)   n-proyl benzene

   (b)   Benzophenone

   (c)   Isopropyl benzene

   (d)   Benzaldehyde

(ix) Which of the following is the best choice of reagent to effect the electrophillic iodination of an aromatic ring :

   (a)   KI, acetone

   (b)   $I_2$, $CH_3CN$

   (c)   KI, $HNO_3$,

   (d)   $I_2$, $HNO_3$

(x) Benzene react with chlorine in presence of $FeCl_3$ catalyst to form :

   (a)   Hexachloro benzene

   (b)   Chlorobenzene

   (c)   Hexa chloro cyclohexane

   (d)   Benzyl chloride

(xi) Sodium or potassium salt of fatty acids are called:

   (a)   Terpenes

   (b)   Soaps

   (c)   Carbohydrates

   (d)   Proteins

(xii) Soap can not used in Hard water beoause they ...

   (a)   Contain Sodium

   (b)   Create environmental problems

   (c)   are too greasy

   (d)   Form precipitates

(xiii) Liquid oils can be converted to solid fats by :

   (a)   Hydrogenation

(b) Saponification

(c) Hydrolysis

(d) Oxidation of double bond

(xiv) Fats and oils are :

(a) Monoesters of glycerols

(b) Diesters of glycerol

(c) Triesters of glycerols

(d) Diesters of Tritenperiod

(xv) Which of the following contains a planar ring of carbon atom :

(a) Cyclohexane

(b) Cyclobutane

(c) Cyclopentane

(d) Cyclopropane

(xvi) Which of the following compounds will give cyclopropane on treatment with sodium in dry ether :

(a) 1, 3-Dibromo propane

(b) 1, 1-Dibromo propane

(c) 1, 2-Dibromo propane

(d) 2, 2-Dibromo propane

(xvii) Cyclobutane reacts hydrogen in the presence of nickel catalyst at 200°C to give :

(a) butane

(b) 1-Butene

(c) 2-Butene

(d) None of these

(xviii) The bond angle between carbon atoms in cyclohexane is :

(a) 60°

(b) 90°

(c) 109·5°

(d) 120°

(xix) The most stable conformation of cyclohexane is the :

(a) Haworth form

(b) Boat form

(c) Newman form

(d) Chair form

(xx) Cyclopropane reacts with concentrated HBr to give :

(a) 1-Bromo propane

(b) Bromocyclo propane

(c) 2-Bromo propane

(d) 1, 2-Dibromo propane

## Part-B

### (Long Answer Type Questions) 2×10=20

2. Discuss the mechanism involved in Friedel-craft reaction.

3. Explain the effect of substituents on the acidic character of phenols.

4. Explain in details about the Baeyer Strain theory and also mention it's limitations.

## Part-C

### (Short Answer Type Questions) 7×5=35

5. Describe briefly about resonance of Benzene.

6. Why Amines are basic in nature?

7. Discuss Qualitative test of phenols.

8. Write a note on iodine value.

9. Discuss molecular orbital structure of Naphthalene.

10. Explain why $\alpha$-position of naphthalene is more reactive then $\beta$-position

11. What do you understand by Clemmensen reduction?

12. What is Diazotisation reaction?

13. Write the addition reactions of cyclopropane.

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## B. Pharmacy (Third Semester) Examination, April-May 2020 / NOV-DEC 2020

### (PCI Scheme)

### (Pharmacy Branch)

### PHYSICAL PHARMACEUTICS-I

### THEORY (BP302T)

### *Time Allowed : Three hours*

### *Maximum Marks : 75*

*Note : Question paper contains 3 parts namely Part A, Part B and Part C. Attempt all questions in Part A. Attempt any two questions in Part B. Attempt any seven question in Part C. Each question in Part A is of 1 mark. Each questions in Part B is of 10 marks. Each question in Part C is of 5 marks.*

### Part-A                                      1×20=20

*Note : Attempt all questions.*

1.  Multiple Choice Questions :

[ 2 ]

(i) The phenomenon in which substance exists in more than one crystalline forms is known as :

(a) Crystallinity

(b) Anisotropy

(c) Polymorphism

(d) Polycrystallinity

(ii) The change of state from a solid directly to a gas is known as :

(a) Evaporation

(b) Sublimation

(c) Fusion

(d) Boiling

(iii) An example of Eutectic mixture is :

(a) Sodium chloride and Potassium chloride

(b) Menthol and Thymol

(c) Magnesium carbonate and sodium chloride

(d) Benzoic acid and Magnesium chloride

(iv) Which of the following method/equipment is not used for determining the particle size distribution of pharmaceutical powders :

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[ 3 ]

(a) Andreason pipette

(b) Seiving method

(c) Differential scanning calorimeter

(d) Optical microscopy

(v) an angle of repose ............ ($\angle 25°$) of the granules indicates :

(a) Very poor flow

(b) Good flow

(c) Excellent flow

(d) Poor flow

(vi) Porosity of a porous powder can be defined as :

(a) Bulk volume/Void volume

(b) Void volume/Bulk volume

(c) True volume/Bulk volume

(d) Bulk volume/True volume

(vii) Which of the following is a chelate :

(a) Cisplatin

(b) Haemoglobin

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(c) Povidone Iodine

(d) Ferrocene

(viii) EDTA is an example of :

(a) Unidentate ligand

(b) Bidentate ligand

(c) Tetradentate ligand

(d) Hexadentate ligand

(ix) In a metal in complex, the metal ion and ligand are respectively :

(a) Lewis acid and base

(b) Lewis base and acid

(c) Nucleophile and Electrophile

(d) Donor and Acceptor

(x) pH is :

(a) Log of $H^+$ concentration

(b) Negative log of $H^+$ concentration

(c) Log of $OH^-$ concentration

(d) Negative log of $OH^-$ concentration

(xi) β -cyclodextrin increase the solubility of poorly soluble drugs by :

(a) Chemical modification

(b) Inclusion complexation

(c) Solubilisation

(d) Cosolvency

(xii) pH of a pharmaceutical buffer system can be calculated by :

(a) Noyes Whitney equation

(b) Henderson Hasselbalch equation

(c) pH partition theory

(d) Michaelis Menten equation

(xiii) Buffer solution :

(a) Resist change in pH

(b) Decrease the pH of a solution

(c) are strong bases

(d) increase the pH of a solution

(xiv) Buffer index can be defined as the ratio of the increment of strong base (or acid) to the :

(a)    Hypotonic solution

(b)    Isotonic solution

(c)    Hypertonic solution

(d)    Change in pH

(xv)   Cosolvency is :

    (a)    Increasing the solubility of a drug by adding another solvent

    (b)    Decreasing the solubility of a drug

    (c)    Increasing the solubility of a drug in water in the presence of additives

    (d)    No change in solubility of a drug

(xvi)  Solubility of most gases usually with increase in temperature :

    (a)    Increases

    (b)    Decreases

    (c)    Does not change

    (d)    First increases then decreases

(xvii) Which of the following equations is used to represent drug dissolution from a tablet :

    (a)    Fick's equation

(b)    Noyes Whitney equation

(c)    Henderson Hasselbalch equation

(d)    Michaelis Menten equation

(xviii) Sorensen's pH scale starts from :

    (a)    Zero

    (b)    One

    (c)    Seven

    (d)    Fourteen

(xix)  Buffer equation is also known as :

    (a)    Michaelis Menten equation

    (b)    Fick's law

    (c)    Henderson Hasselbalch equation

    (d)    None of these

(xx)   Refractive index ($n$) is equal to :

    (a)    $\dfrac{\text{speed of light in vacuum}}{\text{speed of light in medium of greater density}}$

    (b)    $\dfrac{\text{speed of light in denser medium}}{\text{speed of light in lighter medium}}$

(c)   Both of the above

(d)   None of the above

## Part-B                              2×10=20

### (Long Answer Questions)

*Note :    Answer any **two** questions from Part-B. All questions carry equal marks.*

2.   Define Solubility. Describe ideal and real solutions. What are the various factors infleuncing solubility of drugs?

3.   Enumerate various methods of determination of particle size. Explain optical microscopy method in detail.

4.   Define Complexation. Give its classification and pharmaceutical applications. How binding of drugs to proteins can influence the drug action?

## Part-C                              7×5=35

### (Short Answer Questions)

*Note :    Answer any **seven** questions from Part-C. All questions carry equal marks.*

5.   Describe the influence of partition coefficient on the drug absorption and drug action.

6.   Define critical solution temp, azeotropic mixtures and eutectic mixtures.

7.   What are liquid crystals? Give its classification with examples.

8.   Describe the factors affecting how of powders? Define angle of repose.

9.   Describe the principle of electrometric method or colourimetric method for pH determination.

10. Define Aerosols. Give its advantages and disadvantages along with applications.

11. Differentiate between isotonic, hypertonic and hypotonic solutions. Describe any one method for adjusting tonicity of a solution.

12. Enumerate different methods of analysis of complexes. Explain any one method in detail.

13. Define the following :

    (a)  Boiling point

    (b)  Melting point

    (c)  Freezing point

    (d)  Dipole moment

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## B. Pharmacy (Third Semester) Examination, April-May 2020/ NOV-DEC 2020

### (PCI Scheme)

### (Branch : Pharmacy)

## PHARMACEUTICAL MICROBIOLOGY

### [ Theory (BP303T) ]

### *Time Allowed : Three hours*

### *Maximum Marks : 75*

***Note :*** *This question paper contains three parts (a), (b) and (c). Part (a) contains 20 MCQs of 1 marks each. All questions are compulsory in part (a). Part (b) contains 3 long answer questions of 10 marks each. Attempt any two question from part (b) and part (c) contains 9 short answer questions each of 5 marks. Attempt any 7 questions from part (c).*

1. **Multiple Choice Questions :**          20×1=20

   (i)    Biological indicator used for validation of membrane filtration is ................

(a) Pseudomonas diminuta

(b) Bacillus pumilis

(c) Bacillus stearo thermophilous

(d) Bacillus subtilis

(ii) A compound microscope equipped with 10 X eyepiece and adjusted to oil immersion objective, then the total magnification of that microscope is :

(a) 100 X

(b) 10 X

(c) 1000 X

(d) All of the above

(iii) In phase contrast microscope, hollow beam of light is formed due to :

(a) Annular plate

(b) Phase shift plate

(c) Excitation filter

(d) Barrier filter

(iv) The chemical is responsible for solification of culture media :

(a) Fluid thioglycolate

(b) Nutrient broth

(c) Agar

(d) Soyabean casein

(v) Dark image against bright background is formed in :

(a) Dark field microscope

(b) Bright field microscope

(c) Phase contrast microscope

(d) None of the above

(vi) Microbial assay of Amikacin is done using of :

(a) Staphylococcus aurous

(b) Sacchromyces cerevicea

(c) Bacillus pumilus

(d) Bacillus subtilisa

(vii) The disinfectant has ability to kill spores :

(a) Chlorine

(b) Phenol

(c) Iodine

(d) Silver

(viii)  Oil should not be sterilized by

(a) Moist heat sterilization

(b) Dry heat sterilization

(c) Radiation sterilization

(d) Gaseous sterilization

(ix)  Methylene blue is a :

(a) Acidic strain

(b) Negative strain

(c) Basic strain

(d) Differential strain

(x)  Which of the following is not a virus :

(a) Polio

(b) Herpes

(c) Rabies

(d) Vibrio cholera

(xi)  Bacteria that grow at temp. as high as 55° C are :

(a) Thermophiles

(b) Mesophiles

(c) Psychophiles

(d) Auxophiles

(xii)  The best medium for the production of Penicillin is :

(a) Surface waste liquor

(b) Nutrient agar

(c) Corn sleep agar

(d) Whey

(xiii)  The medium used in Membrane filter technique was :

(a) EMB agar

(b) EMR-VP medium

(c) Lactose Broth

(d) Endo agar

(xiv)  Lysol is a :

(a) Disinfectant

(b) Sterilant

(c) Antiseptic

(d) Antifungal

(xv) Endotoxin produced by gram-ve bacteria is present in :

(a) Peptidoglycan

(b) Lipopolysaccharides

(c) Theichoic acid

(d) Inner-membrane

(xvi) Yeast extract is an excellent source of :

(a) Vitamin A

(b) Proteins

(c) Carbohydrates

(d) Vitamin B

(xvii) Enzymes are chemically :

(a) Proteins

(b) Lipids

(c) Carbohydrates

(d) None of the above

(xviii) Which of the following method of sterilization has no effect on spores?

(a) Hot air oven

(b) Drying

(c) Autoclave

(d) None of the above

(xix) In a antigen, haptens are

(a) Antigenic

(b) Immunogenic

(c) Non-immunogenic

(d) None of the above

(xx) Which of the following is ionising radiation?

(a) UV rays

(b) X-rays

(c) Gamma rays

(d) None of the above

2. **Long answer type questions (Answer 02 out of 03) :** 2×10=20

(i) Write a detailed note on sterility testing of pharmaceutical products.

(ii) Describe in detail the structure of bacterial cell with the help of neat and labelled diagram.

   (iii) Discuss about different staining techniques used for indentifiation of bacteria.

**3. Write short note : (Answer 07 out of 09)**     7×5=35

   (i)    Scope of Microbiology.

   (ii)   Microbial assay of antibiotic.

   (iii)   Laminar air flow.

   (iv)   Evaluation of microbial stability of pharmaceutical formulations.

   (v)   Evaluation of Bacteriodal and Bacteriostatic agent.

   (vi)   Designing of aseptic area.

   (vii)   Sterility indicators.

   (viii)   Growth curve.

   (ix)   Sources and types of microbial contaminants.

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## B. Pharmacy (Third Semester) Examination, April-May 2020/NOY-DEC2020

### (PCI Scheme)

### (Pharmacy Branch)

### PHARMACEUTICAL ENGINEERING

### THEORY (BP304T)

*Time Allowed : Three hours*

*Maximum Marks : 75*

*Note : Attempt any **twenty** questions from Section-A. Attempt any **two** questions from Section-B and **seven** questions from Section-C.*

### Section-A

### (Multiple Choice Questions)        1×20=20

*Note :     Attempt any **twenty** questions. Each question carries 1 mark.*

1.  Choose the correct answer :

    (i)     If Reynolds Number, Re<2000, indicates flow is :

(a)    Laminar

(b)    Turbulent

(c)    Transient

(d)    All of the above

(ii)    Ball Mill is work on :

(a)    Attrition

(b)    Impact

(c)    Cutting

(d)    Both (a) and (b)

(iii)    Which of the following is not theory of corrosion :

(a)    Acid theory of corrosion

(b)    Chemical theory of corrosion

(c)    Galvanic theory of corrosion

(d)    Bronsted theory of corrosion

(iv)    In Ball Mill, maximum size reduction is obtained at :

(a)    Low speed

(b)    Medium speed or Critical speed

(c)    Very high speed

(d)    High speed

(v)    The process in which heavier component in mixture settles down when water is added to it is called :

(a)    Sedimentation

(b)    Filtration

(c)    Condensation

(d)    Evaporation

(vi)    Metal used for construction of sieve is :

(a)    Stainless steel

(b)    Nylon

(c)    Terlene

(d)    Magnesium

(vii)    The stress and strain rule is given by :

(a)    Young's module

(b)    Kicks law

(c)    Bonds law

(d)    Rittinger's law

(viii) Which of the following factors affects size reduction?

    (a)   Hardness

    (b)   Toughness

    (c)   Abrasiveness

    (d)   All of the above

(ix) According to the Fluid Statics the pressure is denoted as :

    (a)   pgh

    (b)   ngh

    (c)   drh

    (d)   hAg

(x) Which of the following factor influence rate of filtration :

    (a)   Area of the filter surface

    (b)   Pressure drop

    (c)   Viscosity of filtrate

    (d)   All of the above

(xi) In which of the following dryer, atomizers are used :

    (a)   Tray dryer

    (b)   Spray dryer

    (c)   Roller dryer

    (d)   Freeze dryer

(xii) Which of the following is suitable mixing equipment for two immiscible liquids?

    (a)   Silver Son Emulsifier

    (b)   Double cone blender

    (c)   Ribbon blender

    (d)   Twin shell blender

(xiii) The process of separation of insoluble particles from suspension or slurry is called :

    (a)   Filtration

    (b)   Sieving

    (c)   Distillation

    (d)   Drying

(xiv) The filter aids are added to the liquid :

    (a)   To increase the porosity

    (b)   To increase the permeability

    (c)   Both (a) and (b)

    (d)   None of the above

(xv) The process in which centrifugal force is used as driving force for phase separation is called :

(a) Centrifugation

(b) Filtration

(c) Evaporation

(d) Distillation

(xvi) Substances containing bound water are called :

(a) Hygroscopic subs

(b) Non Hygroscopic subs

(c) Efflorescent subs

(d) Deliquescent subs

(xvii) In which of the following dryer, atomizers are used :

(a) Tray dryer

(b) Spray dryer

(c) Roller dryer

(d) Freeze dryer

(xviii) Which of following factors do not affect rate of evaporation :

(a) Temperature of the liquid

(b) Humidity

(c) Depth of the liquid

(d) Surface of the liquid

(xix) The rate of evaporation increases if surface area of liquid is :

(a) Large

(b) Small

(c) Moderate

(d) None of the above

(xx) Vaccum Distillation occur at :

(a) Temp below its boiling point

(b) High Boiling point

(c) High temp

(d) High atm pressure

(xxi) When the difference between the volatilities of two components is very large then which of the following distillation method is used?

(a) Flash Distillation

(b) Vaccum Distillation

(c)    Steam Distillation

(d)    Molecular Distillation

(xxii) The enzymes, vitamins, glycoside and alkaloids are extracted by :

(a)    Steam Distillation

(b)    Distillation under reduced pressure

(c)    Flash Distillation

(d)    Vaccum Distillation

(xxiii) The process of decomposition or destruction of metallic material in process of environment through chemical reaction is called :

(a)    Corrosion

(b)    Degradation

(c)    Deposition

(d)    Deterioration

## Section-B

### (Long Answer Type Questions)    2×10=20

*Note  :    Attempt any two questions. Each question carries 10 marks.*

2.  Derine drying with its principle and explain the working, principle and construction of fluidized bed dryer.

3.  Define evaporation with principle, working and construction of film evaporator.

4.  Define size reduction with its principle and explain the working, principle and construction of ball mill.

5.  Define flow meters with principle, working and construction of orifice meter in detail.

### Section-C

### (Short Answer Type Questions)    7×5=35

*Note  :    Attempt any **seven** questions. Each question carries 5 marks.*

6.  Describe theory of crystallization with principle and application of swenson walker crystallizer.

7. Explain filtration in detail with working and construction of plate and frame filter.

8. Discuss the corrosion with its prevention.

9. Discuss industrial hazards in detail.

10. Describe heat transfer mechanism with Fourier's law in detail.

11. Describe the factors affecting during materials selected for pharmaceutical plant construction.

12. Describe size separation with official standards of powder.

13. Explain the principle, working and applications of Perforated Basket Centrifuge.

14. Describe the principle, working and applications of Silver Son Emulsifier.

15. Describe the Reynolds number with its significance.

16. Describe Bernoulli's theorem and its applications.