



UNIVERSITY OF THE PUNJAB

First Prof. A/2015

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutics-I (Physical Pharmacy)

PAPER: 3 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

Sr.No.	Questions	Marks
Q.No.1	a. What are the colligative properties of the solutions? Explain it with reference to depression in freezing point and osmotic pressure?	15
	b. Explain the term Molarity and Normality?	05
Q.No.2	a. Define emulsion and describe different tests for the identification of an emulsion system?	10
	b. What is Stoke's equation, explain different factors effecting rate of sedimentation of particles of internal phase in a disperse system?	10
Q.No.3	a. Define colloids. Enlist various types of colloidal dispersion citing example.	05
	b. Explain preparation and stability of colloids.	15
Q.No.4	a. Define simple distillation. Explain its basic principle and theory with its applications in pharmacy.	12
	b. Differentiate between steam distillation and distillation under reduced pressure.	08
Q.No.5	a. Explain the Newton's law of flow with help of diagram and equation.	10
	b. Define the term Thixotropy. Explain its importance in non-Newtonian systems.	10
Q.No.6	a. What is the buffer action? Explain Henderson- Hasselbalch equation of acidic buffers?	10
	b. What is the pH curve? Explain titration curves for strong acid VS strong base and weak acid VS strong base?	10
Q.No.7	Write a note on the following. a. Desiccation b. Micellar Solubilization c. Sublimation d. Retail Pharmacy	(05 each)



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TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q.1. (a) Define Raoult's law for ideal and non ideal solutions. What are applications of solution in pharmacy? (12)
(b) Explain surface tension and adsorption? (8)
- Q.2. (a) Define suspension and differentiate between flocculated and deflocculated suspension? (10)
(b) Define emulsion. Give various types of emulsion. What are applications of emulsions in pharmacy? (10)
- Q.3. (a) Define colloids. Enlist various types of colloidal dispersion citing example. (5)
(b) Explain kinetic and optical properties of colloids. (15)
- Q.4. (a) What are methods of crystallization and discuss applications of crystallization in pharmacy? (12)
(b) Explain principle and applications of vacuum distillation. (08)
- Q.5. (a) Explain lyophilization. What are advantages and disadvantages of lyophilization? (12)
(b) Discuss in detail the particle size and size distribution of powders. (08)
- Q.6 (a) Explain the Newton's law of flow with help of diagram and equation? (10)
(b) Define the term Thixotropy. Explain its importance in Non Newtonian systems. (10)
- Q.7 Write a note on the following (5 each)
- (a). Exciccation
 - (b). Hydrolysis
 - (c). Solubilization
 - (d). Hospital pharmacy



UNIVERSITY OF THE PUNJAB

First Prof. 2nd A/2016

Examination:- Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutics-I (Physical Pharmacy)

PAPER: 3 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q.1. (a) What are solutions? Describe properties of an ideal solution (10)
(b) Explain briefly surface active agents What are their applications in pharmacy. (10)
- Q.2. (a) What are the ideal properties of a suspension? Explain instability in suspensions. (10)
(b) Explain different theories of emulsifications? (10)
- Q.3. (a) Differentiate different types of colloids. (08)
(b) Explain purification and applications of colloids. (12)
- Q.4. (a) Describe the principle, process and applications of fractional distillation? (15)
(b) What are different types of crystals based on their properties? (5)
- Q.5. (a) What is rheology? How the rheology is important in Pharmacy? (10)
(b). Discuss in detail the rheology of Non Newtonian systems. (10)
- Q.6. (a) Define micromeretics. Describe in detail different methods to determine the particle size. (10)
(b) Define Sublimation. Briefly explain the process by citing phase diagram. (10)
- Q.7 Write a note on the following (5 each)
- (a). Levigation
 - (b). Micellization
 - (c). Buffer
 - (d). Industrial Pharmacy



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First Prof. A/2017

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Roll No.

Subject: Pharmaceutics-I (Physical Pharmacy)

PAPER: 3 (Old & New Course)

TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q 1 a) Define Pharmacy profession; Describe the role of Muslim Scientists in the field of Pharmacy. 10 marks
- b) Write a note on 5 marks each
- i) Industrial Pharmacy.
- ii) Hospital Pharmacy
- Q 2 a) Define colloids; Explain briefly optical and kinetic properties of colloids. 10marks
- b) Define suspension, describe flocculated system in detail.. 10 Marks
- Q 3 a) What are colligative properties of a solution? Discuss the application of osmotic pressure and osmolarity in Pharmacy. 10 marks
- b) Define solubility, differentiate between kinetic and equilibrium solubility. How will you determine the solubility of a solid in liquid solvent? 10 Marks
- Q 4 a) Define crystalline and amorphous system. What is crystalline phase; explain with reference to lattice parameter and crystal symmetry. 10 Marks
- b) Differentiate between crystallization and precipitation. Write down common steps of crystallization process. 10 Marks
- Q 5 a) Define hydrolysis; describe its various types with relevant examples. 10 Marks
- b) Define extraction, Name its various types. Discuss the principal of continuous extraction. 10 Marks
- Q 6 Write a note on following terms 5 marks each
- a. Simple and Fraction distillation
- b. Deliquescence and Efflorescence
- c. Triple point and Lyophilization
- d. Types of adsorption isotherms
- Q 7 a) What is rheology? Discuss the flow characteristics of Non-Newtonian systems. 10 Marks
- b) Define & classify the drug stability. Discuss in detail Physical degradation & its preventive measures. 10 Marks



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TIME ALLOWED: 3 hrs.

MAX. MARKS: 100

NOTE: Attempt any FIVE questions. All questions carry equal marks.

- Q 1 a) Define Pharmaceutics, Describe various Era in the history and development of Pharmacy. 10 Marks
b) Write a note on the role of Pharmacist in Community Pharmacy. 10 marks
- Q 2 a) Define disperse system; How you will classify colloids? 10 Marks
b) Define emulsions; Give classification of emulsions, How you will determine the emulsion type? 10 Marks
- Q 3 a) Define solution; discuss its various types in the light of Roult's law. 10 marks
b) What are solubility curves? Describe various factors affecting the solubility of a compound. 10 Marks
- Q 4 a) Differentiate between precipitation and crystallization. Explain in detail process of crystallization. 10 Marks
b) What are the crystal systems? Describe crystals on the basis of crystal habits. 10 Marks
- Q 5 a) Define micromeritics; discuss its importance in Pharmacy. 10 Marks
b) Why extraction of vegetable drugs is important? Discuss the principal of percolation process. 10 Marks
- Q 6 Write a note on following terms 5 Marks each
a. Trituration and Levigation
b. Solubilization and micelle formation
c. Types of distillation
d. Drying and desiccation
- Q 7 a) Define the term Thixotropy; explain the Newton's law of flow with help of diagram and equation. 10 marks
b) Define the Expiry date; Discuss various types of chemical degradation along with its preventive measures. 10 Marks



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First Prof: Annual – 2018
Examination: Doctor of Pharmacy (Pharm.D.)

Roll No.

Subject: Pharmaceutics-I (Physical Pharmacy)
PAPER: 3 Part – II (Old & New Course)

TIME ALLOWED: 2 Hrs. & 30 min.
MAX. MARKS: 80

Attempt this Paper on Separate Answer Sheet provided.

Attempt any 4 questions. Each question carry equal marks.

- Q.2. a). Define physical Pharmacy. Describe the role of Muslim Scientists in the field of Pharmacy. (10)
b). Differentiate between crystal and amorphous compounds. What are seven crystal systems? (10)
- Q.3. a). Define buffers, how they are important? Discuss the derivation of buffer equation for weak acid and its salt. (10)
b). Define & explain the Newton's law of flow with help of diagram and equation. (10)
- Q.4. Define Distillation. Write theory, process and application of steam distillation (20)
- Q.5. a). Define Suspension and Emulsions. Enlist various types of Emulsion. (08)
b). What is creaming and cracking. (06)
c). Explain electrical properties of colloids. (06)
- Q.6. a). Define & classify the drug stability. What is its importance in Pharmacy (08)
b). Define the drug degradation. Discuss in detail Physical degradation & its preventive measures. (12)
- Q.7. Write short notes on the following: (5 each)
- a). Community Pharmacy
 - b). Thixotropy
 - c). Particle size determination
 - d). Sublimation



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Roll No.

First Prof: Annual – 2018

Examination: Doctor of Pharmacy (Pharm.D.)

Subject: Pharmaceutics-I (Physical Pharmacy)

TIME ALLOWED: 30 min.
MAX. MARKS: 20

PAPER: 3 Part – I (Compulsory) (Old & New Course)

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Select the most appropriate answer.

- i) Pharmaceutics is the discipline of pharmacy that is concerned with
 - a) Synthesis of drugs
 - b) Analysis of drugs
 - c) Conversion of drug into medicine
 - d) Effective use of medicine
- ii) Followings are included in official compendia list EXCEPT
 - a) BNF
 - b) Remington pharmaceutical sciences
 - c) British pharmacopoeia
 - d) United states pharmacopoeia
- iii) In order to make solution of a crystalline substance its enthalpy should be
 - a) Reduced
 - b) Increased
 - c) Constant
 - d) Less than amorphous
- iv) Percolation is more efficient process of drug extraction than maceration as it involves
 - a) More time of contact of solvent
 - b) Faster passage of solvent through the bed of drug
 - c) Fresh solvent is passed every time
 - d) More polarity of solvent system
- v) The relationship between amount of gas adsorbed and partial pressure is termed
 - a) Adsorption phenomenon
 - b) Adsorption isotherm
 - c) Desorption phenomenon
 - d) Sorption phenomenon
- vi) A desiccant is a _____ compound
 - a) Hydrolytic
 - b) Homolytic
 - c) Hygroscopic
 - d) Hydrophobic
- vii) In crystallization _____ is the step where the solute molecules or atoms dispersed in the solvent start to gather into clusters, on the microscopic scale
 - a) Nucleation
 - b) Crystal growth
 - c) Crystal habit
 - d) None of the above
- viii) Morphology of solid crystals depends on
 - a) Nucleation
 - b) Crystal growth
 - c) Both A & B
 - d) None of the A & B
- ix) Precipitation is _____ process
 - a) Chemical
 - b) Physical
 - c) Chemical and physical
 - d) Exothermic
- x) Levigation and trituration are process used for _____ of chemical compound/s
 - a) Size reduction
 - b) Mixing
 - c) Milling
 - d) All of the above

- xi) Fractional distillation is a _____ process
- Single evaporation and condensation cycle
 - Double evaporation and condensation cycle
 - Multiple evaporation and condensation cycle
 - Is not a evaporation and condensation cycle
- xii) Centrifugation is a _____ process
- Mixing
 - Separation
 - Elutriation
 - Decantation
- xiii) A substance that absorb water from surrounding and results in the solution is called
- Hygroscopic material
 - Deliquescent material
 - Adsorbent material
 - Hydrophobic material
- xiv) Lyophilization is a process based on _____
- Distillation
 - Liquification
 - Sublimation
 - Elutration
- xv) Drug stability refers to the time from the date ofand packing of the formulation until its physical, chemical and biological activity is not lost
- Production
 - Manufacture
 - Shaping
 - Designing
- xvi) Which one of the following is a plastic material?
- Gel
 - Suspension
 - Water
 - Alcohol
- xvii) Thermo labile drugs such as dextrose injections can decompose during
- Storage
 - Sterilization
 - Drying
 - Sublimation
- xviii) A photochemical reaction is independent of..... and continues even after the illumination is stopped.
- Light
 - Temperature
 - Moisture
 - Radition
- xix) On which of the following rheology cannot be applied?
- Synovial fluids
 - Powders
 - Atmospheric oxygen
 - Bending of bones
- xx) Downward creaming means ----- rate of sedimentation
- Negative
 - Positive
 - Same
 - No change



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Subject: Pharmaceutics-I (Physical Pharmacy)

PAPER: 3 Part – II (Old & New Course)

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 80

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

NOTE: ATTEMPT ANY FOUR QUESTIONS. EACH QUESTION CARRIES EQUAL MARKS.

- Q.2. a). Give brief introduction of pharmacy profession. (10)
Describe the antiquity records in the history of pharmacy.
- b). Name some official and non-official compendia in the field of pharmacy. (10)
Also give content of official compendia.
- Q.3. a). Differentiate between kinetic and equilibrium solubility. How will you determine the solubility of a solid in liquid solvent? (10)
- b). Define crystallization. Write a note on different steps of crystallization process (10)
- Q.4. a). Define Distillation. Write theory, process and application of fractional distillation (20)
- Q.5. a). Define colloids. Differentiate lyophilic and lyophobic colloids. (10)
- b). Explain optical and kinetic properties of colloids. (10)
- Q.6. a). What is rheology? Discuss its applications & importance in Pharmacy? (05)
- b). Discuss the flow characteristics of Non Newtonian system along with rheograms. (15)
- Q.7. Write short notes on the following: (5 each)
- a). Industrial Pharmacy
 - b). Drug Stability
 - c). Extraction processes
 - d). Lyophilisation



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Roll No. in Words.

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MAX. TIME: 30 Min.

PAPER: 3 Part – I (Compulsory) (Old & New Course)

MAX. MARKS: 20

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

- i) Pharmacist knows the following aspects of the drugs
 - a) Therapeutic effects
 - b) Toxic effects
 - c) Synthesis of drugs
 - d) All about drugs
- ii) Drug literature is important in the field of pharmacy as it provides
 - a) Evidence based medicine
 - b) Drugs related information
 - c) Information of medicine
 - d) Methods of drug synthesis
- iii) Liquid-liquid extraction is used for
 - a) Separation of soluble drug from crude drugs
 - b) Purification of extracted drugs
 - c) Concentration of extracts
 - d) Separation of soluble drug from comminuted drugs
- iv) Amorphous substance dissolve ----- crystalline substance
 - a) More
 - b) Less
 - c) Faster
 - d) Slower
- v) Many antibiotics are packed as dry powder to be reconstituted before use; the reason for is
 - a) To avoid hydrolysis
 - b) To slow the rate of hydrolysis
 - c) To deliver accurate dose of drug
 - d) To avoid oxidation
- vi) Crystalline compounds are define as
 - a) Three dimensional long range orderly arrangement of molecules
 - b) Three dimensional short range orderly arrangement of molecules
 - c) Two dimensional long range orderly arrangement of molecules
 - d) Absence of any order in the arrangement of molecules
- vii) Which of the following statement is not true for ignition process
 - a) Used for the standardization of organic substances and crude drugs by means of gravimetric analysis.
 - b) Used to determine impurities of organic salts of alkali metals
 - c) Used to determine the purity of a drug is determined by its ash content.
 - d) Used for isolation of active pharmaceutical compound
- viii) Solid/ liquid equilibrium point in a phase diagram represents _____
 - a) Sublimation point
 - b) Melting point
 - c) Triple point
 - d) Critical point
- ix) Distillation is based on _____ law
 - a) Raoult's Law
 - b) Henry's Law
 - c) Newtonian law
 - d) Charles law
- x) Evaporation is a type of vaporization of a liquid that occurs on the _____
 - a) Surface of liquid
 - b) Entire mass of liquid
 - c) Bulk of the liquid
 - d) None of the above

P.T.O.

- xi) If neither the deformation strain, nor its derivative with time (rate) follows the applied stress then the material is:
- Elastic
 - Solid
 - Viscoelastic
 - Fluid
- xii). The most commonly used dessicant in medicine is
- Tween 80
 - Silica
 - Vit.E
 - CMC
- xiii) Rheology of food in the food processing industry is affected when.....is applied.
- Pressure
 - Butter
 - Volume
 - None of above
- xiv) Mostlyare used for sterilization of thermo labile compounds
- Electric rays
 - Gamma rays
 - X.rays
 - U.V rays
- xv) Water has a viscosity of _____ at 20°C.
- 1.0020 cp
 - 8.90×10^{-4} cp
 - 8.90×10^{-3} dyn.s/cm²
 - 78.2 dyne/cm
- xvi). A suspension is formed from uniform particles of solid, suspended in a solvent. What is the best description of this system?
- Monodisperse and coarse
 - Monodisperse and colloidal
 - Polydisperse and coarse
 - Polydisperse and colloidal
- xvii). The scattering of light by coarse and colloidal dispersed systems is known as?
- Contrast matching
 - Tyndall effect
 - DLVO theory
 - Creaming
- xviii). Creaming is a ----- process
- Reversible
 - Irreversible
 - Both a and b
 - Difficult to predict
- xix). Micro emulsions contain globules of the size about -----
- 10 micrometer
 - 1 micrometer
 - 0.1 micrometer
 - 0.01micrometer
- xx). What makes pharmacists unique in the health care team?
- Pharmacists advise patients on how take their medicines.
 - Pharmacists are experts on communicating with patients and other health care professionals.
 - Pharmacists have access to a vast amount of knowledge on medicines and the actions of drugs.
 - Pharmacists are experts on medicine formulation and use and can apply this to patient care.



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(20x1=20)

Q.1. Encircle the correct option.

1. Thermo labile drugs such as dextrose injections can decompose during
A) Storage (B) Sterilization (C) Drying (D) Sublimation
2. The slop of Rheogram of Newtonian liquids is equal to the:
(A) $\phi = \eta$ (B) $\phi = \frac{1}{\eta}$ (C) $\phi = \frac{\eta}{p}$ (D) $\phi = \frac{p}{\eta}$
3. Rate of chemical reaction increased by 2 to 3 folds for every _____ degree Celsius rise in temperature.
A) 10 (B) 30 (C) 50 (D) 100
4. Rheology of food in the food processing industry is affected when _____ is applied.
(A) Pressure (B) Butter (C) Volume (D) None of above
5. A photochemical reaction is independent of _____ and continues even after the illumination is stopped.
(A) Light (B) Temperature (C) Moisture (D) Radiation
6. On which of the following rheology cannot be applied?
(A) Synovial fluids (B) Powders
(C) Atmospheric oxygen (D) Bending of bones
7. Crystalline compounds are define as:
(A) three-dimensional long range orderly arrangement of molecules
(B) three-dimensional short range orderly arrangement of molecules
(C) two-dimensional long range orderly arrangement of molecules
(D) absence of any order in the arrangement of molecules
8. Crystalline or amorphous nature of pharmaceutical compound can be determined by:
(A) Visual inspection
(B) X-ray structural analysis
(C) Electron microscopy
(D) All of the above
9. Solidi liquid equilibrium point in a phase diagram represents _____.
(A) Sublimation point (B) Melting point
(C) Triple point (D) Critical point
10. Following is not a property of a crystalline compound:
(A) Sharp melting point (B) High entropy
(C) Anisotropy (D) None of the above
11. The temperature at which the liquid starts to boil.
(A) Dew point (B) Bubble point
(C) Triple point (D) None of the above
12. It is the process by which the solids get converted into liquids without the addition of any solvent.
(A) Fusion (B) Elutriation
(C) Sublimation (D) Levigation

P.T.O.

13. A substance is _____ if it absorbs water from the air until it forms solution.
 (A) Deliquescent (B) Amorphous
 (C) Anhydrous (D) All of the above
14. _____ is also termed as dry grinding:
 (A) Trituration (B) Levigation
 (C) Elutriation (D) None of the above
15. The basic principle of lyophilization process is _____
 (A) Sublimation (B) Elutriation
 (C) Levigation (D) Crystallization
16. Hard cake is formed in Suspensions
 (A) Flocculated (B) Non-Flocculated
 (C) Colloidal suspension (D) None
17. The term pharmacy is derived from word "pharmakon" which is:
 (A) Unani (B) English
 (C) Latin (D) Greek
18. Luther of Medicine who opposed Hippocrates's humoral pathology concepts
 (A) Paracelsus (B) Babylonian
 (C) William Proctor (D) Remington
19. The pharmaceutical record which contains more than 700 drugs of ancient history is:
 (A) Magna Carta (B) Assyrian
 (C) Ebers Papyrus (D) Pharmaceutical Codex
20. The science and study of particle is
 (A) Microemulsion (B) Milling
 (C) Micromeritics (D) Angle of repose



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Paper: 3 Part – II (Old & New Course)

Time: 2 Hrs. 30 Min. Marks: 80

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Note: Attempt any *FOUR* questions. Each question carries equal marks.

- Q.2. (a) Define Rheology, give its classification and discuss the significance of the rheology in Pharmacy (12)
- (b) Define Thixotropy, discuss its importance with reference to non-Newtonian systems. (08)
- Q.3. (a) Discuss the factors affecting on Drug Stability and explain each reason of drug stability with examples. (12)
- (b) Discuss the chemical degradation of drug stability and its preventive measures (08)
- Q.4. (a) Define and discuss the basic principle of distillation? (10)
- (b) Write names of different types of distillation explain in detail the principle, apparatus and application of steam distillation. (10)
- Q.5. Write a short note on only **FOUR** of the following (05 Marks each) (20)
- a. Precipitation (5)
 - b. Eftlorescence (5)
 - c. Desiccation (5)
 - d. Lyophilization (5)
 - e. Crystallization
- Q.6. (a) What are different methods of preparation of lyophobic Colloids (12)
- (b) Define Suspension. Differentiate flocculated and deflocculated suspensions. (08)
- Q.7. (a) Define Micrometrics and give its applications in Pharmacy. (12)
- (b) What is Bowl of Hygeia; write down the role of Muslim Scientists in the field of Pharmacy. (08)



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Note: Attempt any *FOUR* questions. Each question carries equal marks.

Question No. 2

- a) What are colligative properties of the solutions? Briefly discuss them with the reference to lowering of the vapour pressure, depression in freezing point and osmotic pressure? (12)
- b) What are the ideal solutions? Explain negative deviations from Raoult's law? (08)

Question No. 3

- a) What are isotonic solutions? Explain measurement of tonicity based on sodium chloride equivalent method and White Vincent method? (12)
- b) Briefly describe the applications of isotonic solutions in pharmacy? (08)

Question No. 4

- a)- Define colloids. Describe various methods for the preparation of colloids (10)
- b)- Discuss the various properties of colloids (10)

Question No. 5

- a)- Define Micromeritics and discuss the different methods for the measurement of Particle size. (12)
- b)- Discuss the effects of particle size in designing the pharmaceutical dosage forms (08)

Question No. 6

- a)- Define Rheology, list the types of Rheological materials and discuss in detail about the Non-Newtonian Materials with examples. (12)
- b)- Briefly explain about Thixotropy (8)

Question No. 7

- a)- List the Physical and Chemical factors affecting on drug stability. and discuss in detail about the chemical factors affecting on drug stability. (12)
- b)- Discuss the different orders of reaction and their importance with reference to the stability of Drugs. (08)



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Time: 30 Min. Marks: 20

Roll No. in Fig.

Roll No. in Words.

Attempt this Paper on this Question Sheet only.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

.....
Signature of Supdt.:

Q.1. Encircle the right answer cutting and overwriting is not allowed. (20x1=20)

1) Emulgents having HLB value between 15-18 are called

a) Antifoaming agents

b) Solubilizing agents

c) W/O Emulsifier

d) Wetting & Spreading agents

e) None of above

2) BaSO₄ X-Ray contrast media is an example of

a) Colloids

b) Surfactants

c) Emulsion

d) Suspension

e) Humidity

3) The most important concern during continuous hot extraction procedures is:

a) Cost of drug

b) Therapeutic value of drug

c) Nature of solvent

d) Stability of drug

e) Concentration of the product

4) Florentine receiver is typically used in:

a) Vacuum distillation

b) Fractional distillation

c) Simple distillation

d) Steam distillation

e) Destructive distillation

5) Steam distillation is used for:

a) Water immiscible liquids

b) Water immiscible liquids of high boiling point

c) Water immiscible liquids of low boiling point

d) Miscible liquids

e) Two immiscible liquids having different boiling point

6) For good flow properties, angle of repose should be:

a) 0°

b) Less than 30°

c) 30°-40°

d) Greater than 40°

e) 100°

7) Colloidal particles can be seen under:

a) Light microscope

b) Ultramicroscope

c) Ordinary microscope

d) Compound microscope

e) Optical microscope

8) Addition of alcohol to hydrophilic colloid leads to:

a) Precipitation

b) Crystallization

c) Solubilisation

d) Stabilization

e) Calcination

9) Salting out occurs at high salt concentration in:

a) Lyophilic colloids

b) Lyophobic colloids

c) Association colloids

d) Lyophilic and association colloids

e) Lyophobic and association colloids

10) A surfactant with Hydrophile-Lipophile Balance (HLB) value 16-20 is expected to function as:

a) Foaming agents

b) Wetting agents

c) Detergents

d) Solubilizers

e) Anti-foaming agents

11) Mixture of colloids having different mobility can be separated by

a. Electrodialysis

b. Electrophoresis

c. Decantation

d. Ultrafiltration

12) Disperse systems are classified according to

a) Particle Size

b) Ionic character

c) Solubility

d) None of above

13) The colligative properties of a solution are related to:

- a) pH of the solution
- b) pKa
- c) Total number of solute present in solution
- d) Total number of ions in the solution
- e) Total volume of solution

14) When blood cells are mixed with 2% NaCl solution:

- a) Cells retain their normal size
- b) Cells shrink as the solution is hypotonic
- c) Cells burst as the solution is hypotonic
- d) Cells shrink as the solution is hypertonic
- e) Cells burst as the solution is hypertonic

15) Who gave the theory of humors in 400 B.C?

- a) Theophrastus
- b) Hippocrates
- c) Dioscorides
- d) Galen
- e) Avicenna

16) Coulter counter method determines

- a) Volume of particles
- b) Particle surface area
- c) Adsorption
- d) Air permeability
- e) Projected diameter

17) Number of moles of solute in 1000g (1 kg) of solvent is called

- a) % weight/volume
- b) %volume/weight
- c) Molarity
- d) Molality
- e) Mole fraction

18) Surfactants having HLB value of more than 16 are useful as -----

(Solubilization)

- a. Solubilizing agents
- b. Detergents
- c. Anti-foaming agents
- d. Suspending agents
- e. Emulsifying agents

19) The substance that is attached to the surface of solid is called

- a. Distillate
- b. Sublimate
- c. Adsorbate
- d. Filtrate
- e. Residue

20) Rapid cooling yields

- a. Small crystals
- b. Very small crystals
- c. Medium size crystals
- d. Very large crystals
- e. Coherent masses