Hard Multiple Choice Questions – Emulsions

1. Which statement best describes an emulsion?

A) A homogeneous mixture of two miscible liquids

B) A suspension of solids in liquids

C) A system of two immiscible liquids where one is dispersed as droplets in the other

D) A colloidal gas dispersed in liquid

2. In a water-in-oil emulsion, the continuous phase is:

A) Water

B) Oil

C) Alcohol

D) Gelatin

3. Which test is commonly used to identify the type of emulsion based on conductivity?

A) Dye reduction test

B) pH test

C) Electrical conductivity test

D) Viscosity test

4. Creaming in emulsions usually occurs in:

A) W/O emulsions

B) O/W emulsions

C) Multiple emulsions only

D) Microemulsions

5. According to Stoke's law, creaming can be reduced by:

A) Increasing globule size

B) Reducing viscosity

C) Increasing density difference

D) Reducing globule diameter

6. Coalescence in emulsions refers to:

A) Formation of foam

B) Fusion of droplets forming larger droplets

C) Sedimentation of particles

D) Gel formation

7. Which process is considered irreversible in emulsions?

A) Creaming

B) Sedimentation

C) Coalescence

D) Shaking

8. The ideal globule size for a stable emulsion is approximately:

A) 1–3 μm

B) 20–40 μm

C) 50–100 μm

D) 0.5 mm

9. A homogenizer primarily improves emulsion stability by:

A) Increasing pH

B) Reducing droplet size

C) Adding preservatives

D) Changing density

10. Which hydrocolloid is preferred for extemporaneous oral emulsions?

A) Pectin

B) Acacia

C) Carrageenan

D) Starch

11. Tragacanth is mainly used to:

A) Reduce taste

B) Increase viscosity

C) Act as a preservative

D) Decrease density

12. Which surfactant is classified as an anionic emulsifier?

A) Cetrimide

B) Polysorbate 80

C) Sodium lauryl sulfate

D) Benzalkonium chloride

13. Cationic surfactants are generally most stable at:

A) Neutral pH

B) Acidic pH

C) Alkaline pH

D) High temperature

14. Which surfactant group is highly resistant to pH changes?

A) Anionic

B) Cationic

C) Non-ionic

D) Amphoteric

15. An HLB value between 3 and 6 usually favors formation of:

A) O/W emulsions

B) W/O emulsions

C) Foams

D) Suspensions

16. An emulsifying agent with a high HLB number is generally:

A) Lipophilic

B) Hydrophobic

C) Hydrophilic

D) Insoluble

17. Which of the following may cause phase inversion?

A) Low viscosity

B) Decrease in disperse phase concentration

C) Excess disperse phase volume

D) Shaking

18. Phase inversion is best described as:

A) A reversible process

B) Conversion of one emulsion type to another

C) A type of sedimentation

D) A filtration process

19. Which emulsifier may also function as an antimicrobial preservative?

A) Acacia

B) Cetrimide

C) Starch

D) Pectin

20. Natural polysaccharides are limited by:

A) High toxicity

B) Lack of viscosity

C) Batch variability and microbial contamination

D) Poor taste only

21. Which statement about non-ionic surfactants is correct?

A) They are incompatible with cationic compounds

B) They are unsuitable for internal use

C) They may form either O/W or W/O emulsions

D) They are effective only in alkaline pH

22. Which preservative is effective below pH 5?

A) Phenoxyethanol

B) Benzoic acid

C) Benzyl alcohol

D) Chlorocresol

23. The major reason preservatives are needed in emulsions is:

A) To increase viscosity

B) To reduce density

C) To prevent microbial growth

D) To improve taste

24. Which route commonly uses W/O emulsions for depot therapy?

A) IV

B) Oral

C) IM

D) Topical

25. Total parenteral nutrition commonly utilizes:

A) Sterile O/W emulsions

B) Dry powders

C) W/O emulsions

D) Suspensions

26. Which factor increases the likelihood of coalescence?

A) High viscosity

B) Reduced globule movement

C) Creaming

D) Small droplet size

27. What happens to water during freezing that may destabilize emulsions?

A) It contracts

B) It evaporates

C) It expands

D) It ionizes

28. Which finely divided solid is commonly used as an emulsifier?

A) Bentonite

B) Glucose

C) Sucrose

D) Lactose

29. If particles are preferentially wetted by oil, they form:

A) O/W emulsions

B) W/O emulsions

C) Foams

D) Gels

30. Which property should an ideal emulsifying agent possess?

A) Strong odor

B) High toxicity

C) Non-irritancy

D) Dark color

31. Which emulsifier is considered too sticky for external use?

A) Acacia

B) PVA

C) HPMC

D) Carbopol

32. Which statement about creaming is TRUE?

A) It is irreversible

B) It cannot be corrected

C) It may lead to inaccurate dosing

D) It destroys the interfacial film immediately

33. Which type of surfactant possesses antimicrobial activity?

A) Non-ionic

B) Cationic

C) Amphoteric

D) Neutral

34. Polysorbates belong to which surfactant category?

A) Anionic

B) Cationic

C) Non-ionic

D) Zwitterionic

35. The major role of emulsifying agents is to:

A) Increase droplet fusion

B) Decrease stability

C) Prevent coalescence

D) Reduce solubility

36. Which of the following can decrease the rate of creaming?

A) Lower viscosity

B) Larger droplets

C) Smaller droplets

D) Higher density difference

37. Which route benefits from emulsions by masking oiliness and unpleasant taste?

A) Oral route

B) Rectal route

C) IV route

D) Topical route

38. Which emulsifier type forms a mechanical interfacial barrier?

A) Hydrocolloids

B) Surfactants

C) Emulsifying agents generally

D) All of the above

39. Which surfactant is incompatible with large organic cations such as cetrimide?

A) Non-ionic surfactants

B) Anionic surfactants

C) Amphoteric surfactants

D) Poloxamers

40. Increasing temperature may destabilize emulsions because it:

A) Increases viscosity

B) Reduces droplet collisions

C) Decreases viscosity and disrupts interfacial films

D) Stops Brownian motion

Answer Key

1. C
2. B
3. C
4. B
5. D
6. B
7. C
8. A
9. B
10. B
11. B
12. C
13. B
14. C
15. B
16. C
17. C
18. B
19. B
20. C
21. C
22. B
23. C
24. C
25. A
26. C
27. C
28. A
29. B

30. C
31. A
32. C
33. B
34. C
35. C
36. C
37. A
38. D
39. B
40. C