PHB Education

Government Exam and D. Pharm Exit Exam Preparation Questions Bank

Subject: Pharmaceutics

Chapter 6 : Mixing

Section 1: Introduction to Mixing

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1. Mixing is the process of —

   A) Combining two or more substances uniformly

   B) Grinding substances

   C) Heating materials

   D) Drying powders

   Answer: A) Combining two or more substances uniformly

2. The main objective of mixing is to —

   A) Achieve homogeneity

   B) Separate components

   C) Increase viscosity

   D) Reduce size

   Answer: A) Achieve homogeneity

3. Mixing is a type of —

   A) Unit operation

   B) Unit process

   C) Chemical reaction

   D) Biological process

   Answer: A) Unit operation

4. Mixing in pharmaceuticals is used for —

   A) Powders

   B) Semi-solids

   C) Liquids

   D) All of the above

   Answer: D) All of the above

5. The equipment used for mixing of **powders** is —

   A) Double cone blender

   B) Ribbon blender

   C) Planetary mixer

   D) All of the above

   Answer: D) All of the above

6. Mixing ensures —
   A) Uniform distribution of ingredients
   B) Faster dissolution
   C) Better product quality
   D) All of the above
   Answer: D) All of the above
7. Mixing can be classified as —
   A) Solid-solid
   B) Solid-liquid
   C) Liquid-liquid
   D) All of the above
   Answer: D) All of the above
8. Mixing efficiency is affected by —
   A) Particle size
   B) Density difference
   C) Moisture content
   D) All of the above
   Answer: D) All of the above
9. The uniformity of mixing is expressed as —
   A) Coefficient of variation
   B) Hardness
   C) pH
   D) Solubility
   Answer: A) Coefficient of variation
10. Ideal mixing gives —
    A) Perfect homogeneity
    B) Stratification
    C) Segregation
    D) None
    Answer: A) Perfect homogeneity

Section 2: Principles of Mixing

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11. The main principle of mixing involves —
    A) Diffusion
    B) Convection

C) Shear

D) All of the above

Answer: D) All of the above

12. **Diffusion mixing** occurs due to —

A) Random movement of particles

B) Stirring

C) Rotation

D) Shear stress

Answer: A) Random movement of particles

13. **Convective mixing** involves —

A) Bulk movement of particles

B) Random motion

C) Shear forces

D) Compression

Answer: A) Bulk movement of particles

14. **Shear mixing** involves —

A) Layer sliding

B) Diffusion

C) Vibration

D) Centrifugal action

Answer: A) Layer sliding

15. Mixing efficiency depends on —

A) Time

B) Speed

C) Nature of materials

D) All of the above

Answer: D) All of the above

16. Segregation during mixing occurs due to —

A) Size difference

B) Density difference

C) Electrostatic charge

D) All of the above

Answer: D) All of the above

17. Overmixing may lead to —

A) Demixing

B) Better homogeneity

C) Reduced viscosity

D) None

Answer: A) Demixing

18. Mixing of **solids** is usually slower than mixing of —

A) Liquids

B) Gases

C) Both A and B

D) None

Answer: C) Both A and B

19. In liquids, mixing is achieved by —

A) Turbulence

B) Diffusion

C) Shear

D) All of the above

Answer: D) All of the above

20. **Homogeneity** is achieved when —

A) Composition is uniform throughout

B) Phases are separated

C) Solvent evaporates

D) Stirring stops

Answer: A) Composition is uniform throughout

Section 3: Double Cone Blender

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21. Double cone blender is used for mixing —

A) Free-flowing powders

B) Liquids

C) Semisolids

D) Suspensions

Answer: A) Free-flowing powders

22. Double cone blender works on the principle of —

A) Diffusion

B) Convection

C) Shear

D) Centrifugal force

Answer: A) Diffusion

23. The shape of the double cone blender is —

A) Two cones joined at a base

B) Cylindrical

C) Conical

D) Rectangular

Answer: A) Two cones joined at a base

24. The double cone blender rotates —

A) About a horizontal axis

B) About a vertical axis

C) Randomly

D) None

Answer: A) About a horizontal axis

25. The blender provides —

A) Gentle mixing

B) Violent agitation

C) Crushing

D) Milling

Answer: A) Gentle mixing

26. Mixing time in double cone blender depends on —

A) Speed

B) Angle of rotation

C) Load

D) All of the above

Answer: D) All of the above

27. Double cone blenders are made of —

A) Stainless steel

B) Glass

C) Plastic

D) Wood

Answer: A) Stainless steel

28. The capacity of a double cone blender is usually —

A) 50–1000 L

B) 10–20 L

C) 5–10 L

D) 1–5 L

Answer: A) 50–1000 L

29. The **critical speed** of blender should be —

A) Below 50 rpm

B) 100 rpm

C) 200 rpm

D) Above 500 rpm

Answer: A) Below 50 rpm

30. Double cone blender gives —

A) Uniform mixing without segregation

B) Rapid shear

C) Homogenization

D) Emulsification

Answer: A) Uniform mixing without segregation

31. Overloading in double cone blender leads to —

A) Poor mixing

B) High friction

C) Powder breakage

D) All of the above

Answer: D) All of the above

32. A **baffle** is used in a double cone blender to —

A) Break lumps

B) Improve mixing

C) Prevent powder layering

D) All of the above

Answer: D) All of the above

33. Double cone blender is not suitable for —

A) Sticky materials

B) Free-flowing powders

C) Dry powders

D) Granules

Answer: A) Sticky materials

34. Double cone blender is commonly used in —

A) Pharmaceutical and food industry

B) Textile industry

C) Petroleum industry

D) None

Answer: A) Pharmaceutical and food industry

35. Advantage of double cone blender —

A) Easy cleaning

B) Simple design

C) Low maintenance

D) All of the above

Answer: D) All of the above

Section 4: Triple Roller Mill

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36. Triple roller mill is used for —

A) Ointments and creams

B) Powders

C) Liquids

D) Capsules

Answer: A) Ointments and creams

37. It works on the principle of —

A) Shear force

B) Centrifugal action

C) Impact

D) Diffusion

Answer: A) Shear force

38. The triple roller mill consists of —

A) Three horizontally placed rollers

B) Two vertical rollers

C) Four rollers

D) None

Answer: A) Three horizontally placed rollers

39. The rollers rotate —

A) At different speeds

B) At the same speed

C) In one direction only

D) None

Answer: A) At different speeds

40. The **main function** of the triple roller mill is —

A) To reduce particle size and mix semisolids

B) To dry solids

C) To sterilize

D) To cool ointments

Answer: A) To reduce particle size and mix semisolids

41. The **gap** between rollers can be adjusted to control —

A) Fineness

B) Homogeneity

C) Both

D) None

Answer: C) Both

42. The materials pass through —

A) Narrow gaps between rollers

B) A sieve

C) Blades

D) Screens

Answer: A) Narrow gaps between rollers

43. The rollers are made of —

A) Hard chrome or stainless steel

B) Wood

C) Plastic

D) Rubber

Answer: A) Hard chrome or stainless steel

44. Triple roller mill provides —

A) Uniform dispersion

B) Homogeneous mixture

C) Smooth texture

D) All of the above

Answer: D) All of the above

45. Overheating during operation may cause —

A) Product degradation

B) Better mixing

C) Color improvement

D) None

Answer: A) Product degradation

46. Cooling can be achieved by —

A) Water circulation

B) Air cooling

C) Both

D) None

Answer: C) Both

47. The triple roller mill is mainly used for —

A) Semisolid dosage forms

B) Powders

C) Tablets

D) Liquids

Answer: A) Semisolid dosage forms

48. It is **not suitable** for —

A) Liquids

B) Sticky masses

C) Coarse powders

D) All of the above

Answer: A) Liquids

49. The **distance between rollers** is usually —

A) 5–50 µm

B) 1–10 cm

C) 0.5–1 mm

D) 0.1–0.5 cm

Answer: A) 5–50 µm

50. The product is collected —

A) After passing between all three rollers

B) Before first roller

C) After first gap

D) None

Answer: A) After passing between all three rollers

Section 5: Turbine Mixer

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51. Turbine mixer is used for mixing —

A) Liquids and semisolids

B) Gases

C) Solids

D) Powders only

Answer: A) Liquids and semisolids

52. It works on the principle of —

A) Convective mixing and shear

B) Centrifugal action

C) Impact

D) Diffusion

Answer: A) Convective mixing and shear

53. The impeller in a turbine mixer is —

A) Circular disc with blades

B) Cylindrical roller

C) Paddle

D) Fan

Answer: A) Circular disc with blades

54. The turbine mixer creates —

A) Turbulence

B) Laminar flow

C) Static flow

D) None

Answer: A) Turbulence

55. It provides —

A) Efficient mixing in low-viscosity liquids

B) Gentle mixing

C) No movement

D) Layering

Answer: A) Efficient mixing in low-viscosity liquids

56. The number of blades in a turbine impeller ranges from —

A) 4 to 8

B) 10 to 15

C) 1 to 2

D) 20 to 25

Answer: A) 4 to 8

57. The material of construction of impeller —

A) Stainless steel

B) Wood

C) Plastic

D) Iron

Answer: A) Stainless steel

58. The turbine mixer is commonly used for —

A) Emulsions and suspensions

B) Powders

C) Granules

D) Capsules

Answer: A) Emulsions and suspensions

59. The power requirement depends on —

A) Viscosity of liquid

B) Impeller diameter

C) Mixing speed

D) All of the above

Answer: D) All of the above

60. **Baffles** are used to —

A) Prevent vortex formation

B) Reduce turbulence

C) Increase segregation

D) None

Answer: A) Prevent vortex formation

Section 6: Silverson Mixer Homogenizer

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61. Silverson mixer homogenizer works on —

A) High shear mixing

B) Centrifugal force

C) Impact

D) Diffusion

Answer: A) High shear mixing

62. It is used for —

A) Emulsification

B) Homogenization

C) Suspension

D) All of the above

Answer: D) All of the above

63. The main parts of Silverson mixer are —

A) Stator and rotor

B) Two cones

C) Three rollers

D) Two blades

Answer: A) Stator and rotor

64. The **rotor** rotates at —

A) High speed

B) Low speed

C) Constant low RPM

D) Random speed

Answer: A) High speed

65. The **stator** remains —

A) Stationary

B) Rotating

C) Movable

D) Detachable

Answer: A) Stationary

66. The working principle is based on —

A) Centrifugal and shear forces

B) Compression

C) Diffusion

D) Gravity

Answer: A) Centrifugal and shear forces

67. Silverson mixer homogenizer produces —

A) Uniform emulsion

B) Homogeneous cream

C) Smooth suspension

D) All of the above

Answer: D) All of the above

68. It is widely used in —

A) Pharmaceutical and cosmetic industries

B) Food industry

C) Paint industry

D) All of the above

Answer: D) All of the above

69. The **speed** of rotation is usually —

A) 3000–8000 rpm

B) 100–300 rpm

C) 10–20 rpm

D) 50–100 rpm

Answer: A) 3000–8000 rpm

70. The Silverson mixer is used for —

A) Liquid–liquid and solid–liquid mixing

B) Solid–solid mixing

C) Gas–gas mixing

D) None

Answer: A) Liquid–liquid and solid–liquid mixing

Section 7: Applications and Comparisons

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71. Double cone blender → Used for —

A) Dry powders

B) Liquids

C) Suspensions

D) Solutions

Answer: A) Dry powders

72. Triple roller mill → Used for —

A) Ointments

B) Powders

C) Capsules

D) Liquids

Answer: A) Ointments

73. Turbine mixer → Used for —

A) Emulsions

B) Powders

C) Granules

D) None

Answer: A) Emulsions

74. Silverson homogenizer → Used for —

A) High-shear emulsification

B) Powder mixing

C) Solid segregation

D) None

Answer: A) High-shear emulsification

75. The **main difference** between turbine and Silverson mixer is —

A) Degree of shear

B) Construction

C) Speed

D) All of the above

Answer: D) All of the above

76. Homogenization is mainly used for —

A) Reducing droplet size

B) Crushing solids

C) Mixing gases

D) Drying

Answer: A) Reducing droplet size

77. Double cone blender provides —

A) Diffusion mixing

B) Convective mixing

C) Shear mixing

D) Turbulent mixing

Answer: A) Diffusion mixing

78. Turbine mixer provides —

A) Convective and shear mixing

B) Diffusion

C) Rolling

D) Centrifugal

Answer: A) Convective and shear mixing

79. Triple roller mill gives —

A) Smooth semisolid product

B) Dry powder

C) Emulsion

D) None

Answer: A) Smooth semisolid product

80. Silverson homogenizer ensures —

A) Fine droplet dispersion

B) High viscosity

C) Reduced evaporation

D) None

Answer: A) Fine droplet dispersion

Section 8: Advantages and Limitations

81. Advantage of double cone blender —
    A) Gentle mixing
    B) Low energy consumption
    C) Easy cleaning
    D) All of the above
    Answer: D) All of the above
82. Limitation of double cone blender —
    A) Not suitable for cohesive powders
    B) Overmixing possible
    C) Low shear
    D) All of the above
    Answer: D) All of the above
83. Advantage of triple roller mill —
    A) Fine dispersion
    B) Uniform texture
    C) Adjustable gap
    D) All of the above
    Answer: D) All of the above
84. Limitation of triple roller mill —
    A) Cleaning difficulty
    B) Heat generation
    C) Limited throughput
    D) All of the above
    Answer: D) All of the above
85. Advantage of turbine mixer —
    A) Good liquid mixing
    B) Effective at low viscosity
    C) Easy scale-up
    D) All of the above
    Answer: D) All of the above
86. Limitation of turbine mixer —
    A) Ineffective for high-viscosity fluids
    B) Energy intensive

C) Vortex formation

D) All of the above

Answer: D) All of the above

87. Advantage of Silverson homogenizer —

A) High shear

B) Uniform emulsions

C) Rapid mixing

D) All of the above

Answer: D) All of the above

88. Limitation of Silverson homogenizer —

A) High cost

B) Not suitable for abrasive materials

C) Requires power

D) All of the above

Answer: D) All of the above

Section 9: Practical Aspects

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89. Double cone blender is operated at —

A) 20–25 rpm

B) 100 rpm

C) 500 rpm

D) 1000 rpm

Answer: A) 20–25 rpm

90. Triple roller mill's speed ratio of rollers —

A) 1 : 2 : 3

B) 1 : 1 : 1

C) 3 : 2 : 1

D) 2 : 3 : 1

Answer: A) 1 : 2 : 3

91. Turbine mixer impeller diameter is usually —

A) 1/3 of tank diameter

B) Equal to tank diameter

C) 1/10 of tank diameter

D) None

Answer: A) 1/3 of tank diameter

92. Silverson rotor–stator clearance is —

A) 0.2–0.5 mm

B) 2–5 mm

C) 5–10 mm

D) 0.01 mm

Answer: A) 0.2–0.5 mm

93. Triple roller mill gives —

A) Fine ointment base

B) Powder granules

C) Suspension

D) None

Answer: A) Fine ointment base

94. Turbine mixer requires —

A) Baffles in tank

B) Heating coil

C) Pressure control

D) Filter

Answer: A) Baffles in tank

95. Double cone blender requires —

A) Slow rotation

B) High shear

C) Ultrasonic mixing

D) High temperature

Answer: A) Slow rotation

96. Silverson homogenizer is mainly used for —

A) Creams and lotions

B) Tablets

C) Powders

D) Capsules

Answer: A) Creams and lotions

97. Triple roller mill is cleaned using —

A) Solvent and scraper

B) Water only

C) Vacuum

D) Ultrasonic bath

Answer: A) Solvent and scraper

98. Mixing ensures —

A) Uniformity of dosage

B) Consistency

C) Product stability

D) All of the above

Answer: D) All of the above

99. Improper mixing may cause —

A) Dose variation

B) Product instability

C) Separation

D) All of the above

Answer: D) All of the above

100. Mixing operation is essential in —

A) All dosage forms

B) Only solids

C) Only liquids

D) None

Answer: A) All dosage forms