University of Mumbai
Physical Pharmaceutics II
Question Bank

Question no	MCQ
1	Which of the following is an example of a lyophobic colloid?
a	**Gold**
b	Gelatin
c	Acacia
d	Albumin
2	Accelerated stability testing is done to
a	Predict diffusion constant
b	Predict dissociated constant
c	**Predict shelf life of the formulation**
d	Determine activation energy
3	In a chemical reaction, the rate constant is independent of the initial concentration. The order of the reaction is
a	First
b	**Zero**
c	Third
d	Second
4	If the angle of repose is > 45 degrees, then flow will be

a	Passable
b	Excellent
c	**Poor**
d	Fair
5	Bingham bodies are materials that exhibit
a	**Plastic flow**
b	Pseudoplastic flow
c	Dilatant flow
d	Newtonian flow
6	Out of the following fluids, find out the odd one on the basis of their rheological behaviour:
a	Distilled water
b	Glycerine
c	Ethanol
d	**Starch suspension**
7	CGS unit of coefficient of viscosity is
a	**dynes sec cm^{-2}**
b	kg cm^{-1} sec^{-1}
c	dynes sec m^{-2}
d	kg cm^{-2} sec^{-1}
8	The sedimentation rate of particles in _____ suspension is found to be slow.

a	**Deflocculated**
b	Flocculated
c	Fine
d	Coarse
9	During elastic deformation, the stress–strain relationship for a specimen is described by
a	**Hooke's law**
b	Boyle's law
c	Beer Lambert's law
d	Charle's law
10	The phenomenon of suspended solids growing in size during storage is known as _____
a	Sedimentation
b	Agglomeration
c	Flocculation
d	**Crystal growth**
11	Heckel relationship deals with
a	**Force Density Relationship**
b	Temperature Density relationship
c	Force Dissolution relationship
d	Temperature - surface tension relationship

12	The phenomenon of protection means:
a	hydrophobic colloid adsorb on the surface of hydrophilic colloid and form a protective layer.
b	**hydrophilic colloid adsorb on the surface of hydrophobic colloid and form a protective layer**
c	hydrophilic coarse particles adsorb on the surface of hydrophobic
d	hydrophilic molecular dispersion adsorbs on the surface of hydrophobic colloid and form a protective layer
13	Coacervate formation means
a	**Mixing of oppositely charged hydrophilic colloids and separation of colloidal rich layer.**
b	Mixing of similar charged hydrophilic colloids and separation of colloidal rich layer.
c	Mixing of oppositely charged molecular dispersions and separation of colloidal rich layer.
d	Mixing of oppositely charged hydrophilic colloids and hydrophobic and separation of colloidal rich layer.
14	The extent of sedimentation is quantitatively expressed by _____.
a	Degree of deflocculation
b	**Sedimentation volume**
c	Sedimentation rate
d	Sedimentation mass
15	Andreasen apparatus is widely used to determine particle size distribution b
a	Microscopy method

b	**Sedimentation method**
c	Sieving method
d	Conductivity method
16	Coulter counter is used to determine
a	**Particle volume**
b	particle shape
c	Particle flow properties
d	Powder density
17	Which of the following is the half -life of zero order reaction
a	t1/2 =0.693/k
b	t1/2 = 0.693/2k
c	t1/2 =2k
d	**t1/2 =a/2k**
18	Climate zone II is
a	**Subtropical and Mediterranean climate**
b	Hot/dry climate
c	Hot/humid climate
d	Moderate climate
19	In flocculated suspension, the supernatant layer is _____
a	Cloudy
b	**Clear**

c	Turbid
d	Opaque
20	Structured vehicles are generally prepared using _____
a	**Hydrocolloids**
b	Lyophobic
c	Hydrophobic polymers
d	Waxes
21	Association colloids are known as ……..colloids
a	Lyophilic
b	Lyophobic
c	**Amphiphilic**
d	Hydrophilic
22	In electrodialysis electrical potential is applied to
a	Reduce the speed of the process
b	**Increase the speed of the process**
c	Stop the process
d	Invert the process
23	Lyophobic systems ………..
a	**Show most intense tyndall effect**
b	Least intense tyndall effect
c	Moderately intense tyndall effect

d	Does not show tyndall effect
24	Dilatant flow is characterized as a reverse phenomenon of:
a	Newtonian flow
b	Plastic flow
c	**Pseudoplastic flow**
d	Rheopexy
25	A plot of shear rate, as a function of shear stress is called
a	**Rheogram**
b	Standard Plot
c	Humidity Chart
d	Histogram
26	Brook-field viscometer is an example of _____ viscometer.
a	Cone and plate
b	Extrusion
c	Rotating sphere
d	**Rotating spindle**
27	Specimen is described by
a	**Hooke's law**
b	Boyle's law
c	Beer Lambert's law
d	Charle's law

28	A deformation that recover after the release of stress is known as
a	plastic deformation
b	**elastic deformation**
c	pseudoplastic deformation
d	creep
29	The ratio of void volume to bulk volume is known as
a	**Porosity**
b	Tapped density
c	Granule volume
d	Bulk Density
30	Helium pycnometer is used to determine
a	Size
b	**True density**
c	Sedimentation rate
d	Surface area
31	The powder having low bulk density or large bulk volume is known as
a	Bulk powder
b	Heavy powder
c	**Light powder**
d	Granular powder
32	Which of the following is the half-life of First order reaction?

a	t1/2 =2k
b	t1/2 = A0/2k
c	. t1/2 = 0.693/2k
d	**t1/2 =0.693/k**
33	Climate zone III is
a	**Hot/dry climate**
b	Subtropical and Mediterranean climate
c	Hot/humid climate
d	Moderate climate
34	The dielectric constant is used to measure
a	Spreadability of the solvent
b	**Polarity of the solvent**
c	Viscosity of the solvent
d	Temperature of the solvent
35	_____is the reaction of compounds and molecular oxygen
a	Photolysis
b	Hydrolysis
c	**Auto-Oxidation**
d	Thermolysis
36	The type of emulsion can be easily identified using the following test except _____ test.

a	Dye solubility
b	Creaming
c	Dilution
d	**Redispersibility**
37	As the viscosity of the emulsion is _____ , the flocculation of globules will be reduced.
a	**Increased**
b	Decreased
c	Maintained zero
d	Lowered
38	In an emulsion, the relative volume of water and oil is expressed as _____.
a	Phase ratio
b	**Phase volume ratio**
c	Phase inversion
d	Viscosity
39	_____ is an example of hydrophilic colloid used in preparation of an emulsion.
a	**Acacia**
b	Spans
c	Bentonite
d	Veegum

40	_____ surfactants do not impart charges on interfacial films.
a	Ionic
b	**Non ionic**
c	Cationic
d	Anionic
41	Donnan membrane effect means:
a	**Driving the drug ion of similar charge to the opposite side of the semipermeable membrane**
b	Driving the drug ion of opposite charge to the opposite side of the semipermeable membrane
c	Driving the drug ion of neutral charge to the opposite side of the semipermeable membrane
d	Stopping the transfer of drug ion of similar charge to the opposite side of the semipermeable membrane.
42	Which of the following is an example of lyophilic colloid:
a	Gold
b	Silver
c	Sulphur
d	**Albumin**
43	Lyophobic colloids are:
a	Easy to prepare and thermodynamically stable
b	Easy to prepare but thermodynamically unstable

c	Difficult to prepare but thermodynamically stable
d	**Difficult to prepare and thermodynamically unstable**
44	Sieving method is used for size distribution analysis of powder. The disadvantage of this method is:
a	agglomerates can be identified
b	**attrition of powder is possible**
c	large number of sieves are required
d	tedious and time consuming
45	While using sedimentation method for size analysis, addition of a deflocculating agent to a suspension is necessary in order to:
a	accelerate the process of sedimentation
b	make the particles spherical
c	**prevent the aggregation**
d	satisfy Reynolds number
46	When coulter-counter apparatus is employed for powder analysis, the following criterion is important:
a	dispersion medium should be colored
b	**dispersion medium should be conducting**
c	suspended particles should be charged
d	suspended particles should be spherical
47	Newton's law of viscosity relates
a	intensity of pressure and rate of deformation
b	**shear stress and rate of shear**

c	shear stress and viscosity
d	viscosity and rate of shear
48	As the temperature of liquid increases, what is the change in viscosity?
a	**Decreases**
b	Decreases with pressure
c	Does not affect
d	Increases
49	The effect of temperature on rate of reaction is explained by
a	Nernst equation
b	**Arrhenius equation**
c	Noyes whitney equation
d	Fick's law
50	Porosity is expressed in
a	Millimeter
b	**Percentage**
c	Gram/Millimeter
d	Newton
51	Magnesia Magma exhibits
a	**Antithixotropy**
b	Thixotropy
c	Spur in the rheogram

d	Rheopexy
52	Climate zone IV is
a	**Hot/humid climate**
b	Hot/dry climate
c	Subtropical and Mediterranean climate
d	. Moderate climate
53	Andreasen apparatus consists of
a	Glass electrode
b	Reference electrode
c	**Pipette**
d	Hydrogen electrode
54	In the potential energy curves, the deflocculated suspension represents the …………….
a	**Primary minimum**
b	Secondary minimum
c	Tertiary minimum
d	Primary maximum
56	When a strong beam of light is passed through a colloidal dispersion, a visible cone, resulting from the scattering of light by the colloidal particles is formed this is called as
a	Schultz rule
b	**Faraday –Tyndall effect**

c	Sensitization
d	Peptization
57	Heckle plots can NOT be referred for one of the following relationships:
a	Force vs density
b	**Force vs dissolution**
c	Force vs porosity
d	Force vs volume
58	Which of the following is the half- life of Second order reaction?
a	t1/2 = A0/2k
b	t1/2 =0.693/k
c	t1/2 = A0/2k
d	**t1/2 = 1/ak**
59	In the deflocculated suspension the sediment formed is a ……………..
a	Redispersible non porous cake
b	**Hard cake**
c	Soft gel
d	Redispersible hard cake
60	A deformation that recover after the release of stress is known as
a	plastic deformation
b	**elastic deformation**
c	pseudoplastic deformation

d	creep
61	If the angle of repose is 25-30 degrees, then flow will be
a	Passable
b	Poor
c	**Excellent**
d	Fair
62	Hausner ratio is
a	**Tapped density / Bulk density**
b	Bulk density / Tapped density
c	Bulk volume / Tapped volume
d	Tapped volume / Bulk volume
63	Searle type of viscometer uses
a	stationary cup and stationary bob
b	**stationary cup and rotatory bob**
c	rotatory cup and stationary bob
d	rotatory cup and rotatory bob
64	Spherical colloidal material yields dispersions of relatively
a	**low viscosity**
b	Moderate viscosity
c	High viscosity
d	Very high viscosity

65	…………………………is an example of water miscible solvent
a	**Glycerine**
b	Benzene
c	Octanol
d	Span80
66	According to Schulze Hardy rule
a	**The higher the valency of the ion greater is the precipitating power**
b	Lower the valency of the ion greater is the precipitating power
c	The higher the valency of the ion the precipitation power will be lower
d	The precipitating power of an ion is not depended on the valency
67	Plastic flow behavior can be explained by:
a	apparent viscosity
b	area of hysteresis loop
c	hysteresis loop
d	**yield value**
68	……………………is concentration of globules at the top or bottom of the emulsion
a	Coalescence
b	**Creaming**
c	Breaking
d	Phase inversion

69	Kinematic viscosity is the:
a	ratio of viscosity of dispersion to that of its liquid continuous medium
b	ratio of specific viscosity to concentration
c	**absolute viscosity divided by density of liquid at specified temperature**
d	ratio of viscosity of continuous medium to that of its dispersion
70	Emulsions are …………………………phase systems in which the dispersed phase is also a liquid
a	**Two**
b	Mono
c	Multiple
d	Triple

	Descriptive Questions
1	a) Write Heckel equation, draw Heckel plots. Explain the information derived from these plots. 6M b) Describe elastic and plastic deformation of solids.6M
2	a)Write a note on interfacial properties of suspended particles in suspension.6M b) Discuss the various identification tests used to differentiate the type of emulsion.6M
3	a) The initial concentration of a drug X was found to be 0.075 M. The concentration after 12 hours was 0.055 M. Calculate the reaction rate constant if decomposition of drug follows first order kinetics.6M b) How does temperature influence drug degradation? Explain with the help of Arrhenius equation.6M
4	a) Discuss in brief the factors influencing the physical stability of an emulsion.6M

	b)Describe in detail flocculated and deflocculated suspension.6M
5	a) Explain the methods for determining particle size. 6M b) What is true density? Explain Helium displacement method to determine true density.6M
6	Explain the terms with respect to powder properties: Void volume, True density, Bulk density, Granule density.12 M
7	Write a note on interaction of colloids? Explain DLVO theory in detail.12M
8	Explain the Kinetic properties of colloids in detail. - 12 marks
9	Explain the optical properties of colloids in detail (12 marks)
10	Classify viscometers. Describe the principle, construction and working of cup and bob viscometer.(12 marks)
11-a	Describe types of particle deformation. (6 marks)
11-b	Describe the mechanical behavior of solids in terms elastic modulus. (6 marks)
12-a	What do you understand by particles packaging arrangements in powders? How is powder porosity evaluated?(6 marks)
12-b	What are the methods used for determining particle size? Explain in detail any two.(6 marks)
13-a	Enlist the various theories of emulsification. Discuss any two theories in brief.(6 marks)
13-b	State Stoke's law and it's significance in sedimentation of suspension(6 marks)
14-a	Describe any 3 factors influencing particle settling in suspension(6 marks)
14-b	Discuss the various identification tests used to differentiate the type of emulsion(6 marks)
15-a	What is the formula to calculate the shelf life and k of a drug which follows zero order and first order kinetics.(6 marks)

15-b	What is photolytic degradation? What are the ways to prevent it?(6 marks)
16-a	Draw the flow curves of newtonian and non-newtonian types of flow. Give one example of each type of flow. - 6 marks
16- b	Describe the factors influencing viscosity. - 6 marks
17- a	Mention the measures that could be taken to prevent or reduce hydrolytic decomposition of drugs. - 6 marks
17- b	The initial concentration of a drug X was found to be 0.080 M. The concentration after 12 hours was 0.060 M. Calculate the reaction rate constant if decomposition of drug follows first order kinetics. - 6 marks
18- a	Enlist the derived properties of powders. Explain Liquid displacement method to determine true density. - 6 marks
18- b	What are the methods used for determining particle surface area? Explain any one. - 6 marks
19- a	Discuss the various factors influencing particle settling in suspension. - 6 marks
19- b	Discuss sedimentation volume as a parameter to determine the extent of sedimentation in suspension. - 6 marks
20- a	Discuss the various physical instabilities in emulsion. - 6 marks
20- b	Differentiate between the flocculated and deflocculated suspension. - 6 marks
21	Describe the applications of rheology in pharmaceutical operations. Explain non-Newtonian type of flow with rheograms, mechanism and suitable examples. – 12 marks