

- (vi) The ratio of stress to strain is called
- (a) Poisson ratio (b) Youngs modulus
(c) Shear Strain (d) Elastic modulus
- (vii) Structured vehicle is included in the formulation of a suspension in order to:
- (a) Decrease interfacial tension
(b) Reduce the size by chemical means
(c) Prevent cake formation
(d) Prevent sedimentation of particles
- (viii) If the density of the disperse phase is more than that of the dispersion medium, then the Creaming is:
- (a) At the centre of the emulsion
(b) In both the direction
(c) In downward direction
(d) In upward direction
- (ix) Which of the following ingredients improves the flow property of granules?
- (a) Surfactant (b) Glidant
(c) Emollient (d) Lubricant
- (x) Liquid who shows increased viscosity on applying stress is
- (a) Dilatant (b) Pseudo plastic
(c) Plastic (d) Thixotropic
- (xi) Which of the following equipment is used for determining the particle size distribution of pharmaceutical powders?
- (a) Andreason pipette (b) Shear box
(c) Ostward viscometer (d) Pycnometer
- (xii) Which the following equation is used for predicting the shelf life of a drug product?
- (a) Noyes-Whitney equation
(b) Henderson-hasselbalch equation
(c) Michaelis-Menten equation
(d) Arrhenius equation
- (xiii) Void volume of powder can be defined as:
- (a) True volume-bulk volume
(b) Bulk volume-True volume
(c) Bulk volume-Tapped volume
(d) True volume-Tapped volume

- (xiv) Permanent deformation of particles observed in which of the following condition?
- (a) After reaching yield value (b) Before the yield value
(c) During rearrangement (d) Elastic limit
- (xv) The system which undergoes gel-to-sol transformation is known as:
- (a) Newtonian (b) Elastic
(c) Shear thinning (d) Shear thickening
- (xvi) Which of the following instrument is used for determination of viscosity of non-Newtonian flow?
- (a) Ostwald viscometer (b) Falling sphere viscometer
(c) MacMichael viscometer (d) Du Nouy tensiometer
- (xvii) Which one of the following is the instability marker of an emulsion?
- (a) Creaming (b) Flocculation
(c) Phase inversion (d) All of the above
- (xviii) Bingham bodies show which type of flow?
- (a) Newtonian flow (b) Plastic flow
(c) Pseudoplastic flow (d) Dilatant
- (xix) Thixotropy phenomenon can be applied to _____ system.
- (a) Shear thinning system (b) Shear thickening system
(c) Both of above (d) None of above
- (xx) Movement of charged particles through a liquid under the influence of an applied potential difference is known as:
- (a) Zeta potential (b) Streaming potential
(c) Electro-osmosis (d) Electrophoresis

2. Answer the following questions: (Any seven) (7 × 5 = 35)

- (a) Describe the various methods for preparation of colloids.
- (b) What do you mean by thixotropy? Describe the role of thixotropy in formulation.
- (c) Describe the principle and working of Ostwald viscometer with a labelled diagram.
- (d) What is controlled flocculation? Discuss the various means by which controlled flocculation of a suspension can be achieved.
- (e) Describe the signs of instability in an emulsion and suggest the preventive measures.
- (f) Explain the working principle of Coulter-counter method for particle size measurement with the help of a labelled diagram.
- (g) Discuss the different methods for purification of colloids.
- (h) Discuss briefly the different factors affecting rate of chemical reaction in drug stability.
- (i) Define 'order of reaction'? Derive the expression to calculate rate constant, half-life and shelf life for a zero-order reaction.

3. Answer the following questions: (Any two) (2 × 10 = 20)

- (a) Describe the flow behaviour of Newtonian and Non-Newtonian systems with suitable examples and graphs. (10)
- (b) Discuss different methods for determination of flow properties of powders. How flow properties of powders can be improved? (6 + 4 = 10)
- (c) Write short note on: (Any two) (5 + 5 = 10)
 - (i) Acceleration stability testing.
 - (ii) Optical properties of colloids
 - (iii) DLVO theory.