Al-Azhar University of Gaza

College of Pharmacy

Physical Pharmacy II

Final Exam- Jan 2010

Name of Student (Arabic):

Question	Mark
Q1	
Q2	
Q3+4+5	
Total (70)	

1

Q1: Please circle the correct answer (only one circle):- (40M)

1- The color of colloidal dispersions is related to...
a) The molecular weight of particles.
b) The size of particles.
c) The shape of particles.
d) The sedimentation rate of particles.

2- Used sometimes to increase the solubility and stability of drugs in aqueous and oily preparations...
a) Lyophilic colloid.
b) Lyophobic colloid.
c) Association colloid.
d) Heterogeneous dispersions.

3- Dispersions that are stable generally in the presence of electrolytes, they may be salted out by high concentrations of very soluble electrolytes...
a) Lyophilic colloid.
b) Lyophobic colloid.
c) Association colloid.
d) Hydrophobic colloids.

4- To form lyophobic colloids by condensation, the required conditions are...
a) High degree of initial saturation followed by change in solvent.
b) High degree of initial saturation followed by milling.
c) High degree of initial super saturation followed by change in temperature.
d) High degree of initial super saturation followed by peptization.

5- Aggregation number of the micelle is...
a) The concentration of monomers at which micelles forms.
b) The number of monomers that condensate to form a micelle.
c) The number of micelles that forms in the dispersion medium.
d) The concentration of monomers undergoing adsorption at the air- water interface

6- A shape of micelles exists at concentrations relatively close to cmc...
a) Bicontinuous.
b) Oblate.
c) Laminar.
d) Spherical.

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13- A process in which a pressure is employed to force the solvent through a microporous membrane which prevents the passage of large solute molecules..

a) Dialysis.
b) Osmosis.
c) Ultra filtration.
d) Electro dialysis.

14- The rate of diffusion at unit cross sectional area in the steady state of flow is known as...

a) The Flux.
b) Fick's First law.
c) Fick's second law.
d) The diffusion coefficient.

15- The time required for a penetrate to establish a uniform concentration gradient within the membrane separating the donor from the receptor compartment is ...

a) The lag time.
b) The diffusion time.
c) The steady state time.
d) The quasi stationary state time.

16- The concentration of a saturated solution of the compound at the surface of a tablet and at the temperature of experiment is...

a) The bulk concentration.
b) The solubility concentration.
c) The steady state concentration.
d) The aqueous diffusion layer concentration.

17 An equation for mass transport that determines the change in concentration with time a.. definite point in the system...

a) Fick's 1..st law.
b) Fick's secon. law.
c) Noye's- Wittney- equation.
d) Henderson- Hasselbu -h equation.

18- Drugs are absorbed from th. GIT by a passive diffusion depending on the fraction of undissociated drug at the pH of intestines...

a) Henderson- Hasselbalch equation.
b) Stoke's law.
c) Newton law.
d) PH- partition hypothesis.

4

7- A property depends on Faraday-Tyndall effect, widely used method for determining the molecular weight of colloids...
a) Osmotic pressure.
b) Sedimentation rate.
c) Viscosity.
d) Light scattering.

8- The fractional decrease in intensity due to scattering as the incident light passes through 1 cm of solution is called...
a) Turbidity. _
b) Brownian motion.
c) Resolution power.
d) Angle of observation.

9- A property that relates to the motion of particles with respect to the dispersion medium and is gravitationally induced...
a) Diffusion.
b) Osmosis.
c) Sedimentation.
d) Viscosity.

10- The amount of material diffusing per unit time across unit area when the concentration gradient is unity is known as...
a) Diffusion coefficient.
b) Flux.
c) Fick's first law.
d) Fick's second law.

11- The velocity of sedimentation of colloids is given by ...
a) Henderson- Hasselbalch equation.
b) Vant Hoff equation.
c) Stoke's Law.
d) Sutherland- Einstein equation.

12- An electrokinetic phenomenon, characterized by creation of a potential by forcing a liquid to flow through a plug or bed of particles...
a) Electrophoresis.
b) electro-osmosis.
c) Sedimentation potential.
d) Streaming potential.

... the higher the viscosity of a liquid...
a) The greater shear stress is required to produce a certain rate of shear.
b) The greater shear rate is required to produce a certain shear stress.
c) The lower the resistance of the liquid to flow.
d) The higher the fluidity of the liquid.

20. The activation energy required to initiate flow between the molecules ...
a) Decreases with an increase in temperature.
b) Increases with an increase in temperature.
c) Decreases with a decrease in temperature.
d) Remains constant regardless of temperature.

21. The slope of a plastic system rheogram is equal to...
a) The mobility.
b) The yield value.
c) The elasticity coefficient.
d) The plasticity coefficient.

22. Can be used as an indication of the force of flocculation in flocculated suspensions...
a) The plastic viscosity.
b) The pseudoplastic viscosity.
c) The mobility.
d) The yield value.

23. Cellulose- based system with a rheogram consists of a curve begins as the origin without a yield value...
a) Newtonian system.
b) Plastic system.
c) Pseudoplastic system.
d) Diltant system.

24. Diltant systems are characterized by...
a) A decrease in resistance to flow with an increase in rates of shear.
b) Being a shear thinning system.
c) Processing that is facilitated by the use of high speed mixers.
d) The presence of high percentage of dispersion medium.

31- Film pressure is defined as *except...*

a) Compressive force per unit area on the float.

b) The lowering of water resistance to contraction.

c) An expansion pressure exerted on the monolayer that opposes the surface tension.

d) An expansion pressure exerted on the monolayer that opposes the contraction of water surface.

32- The mass of adsorbate that one gram of the adsorbent can adsorb when the monolayer is complete is known as...

a) The adsorption capacity.

b) The affinity constant.

c) The binding constant.

d) The adsorption isotherm.

33- To measure the wetting agent efficiency, it is possible to ...

a) Measure the contact angle.

b) Measure the spreading coefficient.

c) Measure the interfacial tension.

d) Measure the time for a weighted cotton yarn to sink through the wetting solution.

34- Regardless of how much ethanol is present in the blood, its rate of elimination from the body is constant, this is ...

a) Zero order kinetics.

b) First order kinetics.

c) Second order kinetics.

d) Pseudo zero order kinetics.

35- If the mechanism of a complex reaction is well known, the orders of the rate law are equal to ...

a) The molecularity of the whole reaction.

b) The molecularity of the rate limiting step.

c) The coefficients in the whole balanced equation.

d) The molecularity of the fastest step.

36- Fast reactions are characterized by...

a) High overall rate constant.

b) High activation energy (Ea).

c) The potential energy of the reactants is lower than that of products.

d) The potential energy of the activated complex is very high.

25- If the rate of shear was reduced once the maximum rate had been reached, and the down curve is displaced to the left of the up curve , this is a...

a) Newtonian system.
b) Thixotropic system.
c) Antithixotropic system.
d) Rheopectic system.

26- A phenomenon in which a solid forms a gel more readily when gently shaken, this is the...

a) Anti thixotropy.
b) Thixotropy.
c) Rheopexy.
d) Diltancy.

27- The force necessary to detach a platinium-ring immersed at the interface is proportional to the interfacial tension, this is the principle of...

a) Capillary rise method.
b) Du Noüy tensiometer.
c) Surface free energy.
d) Three sided wire frame.

28- Spans are a group of surfactants characterized by being...

a) Hydrophilic amphiphiles.
b) Polyoxyethylene derivatives of Tweens.
c) With a low value of HLB.
d) Anionic molecules.

29- O/w emulsifiers have the following properties *except*...

a) High HLB.
b) Hydrophilic surfactants.
c) Used to prepare w/o emulsions.
d) An example is polyoxyethylene sorbitan monolaurate.

30- When a slightly soluble oil is placed on the surface of water in a film balance, all of the following is correct *except*...

a) It is possible to calculate the thickness of the film.
b) It is possible to calculate the length of the oily molecules.
c) It is possible to calculate the cross sectional area of the oily molecules.
d) It is possible to calculate the interfacial tension between the oil and water.

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37- If the polarity of the activated complex is less than that of reactants, the reaction can be accelerated in...

a) Non polar solvents.
b) Polar solvents.
c) High solubility parameter solvents.
d) High dielectric constants solvents.

38- The integrated rate equation for a second order reaction with an equal initial concentrations of reactants is...

a) $\dfrac{a}{x(a-x)} = Kt$

b) $Kt = \dfrac{2.303}{(a-b)} \log \dfrac{a(a-x)}{b(b-x)}$

c) $K = \dfrac{x}{at(a-x)}$

d) $K = \dfrac{x}{t(a-x)}$

39- The unit of 80% fractional life period of a drug decomposing at a first order kinetics is...

a) Mol. L^{-1}. min^{-1}.
b) Min^{-1}.
c) Mol^{-1}. L. min^{-1}.
d) Min.

40- Used to calculate the expiration date of drugs...

a) Accelerated stability study.
b) Long term stability study.
c) Arrhenius plots.
d) a and b are correct.
e) a and c are correct.

Q3: An ultracentrifuge is operated at 8000 rpm. The mid point of the cell in which the sample in place is 1.4 cm from the center of the rotor. What is the angular acceleration and the number of "gs" acting on the sample?

(5M)

draw the following relationships: (10M)

The lag time of a diffusing material versus the permeability coefficient.
Viscosity versus rate of shear for pseudoplastic substances.
Determination of molecular weights of colloids using viscosity.
The concentration-time plot of a decomposing drug following second order kinetics.
The amount permeated through animal skin from an aqueous solution versus time.

(1)

(2)

(3)

(4)

(5)

9
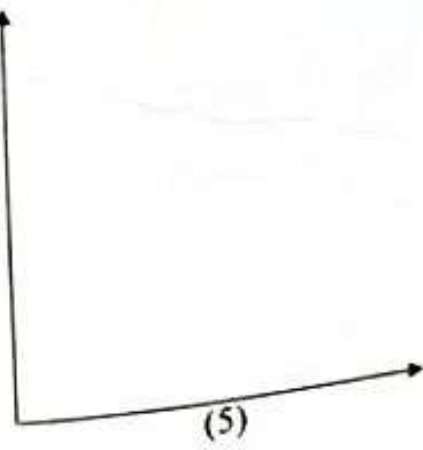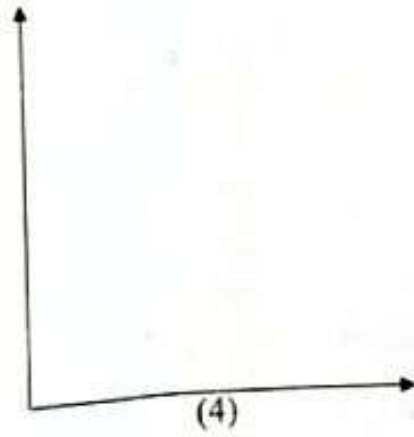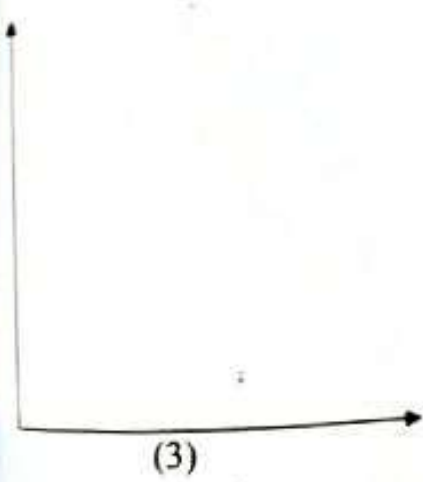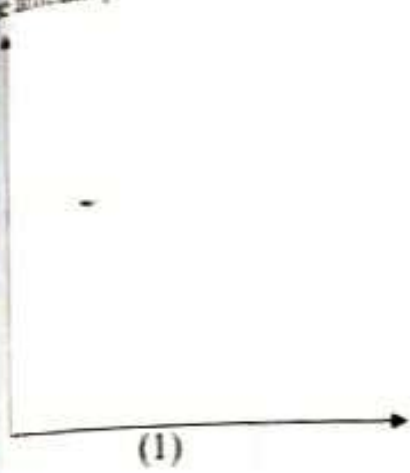
Q5: PVA234 was separated into four fractions of various molecular weights by means of a column packed with the chromatographic gel. Calculate the molecular weight of these fractions from their intrinsic viscosities. The value of (a) is 0.71 (dimensionless) and (K) is 2.56×10^{-4} cm^3g^{-1}. The experimental intrinsic viscosities $[\mu]$ are 0.345, 0.765, 1.02, and 1.32 cm^3/g. **(7M)**

Good Luck
Dr. Hend M. Abu Amara

Q4: A coarse powder with a true density of 2.44 gcm^{-3} and a mean diameter of 160 μm was dispersed in a 2% carboxymethylcellulose dispersion having a density of 1.01 gcm^{-3}. The viscosity of the medium at low shear rate was 25 poises. Calculate the average velocity of sedimentation of the powder in cm/sec. (7M)