

- (A) Immiscible liquids of different
- (B) Miscible liquids of different
- (C) Immiscible liquids of same
- (D) Miscible liquids of same

Answer: Option A

03. Which of the following is not used as filter aid?

- (A) Asbestos
- (B) Diatomaceous earth
- (C) Purified wood cellulose
- (D) Rice husk

Answer: Option D

04. To get a fine talc powder from its granules, the equipment used is

- (A) Roller crusher
- (B) Ball mill
- (C) Jaw crusher
- (D) Gyratory crusher

Answer: Option B

05. Which of the following mechanical conveyors does not come under the division 'carriers'?

- (A) Belt conveyor
- (B) Bucket elevator
- (C) Screw conveyor
- (D) Apron conveyor

Answer: Option C

06. As per Taggart's formula, the capacity (kg/hr) of Jaw & Gyratory crushers (for gapes of 10 to 60 cms) is equal to (where, L = Length of feed opening, cms S = Maximum width of discharge opening, cms).

- (A) LS
- (B) $93 LS$
- (C) $250 LS$
- (D) \sqrt{LS}

Answer: Option B

07. Particle size range in which dust catcher (gravity settling chamber) works most effectively and efficiently is _____ microns.

- (A) < 5
- (B) 10 to 25
- (C) < 74
- (D) > 1000

Answer: Option C

08. With increase in the capacity of screens, the screen effectiveness

- (A) Remains unchanged
- (B) Increases
- (C) Decreases
- (D) Decreases exponentially

Answer: Option C

09. Height of liquid in agitation tank is normally maintained equal to the tank diameter. However, if the tank is too tall and a large liquid hold up is desired, then two or more impellers mounted on the same shaft may be used. The clearance between the tank bottom and the bottom most impeller should be about (where, D = impeller diameter)

- (A) $0.5 D$
- (B) D
- (C) $1.5 D$
- (D) $2 D$

Answer: Option B

10. Filtration of water in a paper mill is done by a/an _____ filter.

- (A) Open sand
- (B) Plate and frame
- (C) Vacuum leaf

(D) Sparkler
Answer: Option A

11. Angle of nip of the crushing rolls does not depend upon the

- (A) Diameter of the rolls
- (B) Speed of the rolls
- (C) Product size
- (D) Feed size

Answer: Option B

12. Reciprocal of sphericity is termed as the

- (A) Specific surface ratio
- (B) Shape factor
- (C) Sauter diameter
- (D) Surface area per unit mass

Answer: Option B

13. Which of the following grinding mills has the horizontally arranged rods as the grinding elements thereby delivering more uniform granular products with minimum fines?

- (A) Compartment mill
- (B) Rod mill
- (C) Pebble mill
- (D) Tube mill

Answer: Option B

14. As particle size is reduced

- (A) Screening becomes progressively more difficult
- (B) Screening becomes progressively easier
- (C) Capacity and effectiveness of the screen is increased
- (D) None of these

Answer: Option A

15. Flow of filtrate through the cake in a plate and frame filter press is best described by the _____ equation.

- (A) Kozeny-Carman
- (B) Hagen-Poiseuille's
- (C) Fanning's
- (D) Kremser

Answer: Option A

16. Which of the following achieves the least reduction ratio for a given feed size?

- (A) Jaw crusher
- (B) Roll crusher
- (C) Cone crusher
- (D) Gyratory crusher

Answer: Option B

17. Filtrate flow rate in case of a rotary drum vacuum filter (in which $R_m \ll R_c$) is proportional to _____ and the cycle time (where, μ = filtrate viscosity R_m = filter medium resistance R_c = cake resistance).

- (A) $\sqrt{\mu}$
- (B) $1/\sqrt{\mu}$
- (C) $1/\mu$
- (D) $1/\mu^2$

Answer: Option B

18. Size measurement of ultrafine particles can be best expressed in terms of

- (A) Centimetre
- (B) Screen size
- (C) Micron
- (D) Surface area per unit mass

Answer: Option D

19. Which of the following agitators having a large blade area, rotating at slow speed is used for mixing high viscosity liquids (> 50000 centipoise)?

- (A) Propeller
- (B) Helical screw
- (C) Flat blade turbine
- (D) Curved blade turbine

Answer: Option B

20. Rittinger number which designates the new surface produced per unit of mechanical energy absorbed by the material being crushed, depends on the

- (A) State or manner of application of the crushing force
- (B) Ultimate strength of the material
- (C) Elastic constant of the material
- (D) All (A), (B) and (C)

Answer: Option D

21. The specific surface of spherical particles is proportional to (where, D_p = diameter of particle).

- (A) D_p^2
- (B) D_p
- (C) $1/D_p$
- (D) $1/D_p^2$

Answer: Option C

22. During filtration operation, the filtrate encounters the resistance of the

- (A) Filter medium
- (B) Cake
- (C) Channel carrying the slurry to the upstream side of the cake and filtrate away from the filter medium
- (D) All (A), (B) and (C)

Answer: Option D

23. Separation of materials of the same density based on their sizes by using then-different rates of flow is called

- (A) Sorting
- (B) Sizing
- (C) Flocculation
- (D) Elutriation

Answer: Option B

24. _____ is the most suitable for compounding rubber and plastic solids.

- (A) Banbury mixer
- (B) Pan mixer
- (C) Pug mill
- (D) Charge can mixer

Answer: Option A

25. Pick out the wrong statement:

- (A) Magnetic separation method can be employed to treat both dry & wet ores
- (B) Reduction ratio in crushing operation is defined as the ratio of minimum feed size to the maximum product size
- (C) Gyratory crusher is used for coarse crushing
- (D) Screens are of stationary, moving and vibratory types

Answer: Option B

26. What is the reduction ratio in a fine crushing operation having following feed and product sizes?

Parameters	Unit	Maximum	Minimum
Feed size	mm	20	10
Product size	mm	10	5

- (A) 0.5
- (B) 2
- (C) 5
- (D) 10

Answer: Option B

27. Dust collection efficiency of electrostatic precipitator can be as high as 99.9%. Maximum temperature and pressure of dust laden gas that can be cleaned in an electrostatic precipitator is respectively.

- (A) 200°C and 5 atm
- (B) 1000°C and 10 atm
- (C) 500°C and 50 atm
- (D) 1000°C and 500 atm

Answer: Option B

28. For a sphere falling in the constant drag co-efficient regime, its terminal velocity depends on its diameter (D) as

- (A) d
- (B) \sqrt{d}
- (C) d^2
- (D) $1/d$

Answer: Option C

29. Energy consumed for crushing one ton of material ranges from _____ kWh.

- (A) 0.01 to 0.1
- (B) 0.5 to 1.5
- (C) 2 to 3.5
- (D) 4 to 5

Answer: Option B

30. Pick out the wrong statement.

- (A) For the compressible cake, voidage & the specific resistance of the cake can be assumed to be constant
- (B) Cake resistance is independent of the pressure drop
- (C) Crushing of explosive materials are done by employing dry-grinding
- (D) Gyrotory crusher is a coarse crusher

Answer: Option B

31. Sphericity of raschig ring (whose length and diameter are equal) is

- (A) > 1
- (B) < 1
- (C) 1
- (D) 2

Answer: Option C

32. For efficient grinding, ball mills must be operated

- (A) At a speed less than the critical speed
- (B) At a speed more than the critical speed
- (C) At a speed equal to the critical speed
- (D) With minimum possible small balls

Answer: Option A

33. Which of the following gives the crushing energy required to create new surface ?

- (A) Taggart's rule
- (B) Fick's law
- (C) Rittinger's Law
- (D) None of these

Answer: Option C

34. Rittinger's number designates the new surface created per unit mechanical energy absorbed by the material being crushed. Larger value of Rittinger's number of a material indicates its

- (A) Easier grindability
- (B) Poor grindability
- (C) High power consumption in grinding
- (D) None of these

Answer: Option A

35. The most suitable filter for the removal of very small amount of precipitate from very large volumes of water is the _____ filter.

- (A) Vacuum
- (B) Sand

- (C) Plate & frame
 - (D) Rotary
- Answer: Option B

36. Carbon black is pulverised in a

- (A) Hammer crusher
- (B) Ball mill
- (C) Roll crusher
- (D) Gyratory crusher

Answer: Option B

37. Higher is the mesh number, smaller will be the aperture size of the screen. It means that the aperture size of a 200 mesh screen will be smaller than that of 20 mesh screen. This is valid for

- (A) British standard screens
- (B) German standard screens (DIN 1171) etc
- (C) American standard screens (ASTM and Tyler standard screens)
- (D) All (A), (B) and (C)

Answer: Option D

38. Which of the following is a vacuum filter?

- (A) Filter press
- (B) Rotary disc filter
- (C) Batch basket centrifuge
- (D) Tank filter (Nutsche filter)

Answer: Option B

39. In a size reduction crushing operation, feed size is 300 to 1500 mm while the product size is 100 to 300 mm. This is a case of the _____ crushing.

- (A) Secondary
- (B) Fine
- (C) Primary
- (D) Ultrafine

Answer: Option C

40. A fluid energy mill is used for

- (A) Cutting
- (B) Grinding
- (C) Ultra grinding
- (D) Crushing

Answer: Option C

41. _____ centrifuge is the most suitable for separation of non-friable crystals.

- (A) Tubular bowl
- (B) Disc-bowl
- (C) Perforated horizontal basket continuous
- (D) Suspended batch basket

Answer: Option C

42. Which of the following is the most suitable filter for separation of abrasive solids suspended in a corrosive liquid?

- (A) Sand bed filter
- (B) Plate and frame filter press
- (C) Vacuum filter
- (D) Batch basket centrifuge

Answer: Option C

43. Laminar flow region is said to exist during agitation of a liquid in an agitator, when the value of Reynolds number is

- (A) > 10
- (B) < 10
- (C) > 100
- (D) < 100

Answer: Option B

44. The specific cake resistance for incompressible sludges is (where ΔP = pressure drop over cake)

- (A) $\propto \Delta P$
- (B) $\propto 1/\Delta P$
- (C) $\propto \sqrt{\Delta P}$
- (D) Independent of ΔP

Answer: Option D

45. A _____ employs a set of screen across a flow channel for the separation of dirt/rust from a flowing liquid stream.

- (A) Thickener
- (B) Classifier
- (C) Strainer
- (D) Clarifier

Answer: Option C

46. Filtration capacity of a rotary drum vacuum filter depends upon the

- (A) Cake thickness
- (B) Characteristics of the feed slurry
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

47. At low Reynold's number, the power (P) required for agitating a fluid in a stirred tank becomes independent of inertial forces. In this limit, indicate which of the following relations is satisfied:

$P_o = \rho \omega^3 D^5$: Power number

$Re = \rho N D^2 / \mu$: Reynold's number

N is the impeller rotational speed, and D is the impeller diameter.

- (A) $P_o \propto Re^{-1.0}$
- (B) $P_o \propto Re^{0.0}$
- (C) $P_o \propto Re^{0.5}$
- (D) $P_o \propto Re^{1.0}$

Answer: Option B

48. Bond crushing law

- (A) Calls for relatively less energy for the smaller product particles, than does the Rittinger law
- (B) Is less realistic in estimating the power requirements of commercial crushers
- (C) States that the work required to form particle of any size from very large feed is proportional to the square root of the volume to surface ratio of the product
- (D) States that the work required for the crushing is proportional to the new surface created

Answer: Option A

49. The critical speed of a trommel (N) is related to its dia (D) as

- (A) $N \propto 1/\sqrt{D}$
- (B) $N \propto \sqrt{D}$
- (C) $N \propto D$
- (D) $N \propto 1/D$

Answer: Option A

50. Sphericity for a non-spherical particle is given by (where, V and S are volume and surface area respectively of one particle. and, D = equivalent diameter of particle).

- (A) $6.V/D.S$
- (B) $V/6D.S$
- (C) $D.S/V$
- (D) $V/D.S$

Answer: Option A

51. In screen analysis, the notation +5 mm/-10 mm means particles passing through

- (A) 10 mm screen and retained on 5 mm screen
- (B) 5 mm screen and retained on 10 mm screen
- (C) Both 5 mm and 10 mm screens
- (D) Neither 5 mm nor 10 mm screen

Answer: Option A

- 52. A straight line is obtained on plotting reciprocal of filtration rate vs. the volume of filtrate for _____ flow of filtrate.**
- (A) Compressible cakes and laminar
 - (B) Incompressible cake and laminar
 - (C) Compressible cake and turbulent
 - (D) Incompressible cake and turbulent
- Answer: Option B
- 53. Cement clinker is reduced to fine size by a**
- (A) Roll crusher
 - (B) Ball mill
 - (C) Tube mill
 - (D) Hammer mill
- Answer: Option C
- 54. Work index is the gross energy (kWh/tonne of feed) necessary to reduce a very large feed to such a size that 80% of product particles will pass through a 0.1 mm screen. The value of work index determined for wet grinding should be multiplied with _____ to get the same for dry grinding.**
- (A) 1.0
 - (B) 0.5
 - (C) 1.34
 - (D) 4.34
- Answer: Option C
- 55. Grinding efficiency of a ball mill is of the order of _____ percent.**
- (A) 1-5
 - (B) 40-50
 - (C) 75-80
 - (D) 90-95
- Answer: Option A
- 56. Which of the following is not used as a surface active agent in a flocculation operation?**
- (A) Sodium silicate
 - (B) Quartz
 - (C) Lime
 - (D) Alumina
- Answer: Option B
- 57. Separation of isotopes is generally done using a/an _____ centrifuge.**
- (A) Ultra
 - (B) Disk-bowl
 - (C) Both (A) & (B)
 - (D) Neither (A) nor (B)
- Answer: Option A
- 58. For transporting pasty material, one will use a/an**
- (A) Apron conveyor
 - (B) Belt conveyor
 - (C) Screw conveyor
 - (D) Bucket elevator
- Answer: Option C
- 59. Toothed roll crushers achieve size reduction by**
- (A) Tearing (shear) and compression
 - (B) Impact and attrition
 - (C) Both (A) & (B)
 - (D) Neither (A) nor (B)
- Answer: Option C
- 60. Dispersion of a gas through liquid is done by using a**
- (A) Sparger
 - (B) Kneader
 - (C) Masticator
 - (D) None of these

Answer: Option A

61. Agglomeration of individual particles into clusters (flocs) is called flocculation. To prevent flocculation, the most commonly used dispersing agents are

- (A) Carbonates
- (B) Sulphates
- (C) Silicates & phosphates
- (D) Bi-carbonates

Answer: Option C

62. The value of work index does not change materially from one equipment to another. If the value of work index determined for close circuit grinding is W_i , then the same for open circuit grinding will be

- (A) $0.5 W_i$
- (B) W_i
- (C) $1.34 W_i$
- (D) $3.34 W_i$

Answer: Option C

63. Capacity (in tons/hr) of jaw/gyratory crusher is equal to (where, L = length of the receiving opening, S = greater width of the discharge opening, cm).

- (A) $0.01 L.S$
- (B) $0.087 L.S$
- (C) $L.S$
- (D) $L.S/0.087$

Answer: Option B

64. Which of the following oxides is not present in hematite iron ore?

- (A) Titanium oxide
- (B) Calcium oxide
- (C) Cobalt oxide
- (D) Manganese oxide

Answer: Option C

65. Mixing mechanism employed in a pan mixer is by

- (A) Mulling
- (B) Kneading
- (C) Dispersion
- (D) None of these

Answer: Option A

66. In filtration, the use of 'filter aid' helps in

- (A) Reducing the filtration pressure
- (B) Accelerating the rate of filtration
- (C) Deplugging the filter medium
- (D) Enhancing the cake porosity in case of a dense impermeable cake

Answer: Option C

67. Length/diameter ratio of a ball mill is

- (A) 1.5
- (B) 1
- (C) < 1
- (D) > 1

Answer: Option C

68. Activators are those chemicals which help buoying up one mineral in preference to the other in the froth floatation process. Which of the following is an activator?

- (A) Cresylic acid
- (B) Copper sulphate
- (C) Calcium carbonate
- (D) Sodium carbonate

Answer: Option B

69. Which one is a filter aid?

- (A) Canvas fabric

- (B) Diatomaceous earth
 - (C) Calcined lime
 - (D) None of these
- Answer: Option B

70. The filtrate flow rate in constant pressure filtration

- (A) Continuously increases
 - (B) Continuously decreases
 - (C) Remain constant throughout
 - (D) May increase or decrease; depends on the pressure
- Answer: Option B

71. Pick out the wrong statement.

- (A) Cumulative analysis for determining surface area is preferred over differential analysis, because of the assumption that "all particles in a simple fraction equal in size" is not needed for cumulative analysis unlike differential analysis
 - (B) A gate diagram is a plot of cumulative percent by weight undersize vs. the reciprocal of diameter, in which the area beneath the curve represents the surface
 - (C) Capacity of crusher in choke feeding is increased
 - (D) Rolling of pebbles/balls from top to bottom of the heap in tumbling mills is called 'cascading' and throwing of the balls through the air to the toe of the heap is called 'cataracting'
- Answer: Option C

72. In case of a ball mill,

- (A) Coarse feed requires a larger ball
 - (B) Fine feed requires a larger ball
 - (C) Operating speed should be more than the critical speed
 - (D) None of these
- Answer: Option A

73. Shell and leaf filter as compared to plate and frame filter

- (A) Entails less labor cost
 - (B) Facilitates filtration under higher pressure
 - (C) Provides more effective washing
 - (D) All (A), (B) & (C)
- Answer: Option D

74. Separation of solid suspended in liquid into a supernatant clear liquid and a denser slurry employs a process termed as the

- (A) Coagulation
 - (B) Flocculation
 - (C) Sedimentation
 - (D) Clarification
- Answer: Option C

75. A propeller agitator

- (A) Produces mainly axial flow
 - (B) Is used for mixing high viscosity pastes
 - (C) Runs at very slow speed (2 rpm)
 - (D) All (A), (B) and (C)
- Answer: Option A

76. Gyratory crushers compared to the reciprocating jaw crushers

- (A) Have greater capacity per unit of discharge area
 - (B) Crush intermittently
 - (C) Are less suitable for coarse materials
 - (D) Have less steady power consumption
- Answer: Option A

77. Crushing efficiency is the ratio of the

- (A) Surface energy created by crushing to the energy absorbed by the solid
 - (B) Energy absorbed by the solid to that fed to the machine
 - (C) Energy fed to the machine to the surface energy created by crushing
 - (D) Energy absorbed by the solid to the surface energy created by crushing
- Answer: Option A

78. Pick out the wrong statement.

- (A) More commonly used jaw crusher between Dodge jaw crusher and Blake jaw crusher is the later one
- (B) There are only four methods namely compression, impact, attrition and cutting, which the size reduction equipments employ
- (C) Cutting machines mainly employ 'attrition' for size reduction of solids
- (D) Operating principles of Dodge and Blake jaw crushers are combined in the working of universal jaw crushers

Answer: Option C

79. Screen capacity is expressed in terms of

- (A) tons/hr
- (B) tons/ft²
- (C) Both (A) & (B)
- (D) tons/hr-ft²

Answer: Option D

80. Size reduction of ice and gypsum can be accomplished suitably by a _____ crusher.

- (A) Blake jaw
- (B) Toothed roll
- (C) Gyratory
- (D) None of these

Answer: Option B

81. General mechanism of size reduction in intermediate and fine grinder is by

- (A) Cutting action
- (B) Compression
- (C) Compression and tearing
- (D) Impact and attrition

Answer: Option D

82. _____ are used for the separation of coarse particles from a slurry of fine particles.

- (A) Thickeners
- (B) Classifiers
- (C) Hydrocyclones
- (D) Decanters

Answer: Option B

83. In a size reduction crushing operation, feed size is 100 to 300 mm. while the product size is 10 to 50 mm. This is a case of the _____ crushing.

- (A) Primary
- (B) Secondary
- (C) Fine
- (D) Ultrafine

Answer: Option B

84. Use of grinding aids results in the

- (A) Enhanced production rate
- (B) Finer products
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option D

85. Percentage of drum submerged in the slurry in case of rotary drum filter is

- (A) 3
- (B) 30
- (C) 85
- (D) 25

Answer: Option B

86. In a ball mill, the volume occupied by the balls (when the mill is stopped) is about _____ percent of the volume of the mill.

- (A) 35
- (B) 50

- (C) 70
- (D) 85

Answer: Option B

87. Where the density difference of the two liquid phase to be separated is very small (as in milk cream separator), the most suitable separator is a

- (A) Disc bowl centrifuge
- (B) Sharpies super-centrifuge
- (C) Batch basket centrifuge
- (D) Sparkler filter

Answer: Option A

88. Washability curve based on float and sink test enables an assessment to be made of the possibility of cleaning a coal fraction based on the

- (A) Density separation
- (B) Differential wettability
- (C) Size
- (D) Volatile matter content

Answer: Option A

89. The optimum moisture content in solids to be crushed/ground ranges from _____ percent.

- (A) 3 to 4
- (B) 8 to 10
- (C) 10 to 15
- (D) 15 to 20

Answer: Option A

90. Critical speed of rotation, N (in rps - rotation per second) of a trammel is equal to (where, g = acceleration due to gravity = 9.81 m/sec^2 and, r = radius of trammel, metre.)

- (A) $(1/2\pi) \cdot \sqrt{(g/r)}$
- (B) $(1/\pi) \cdot \sqrt{(g/r)}$
- (C) $1/2 \sqrt{(g/r)}$
- (D) $2\pi \cdot \sqrt{(g/r)}$

Answer: Option A

91. Critical Speed (N_c) of a ball mill is given by (where R_1 and R_2 are radii of ball mill and the ball respectively).

- (A) $N_c = (1/4\pi) \cdot \sqrt{(g/R_1 - R_2)}$
- (B) $N_c = (1/2\pi) \cdot \sqrt{(g/R_1 - R_2)}$
- (C) $N_c = (1/\pi) \cdot \sqrt{(g/R_1 - R_2)}$
- (D) $N_c = (1/2\pi) \cdot \sqrt{(R_1 - R_2/g)}$

Answer: Option B

92. General crushing equation is given by $d(P/m) = -K(d\bar{D}_s/\bar{D}^n_s)$. Bond's crushing law is obtained by solving this equation for $n =$ _____ and feed of infinite size.

- (A) 1
- (B) 1.5
- (C) 2
- (D) 2.5

Answer: Option B

93. Ribbon blenders are exclusively meant for

- (A) Blending miscible liquids
- (B) Non-flowing powder and thin pastes
- (C) Bath mixing
- (D) Continuous mixing

Answer: Option B

94. Removal of activated carbon from glycerine is done by

- (A) Plate and frame filter
- (B) Rotary vacuum filter
- (C) Batch basket centrifuge
- (D) None of these

Answer: Option A

95. Which of the following size reduction equipments employs mainly attrition for ultrafine grinding?

- (A) Jet mills
- (B) Fluid energy mill
- (C) Micronizer
- (D) All (A), (B) and (C)

Answer: Option D

96. The most suitable equipment for removing the fine dust particle (< 1 micron dia.) from air below its dew point will be a/an

- (A) Bag filter
- (B) Electrostatic precipitator
- (C) Cyclone separator
- (D) Wet scrubber

Answer: Option B

97. During agitation of liquids, the

- (A) Froude number is independent for the curves between power number and Reynolds number in baffled system
- (B) Power number becomes independent of impellers Reynolds number at high Reynolds number, but is dependent on the geometry of the impeller
- (C) Froude number is used to account for the effect of surface (e.g., the centre vortex) on the power number
- (D) All (A), (B) and (C)

Answer: Option D

98. Filtration operation carried out by continuous increase of the inlet pressure of slurry, is called the _____ filtration.

- (A) Constant rate
- (B) Varying pressure
- (C) Varying rate
- (D) Constant pressure

Answer: Option A

99. Chance process is used for the

- (A) Cleaning of coal
- (B) Concentration of iron ore
- (C) Concentration of pyrites
- (D) Water treatment

Answer: Option A

100. The important dimensional group involved in the power requirement calculation in mixing operation is the _____ number.

- (A) Reynold's
- (B) Froude
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

101. The controlling resistance in a rotary drum vacuum filter is the _____ resistance.

- (A) Piping
- (B) Cake
- (C) Filter medium
- (D) None of these

Answer: Option B

102. Separation of particles of various sizes, shapes and densities by allowing them to settle in a fluid is called

- (A) Classification
- (B) Froth floatation
- (C) Thickening
- (D) Clarification

Answer: Option A

103. Theoretical capacity of crushing rolls in tons/hr is given by (where, V = peripheral velocity, m/sec. W = width of rolls, m Dr = distance between rolls ρ = density of material to be crushed, kg/m³ here, $V = \pi ND$ where, N = speed of the rolls in rotation per second (rps) D = diameter of rolls, m).

- (A) $3.6 V.W.Dr.\rho$
- (B) $3.6 V.W. \rho$
- (C) $3.6 W.Dr.\rho$
- (D) $3.6 V.W.Dr/\rho$

Answer: Option A

104. Ore concentration by jigging is based on the difference in the _____ of the particles.

- (A) Specific gravities
- (B) Wettability
- (C) Shape
- (D) None of these

Answer: Option A

105. In a size reduction crushing operation, the feed size is 10 to 50 mm, while the product size is 2 to 10 mm. This is a case of _____ crushing.

- (A) Primary
- (B) Secondary
- (C) Fine
- (D) Ultrafine

Answer: Option C

106. Use of baffles in agitators help in minimising the _____ tendency.

- (A) Swirling
- (B) Vortexing
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

107. A fluid energy mill is used for

- (A) Cutting
- (B) Grinding
- (C) Ultra-grinding
- (D) Crushing

Answer: Option C

108. Actual operating speed of a ball mill may vary from 65 to 80% of the critical speed. Which of the following duties would require the ball mill to be operated at maximum percentage of critical speed?

- (A) Wet grinding in low viscous suspension
- (B) Wet grinding in high viscous suspension
- (C) Dry grinding of large particles (upto 1.25 cms)
- (D) Dry grinding of large particles in un-baffed mills

Answer: Option D

109. Reciprocating screens are normally inclined at an angle of 5° with the horizontal and employ gyratory motion at feed end & reciprocating motion at the discharge end. They are not suitable for the screening of the

- (A) Light metal powder down upto 4 mesh size
- (B) Dry chemicals
- (C) Heavy tonnages of rocks or gravel
- (D) Powdered food & granular materials

Answer: Option C

110. A tube mill compared to a ball mill

- (A) Has a higher length/diameter ratio
- (B) Produces a coarser product
- (C) Has a higher diameter/length ratio
- (D) Uses much larger balls

Answer: Option A

111. Gravity stamp mill is meant for the _____ crushing.

- (A) Primary
 - (B) Intermediate
 - (C) Fine
 - (D) Ultrafine
- Answer: Option C

112. Pick out the correct statement.

- (A) The capacity and the effectiveness of a screen are the same
- (B) The capacity and the effectiveness of screen are opposing factors
- (C) The screening surface of a 'reel' (a revolving screen used in flour mills) is made of silk bolting cloth supported by wire mesh
- (D) Both (B) and (C)

Answer: Option D

113. For spheres, the surface shape factor is given by (where, A = area, V = volume, and D = diameter)

- (A) $\pi = (A/D^2)$
- (B) $\pi/6 = (V/D^3)$
- (C) AD/V
- (D) None of these

Answer: Option A

114. Grizzlies are used for separating _____ solids.

- (A) Coarse
- (B) Fine
- (C) Any size
- (D) None of these

Answer: Option B

115. _____ mixer is used for devulcanisation of rubber scrap & making water dispersion & rubber solution.

- (A) Tumbler
- (B) Banbury
- (C) Muller
- (D) Ribbon blender

Answer: Option B

116. In closed circuit grinding as compared to open circuit grinding, the

- (A) Specific surface of product is more
- (B) Product has lesser size uniformity
- (C) Production rate at a given limiting size is lower
- (D) Operation is economical

Answer: Option D

117. Which of the following is a fine crusher?

- (A) Blake jaw crusher
- (B) Gyratory crusher
- (C) Toothed roll crusher
- (D) Dodge jaw crusher

Answer: Option C

118. In bag filters, filter fabrics are never made of

- (A) Metallic wire woven mesh
- (B) Polyester fibres
- (C) Cotton fibres
- (D) Nylon fibres

Answer: Option A

119. Maximum size reduction in a ball mill is done by the, _____ action.

- (A) Attrition
- (B) Compression
- (C) Impact
- (D) Cutting

Answer: Option C

120. For crushing of solids, the Rittinger's law states that the work required for crushing is proportional to

- (A) The new surface created
- (B) The size reduction ratio
- (C) The change in volume due to crushing
- (D) None of these

Answer: Option A

121. The reduction ratio for grinders is defined as (where, D_f and D_p are average diameters of feed and product respectively).

- (A) D_f/D_p
- (B) D_p/D_f
- (C) $D_f - D_p$
- (D) None of these

Answer: Option A

122. Which of the following screens has the maximum capacity?

- (A) Grizzlies
- (B) Trommels
- (C) Shaking screen
- (D) Vibrating screen

Answer: Option D

123. Sphericity of pulverised coal is

- (A) 1
- (B) < 1
- (C) > 1
- (D) ∞

Answer: Option B

124. For spheres, volume shape factor is given by

- (A) $\pi = (A/D^2)$
- (B) $2\pi = (2A/D^2)$
- (C) $\pi/6 = (V/D^3)$
- (D) AD/V

Answer: Option C

125. Gummy & sticky materials like molasses, sugar etc. are best transported/handled by using a _____ conveyor.

- (A) Drag
- (B) Ribbon
- (C) Screw
- (D) Slat

Answer: Option B

126. The inlet pressure in a constant rate filtration

- (A) Increases continuously
- (B) Decreases gradually
- (C) Remains constant
- (D) None of these

Answer: Option A

127. There is practically no alternative/competitor to _____ in the beneficiation treatment of sulphide ores.

- (A) Classification
- (B) Tabling
- (C) Jigging
- (D) Froth floatation

Answer: Option D

128. Trommels separate a mixture of particles depending on their

- (A) Size
- (B) Density
- (C) Wettability
- (D) Electrical & magnetic properties

Answer: Option A

129. Pick out the wrong statement pertaining to the turbine agitator.

- (A) Recommended peripheral speed for the turbine agitator is 200-250 metres/minute
- (B) Pitched blade turbine agitator gives only radial flow with complete absence of the axial flow
- (C) Generally, the diameter of the agitator is kept between 1/3rd to 1/6th of the tank diameter while the blade length is 1/4th of agitator diameter (with central disc, it is 1/8th of the agitator diameter)
- (D) Turbine agitator should be located at a height not less than one agitator diameter length from the bottom. If the depth of liquid in the tank is more than twice the agitator diameter, two agitators should be used

Answer: Option B

130. Close circuit grinding by a ball mill with air sweeping employs a

- (A) Classifier
- (B) Cyclone separator between mill & classifier
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

131. With increase in the pressure drop across the cake, the specific cake resistance for the compressible sludge

- (A) Increases
- (B) Decreases
- (C) Remains constant
- (D) Increases linearly

Answer: Option A

132. Which of the following clay mixing devices is vacuum operated for deairation of clay?

- (A) Banbury mixer
- (B) Pug mill
- (C) Muller-mixer
- (D) None of these

Answer: Option B

133. Which of the following mechanical conveyors does not come under the division 'scrapers'?

- (A) Ribbon conveyor
- (B) Flight conveyor
- (C) Bucket elevators
- (D) Drag conveyor

Answer: Option C

134. Pick out the correct statement.

- (A) Angle of repose is always greater than the angle of slide
- (B) A hopper is a small bin with a sloping bottom
- (C) A silo is a short height vessel of very large diameter used for the storage of high volatile matter coal
- (D) Pine oil is used as a 'modifying agent' (for activating or depressing the adsorption of filming agents) in froth floatation process

Answer: Option B

135. Which of the following is the softest material?

- (A) Talc
- (B) Feldspar
- (C) Corundum
- (D) Calcite

Answer: Option A

136. Introduction of slurry in a plate and frame filter press is done through a plate in each frame. The plate of this filter has a _____ surface.

- (A) Plane
- (B) Curved
- (C) Ribbed
- (D) Either (A) or (B)

Answer: Option C

137. All resistances during washing of cake

- (A) Increases
- (B) Decreases
- (C) Remain constant
- (D) None of these

Answer: Option C

138. Which is the most suitable conveyor for transportation of sticky material?

- (A) Apron conveyor
- (B) Belt conveyor
- (C) Screw conveyor
- (D) Pneumatic conveyor

Answer: Option C

139. Metallic wire mesh is used as a filtering medium for the separation of dust from dust laden gas in case of a/an

- (A) Air filter
- (B) Bag filter
- (C) Venturi scrubber
- (D) Hydrocyclones

Answer: Option A

140. In classification, particles are said to be equal settling, if they have the same terminal velocities in the

- (A) Different fluids
- (B) Same fluid
- (C) Same field of force
- (D) Both (B) and (C)

Answer: Option D

141. Dry powdery solid materials are transported by a _____ conveyor.

- (A) Belt
- (B) Bucket
- (C) Screw
- (D) None of these

Answer: Option C

142. The work index in Bond's law for crushing of solids has the following dimensions

- (A) No units (dimensionless)
- (B) kWh/ton
- (C) kW/ton
- (D) kWh.m^{1/2}/ton

Answer: Option B

143. Which of the following is used for primary crushing of very hard lumpy materials?

- (A) Toothed roll crusher
- (B) Gyratory crusher
- (C) Ball mill
- (D) Tube mill

Answer: Option B

144. Which of the following minerals is not subjected to magnetic separation method?

- (A) Rutile
- (B) Galena
- (C) Chromite
- (D) Siderite

Answer: Option B

145. Fluid energy mill comes in the category of

- (A) Grinder
- (B) Crusher
- (C) Cutter
- (D) Ultrafine grinder

Answer: Option D

146. Stamp mills are generally used for crushing

- (A) Iron ores
- (B) Gold ores
- (C) Talc
- (D) Diamond

Answer: Option B

147. Molten ammonium nitrate is mixed with ground limestone in fertilizer plant in a

- (A) Pug mill
- (B) Mixer-extruder
- (C) Banbury mixer
- (D) Muller mixer

Answer: Option A

148. Basic slag is not ground in

- (A) Jaw crushers
- (B) Ball mills
- (C) Compartment mills
- (D) Tube mills

Answer: Option A

149. Wheat is ground into flour in a

- (A) Hammer crusher
- (B) Roller crusher
- (C) Impact mill
- (D) Fluid energy mill

Answer: Option B

150. For beneficiation of iron ore, the most commonly used method is

- (A) Flocculation
- (B) Froth floatation
- (C) Jigging & tabling
- (D) None of these

Answer: Option C

151. Pick out the material having minimum Rittinger's number.

- (A) Calcite
- (B) Pyrite
- (C) Quartz
- (D) Galena

Answer: Option C

152. Sphericity of a cubical particle, when its equivalent diameter is taken as the height of the cube, is

- (A) 0.5
- (B) 1
- (C) $\sqrt{2}$
- (D) $\sqrt{3}$

Answer: Option B

153. About 2-3 hp, power per gallon of a thin liquid provides vigorous agitation in an agitator. 'Power number' in agitation is given by

- (A) $P. g_c/n^3. D^2. \rho$
- (B) $P. g_c. \rho/\mu^2$
- (C) $n^3. D^3. \rho/P. g_c$
- (D) $P. g_c/n^2. D^2. \rho$

Answer: Option A

154. Gelatinous solid (which plug the septum) can be filtered by a _____ filter.

- (A) Sparkler
- (B) Plate and frame
- (C) Vacuum leaf
- (D) Pre-coat

Answer: Option D

155. A filter press is

- (A) A batch filter
- (B) Not suitable, if the liquid is the main product
- (C) Having prohibitively high maintenance cost
- (D) Not suitable for wide range of materials under varying operating conditions of cake thickness and pressure

Answer: Option A

156. _____ conveyor is the most suitable for short distance transportation of non-abrasive loose materials like garbage, grain, food wastes etc.

- (A) Flight
- (B) Screw
- (C) Drag
- (D) Belt

Answer: Option A

157. The crushed material received for separation is called feed or

- (A) Tailing
- (B) Heading
- (C) Concentrate
- (D) Middling

Answer: Option B

158. Sorting classifiers employing differential settling methods for separation of particles make use of the differences in their

- (A) Particle sizes
- (B) Densities
- (C) Terminal velocities
- (D) None of these

Answer: Option C

159. _____ mill is not a revolving mill.

- (A) Pebble
- (B) Compartment
- (C) Cage
- (D) Tube

Answer: Option C

160. _____ conveyors are also called scrapers.

- (A) Apron
- (B) Screw
- (C) Helical flight
- (D) Both (B) & (C)

Answer: Option D

161. Which of the following equations is Rittinger's crushing law? (Where P = power required by the machine, m = feed rate, k = a constant, \bar{D}_{sa} & \bar{D}_{sb} = volume surface mean diameter of feed & product respectively.)

- (A) $P/m = K/\sqrt{D_p}$
- (B) $P/m = K \cdot \ln \bar{D}_{sa}/\bar{D}_{sb}$
- (C) $P/m = K \cdot (1/\bar{D}_{sb} - 1/\bar{D}_{sa})$
- (D) None of these

Answer: Option C

162. Fibrous material is broken by a

- (A) Roll-crusher
- (B) Squirrel-cage disintegrator
- (C) Ball mill
- (D) Tube mill

Answer: Option B

163. For coarse reduction of hard solids, use

- (A) Impact
- (B) Attrition

- (C) Compression
 - (D) Cutting
- Answer: Option C

164. Work index is defined as the

- (A) Gross energy (kWh/ton of feed) needed to reduce very large feed to such a size that 80% of the product passes through a 100 micron screen
- (B) Energy needed to crush one tonne of feed to 200 microns
- (C) Energy (kWh/ton of feed) needed to crush small feed to such a size that 80% of the product passes a 200 mesh screen
- (D) Energy needed to crush one ton of feed to 100 microns

Answer: Option A

165. _____ mills are termed as impactors.

- (A) Hammer
- (B) Cage
- (C) Rolling-compression
- (D) None of these

Answer: Option A

166. Grindability of a material does not depend upon its

- (A) Elasticity
- (B) Hardness
- (C) Toughness
- (D) Size

Answer: Option D

167. During the washing of cake

- (A) All the resistances are constant
- (B) Filter medium resistance increases
- (C) Filter medium resistance decreases
- (D) Cake resistance decreases

Answer: Option A

168. In case of a plate and frame filter press, filtrate flow through the cake follows _____ flow.

- (A) Plug
- (B) Turbulent
- (C) Laminar
- (D) None of these

Answer: Option C

169. For laminar flow of filtrate through the cake deposited on septum, which of the following will be valid?

- (A) Kozeny-Carman equation
- (B) Leva's equation
- (C) Blake-Plummer equation
- (D) None of these

Answer: Option A

170. A _____ mixer resembles a ball mill without balls.

- (A) Banbury
- (B) Pug mill
- (C) Tumbling
- (D) Pan

Answer: Option C

171. Feed size of ≥ 25 cms can be accepted by

- (A) Ball mill
- (B) Rod mill
- (C) Fluid energy mill
- (D) Jaw crusher

Answer: Option D

172. Which of the following is a coarse crusher?

- (A) Smooth roll crusher
 - (B) Toothed roll crusher
 - (C) Gyratory crusher
 - (D) Tube mill
- Answer: Option C

173. In a grinding operation, the limiting particle size is the size of the _____ particle in the sample.

- (A) Smallest
 - (B) Largest
 - (C) Either (A) or (B)
 - (D) Neither (A) nor (B)
- Answer: Option D

174. The reduction ratio for fine grinders is

- (A) 5-10
 - (B) 10-20
 - (C) 20-40
 - (D) As high as 100
- Answer: Option D

175. The power number for a stirred tank becomes constant at high Reynolds number. In this limit, the variation of power input with impeller rotational speed (N) is proportional to

- (A) N^0
 - (B) N^1
 - (C) N^2
 - (D) N^3
- Answer: Option C

176. Filtration should be stopped in a filter press, if the

- (A) Cake becomes very dense
 - (B) Liquor stops flowing out to the discharge
 - (C) Filtration pressure rises suddenly
 - (D) Both (B) & (C)
- Answer: Option D

177. Which of the following is a continuous filter?

- (A) Plate and frame filter
 - (B) Cartridge filter
 - (C) Shell and leaf filter
 - (D) None of these
- Answer: Option D

178. Xanthates are used in the froth floatation process as a/an

- (A) Conditioner
 - (B) Frother
 - (C) Collector
 - (D) Activator
- Answer: Option C

179. In case of a revolving mill, wet grinding compared to dry grinding

- (A) Requires more energy
 - (B) Has less capacity
 - (C) Complicates handling & classification of the product
 - (D) None of these
- Answer: Option D

180. The operating speed of a ball mill should be _____ the critical speed.

- (A) Less than
 - (B) Much more than
 - (C) At least equal to
 - (D) Slightly more than
- Answer: Option A

181. The opening of a 200 mesh screen (Taylor series) is

- (A) 0.0074 cm
 - (B) 0.0074 mm
 - (C) 0.0047 cm
 - (D) 74 milli-microns
- Answer: Option A

182. Filtration rate does not depend upon the

- (A) Pressure drop & area of filtering surface
- (B) Resistance of the cake & the septum
- (C) Properties of the cake & the filtrate
- (D) None of these

Answer: Option D

183. Rittinger's crushing law states that

- (A) Work required to form a particle of any size is proportional to the square of the surface to volume ratio of the product
- (B) Work required to form a particle of a particular size is proportional to the square root of the surface to volume ratio of the product
- (C) Work required in crushing is proportional to the new surface created
- (D) For a given machine and feed, crushing efficiency is dependent on the size of the feed & product

Answer: Option C

184. Shape factor for a cylinder whose length equals its diameter is

- (A) 1.5
- (B) 0.5
- (C) 1.0
- (D) 2.0

Answer: Option A

185. Paddle agitator

- (A) Is suitable for mixing low viscosity liquids
- (B) Produces axial flow
- (C) Moves at very high speed
- (D) None of these

Answer: Option A

186. Which of the following is a batch sedimentation equipment?

- (A) Dust catcher
- (B) Filter thickener
- (C) Dry cyclone separator
- (D) Rotary sprayer scrubber

Answer: Option B

187. During washing of filter at the end of constant pressure filtration, the rate of washing equals the rate of filtration

- (A) At time zero
- (B) At the end of filtration
- (C) When half the filtrate has been obtained
- (D) At the end of filtration, but decreases with time subsequently

Answer: Option B

188. Cyclones are used primarily for separating

- (A) Solids
- (B) Solids from fluids
- (C) Liquids
- (D) Solids from solids

Answer: Option B

189. Ball mill is used for

- (A) Crushing
- (B) Coarse grinding
- (C) Fine grinding
- (D) Attrition

Answer: Option C

190. Traces of liquid tar fog present in coke oven gas is separated using

- (A) Electrostatic precipitator
- (B) Cyclone separator
- (C) Strainer
- (D) None of these

Answer: Option A

191. Size reduction of moulding powders, waxes, resins & gums are done in a _____ mill.

- (A) Cage
- (B) Hammer
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

192. For a cyclone of diameter 0.2 m with a tangential velocity of 15 m/s at the wall, the separation factor is

- (A) 2250
- (B) 1125
- (C) 460
- (D) 230

Answer: Option D

193. _____ is defined as the geometric mean of the relative rejections and the relative recoveries of two minerals.

- (A) Separation efficiency
- (B) Selectivity index
- (C) Concentration ratio
- (D) None of these

Answer: Option B

194. Separation of solid particles based on their densities is called

- (A) Sizing
- (B) Sorting
- (C) Clarification
- (D) Dispersion

Answer: Option B

195. rpm of a trommel at critical speed is given by (where, D = Diameter of trommel in ft)

- (A) $76.65/D$
- (B) $76.65/\sqrt{D}$
- (C) $76.65/D^2$
- (D) $76.75 \sqrt{D}$

Answer: Option B

196. Pick out the wrong statement.

- (A) Hammer crushers operate by impact action
- (B) Standard screens have circular opening
- (C) With increase in mesh number of screens, their diameter in microns decreases
- (D) 200 mesh screen has 200 openings per linear cm

Answer: Option D

197. Which is a secondary crusher for a hard & tough stone?

- (A) Jaw crusher
- (B) Cone crusher
- (C) Impact crusher
- (D) Toothed roll crusher

Answer: Option B

198. Dust laden air can be purified using a

- (A) Cyclone separator
- (B) Bag filter
- (C) Gravity settler
- (D) Tubular centrifuge

Answer: Option A

199. Soft & non-abrasive materials can be made into fines by

- (A) Attrition
- (B) Compression
- (C) Cutting
- (D) None of these

Answer: Option A

200. For the transportation of ultrafine particles, the equipment used is a _____ conveyor.

- (A) Belt
- (B) Pneumatic
- (C) Screw
- (D) None of these

Answer: Option B

201. Width and speed of a conveyor belt depends upon the _____ of the material.

- (A) Lump size
- (B) Bulk density
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

202. Coal is finally pulverised to 200 mesh size for burning in boilers by a

- (A) Hammer crusher
- (B) Ball mill
- (C) Roll crusher
- (D) Gyratory crusher

Answer: Option B

203. Optimum ratio of operating speed to critical speed of a trommel is

- (A) 0.33-0.45
- (B) 1.33-1.45
- (C) 0.5-2
- (D) 1.5-2.5

Answer: Option A

204. _____ are mixed using ribbon blenders.

- (A) Lumpy solids and low viscosity liquids
- (B) Dry powders
- (C) High viscosity liquids
- (D) Thick pastes

Answer: Option B

205. The capacity of a gyratory crusher is _____ that of a jaw crusher with the same gape, handling the same feed & for the same product size range.

- (A) Same as
- (B) 2.5 times
- (C) 5 times
- (D) 10 times

Answer: Option B

206. Reduction ratio of crushers is the

- (A) Ratio of feed opening to discharge opening
- (B) Ratio of discharge opening to feed opening
- (C) Determining factor for minimum dia of the feed and the product
- (D) None of these

Answer: Option A

207. Vacuum is applied in _____ zone, in case of a general type continuous rotary drum vacuum filter.

- (A) Filtering
- (B) Washing
- (C) Drying
- (D) All (A), (B) & (C)

Answer: Option D

208. Which of the following is not a revolving/tumbling mill used for size reduction?

- (A) Compartment mill
- (B) Pebble mill
- (C) Cage mill
- (D) Rod mill

Answer: Option C

209. The most suitable equipment for the transportation of 200 mesh size particles is a

- (A) Bucket elevator
- (B) Pneumatic conveyor
- (C) Screw conveyor
- (D) Belt conveyor

Answer: Option B

210. Tank filter (e.g., Nutsche filter) is

- (A) A high pressure filter
- (B) A continuous filter
- (C) Used for small scale filtration work
- (D) A leaf filter

Answer: Option C

211. increasing the capacity of a screen _____ the screen effectiveness.

- (A) Decreases
- (B) Increases
- (C) Does not effect
- (D) None of these

Answer: Option A

212. The process opposite to 'dispersion' is termed as the

- (A) Flocculation
- (B) Sedimentation
- (C) Filtration
- (D) None of these

Answer: Option A

213. The process by which fine solids is removed from liquids is termed as

- (A) Decantation
- (B) Flocculation
- (C) Sedimentation
- (D) Classification

Answer: Option C

214. Screen capacity is proportional to (where, S = screen aperture)

- (A) S
- (B) $1/S$
- (C) S^2
- (D) \sqrt{S}

Answer: Option A

215. Which of the following is the hardest material?

- (A) Calcite
- (B) Quartz
- (C) Corundum
- (D) Gypsum

Answer: Option C

216. Screen capacity is not a function of

- (A) Its openings size
- (B) Screening mechanism
- (C) Screening surface
- (D) Atmospheric humidity

Answer: Option D

217. In constant pressure filtration,

- (A) Resistance decreases with time
- (B) Rate of filtration is constant
- (C) Rate of filtration increases with time
- (D) Rate of filtration decreases with time

Answer: Option D

218. Limestone is normally crushed in a

- (A) Roll crusher
- (B) Hammer crusher
- (C) Ball mill
- (D) Tube mill

Answer: Option B

219. Use of 'grinding aids' is done in _____ grinding.

- (A) Dry
- (B) Wet
- (C) Ultrafine
- (D) Intermediate

Answer: Option A

220. The resistance offered by the filter used in a bag filter is proportional to (where, c = dust concentration, and s = particle size).

- (A) c/s
- (B) s/c
- (C) $s \cdot c$
- (D) $1/s \cdot c$

Answer: Option A

221. Which of the following crushing laws is most accurately applicable to the fine grinding of materials?

- (A) Bond's crushing law
- (B) Kick's law
- (C) Rittinger's law
- (D) None of these

Answer: Option C

222. The cake resistance increases steadily with the time of filtration in a plate and frame filter employing constant _____ filtration.

- (A) Rate
- (B) Pressure
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

223. _____ is a cohesive solid.

- (A) Wheat
- (B) Sand
- (C) Wet clay
- (D) None of these

Answer: Option C

224. Temperature of the product during ultrafine grinding

- (A) Increases
- (B) Decreases
- (C) Remain constant
- (D) May increase or decrease; depends on the material being ground

Answer: Option A

225. Pine oil used in froth floatation technique acts as a/an

- (A) Collector
- (B) Modifier
- (C) Frother
- (D) Activator

Answer: Option C

226. To produce talcum powder, use

- (A) Ball mill
- (B) Hammer mill
- (C) Jet mill
- (D) Pin mill

Answer: Option A

227. Raw materials are charged in the iron blast furnace using

- (A) Bucket elevator
- (B) Skip hoist
- (C) Screw conveyor
- (D) None of these

Answer: Option B

228. Solid particles of different densities are separated by

- (A) Filters
- (B) Thickness
- (C) Cyclones
- (D) Sorting classifier

Answer: Option D

229. As the product becomes finer, the energy required for grinding

- (A) Decreases
- (B) Increases
- (C) Is same as for coarser grinding
- (D) Is 1.5 times that for coarser grinding

Answer: Option B

230. Moore filter is a _____ filter.

- (A) Leaf
- (B) Press
- (C) Rotary
- (D) Sand

Answer: Option A

231. Choke crushing (in case of a Jaw crusher) compared to free crushing

- (A) Results in increased capacity
- (B) Consumes less power
- (C) Consumes more power
- (D) Both (A) and (C)

Answer: Option C

232. In coal washeries, three products namely the valuable product (i.e. clean/washed coal), discarded product (i.e. mineral matter) and an additional concentrated product called _____ is produced.

- (A) Concentrate
- (B) Tailing
- (C) Middling
- (D) None of these

Answer: Option C

233. Mechanical conveyors which push the material along an endless trough or tube are called scrappers. Which of the following conveying equipments comes under the category of 'scrappers'?

- (A) Bucket conveyor
- (B) Flight conveyor
- (C) Screw conveyor
- (D) Both (B) and (C)

Answer: Option D

234. During agitation of liquids, power consumption during laminar flow is not proportional to the

- (A) Density of the liquid
- (B) Viscosity of the liquid
- (C) Cube of impeller diameters

(D) Square of rotational speed

Answer: Option A

235. Arrange the following size reduction equipment in the decreasing order of the average particle size produced by each of them.

(A) Jaw crusher, Ball mill, Fluid energy mill

(B) Ball mill, Jaw crusher, Fluid energy mill

(C) Fluid energy mill, Jaw crusher, Ball mill

(D) Fluid energy mill, Ball mill, Jaw crusher

Answer: Option A

236. The main differentiation factor between tube mill and ball mill is the

(A) Length to diameter ratio

(B) Size of the grinding media

(C) Final product size

(D) Operating speed

Answer: Option A

237. Additives used for promoting the flocculation of particles is a/an

(A) Electrolyte

(B) Surface active agent

(C) Both (A) & (B)

(D) Neither (A) nor (B)

Answer: Option C

238. For sizing of fine materials, the most suitable equipment is a

(A) Trommel

(B) Grizzly

(C) Shaking screen

(D) Vibrating screen

Answer: Option D

239. For separation of sugar solution from settled out mud, we use a _____ filter.

(A) Sparkler

(B) Plate and frame

(C) Centrifugal

(D) Rotary drum vacuum

Answer: Option C

240. The specific surface of spherical particles is given by (where D and ρ are diameter and density of particle).

(A) $6/D.\rho$

(B) $2/D.\rho$

(C) $4/D.\rho$

(D) $12/D.\rho$

Answer: Option A

241. The most efficient equipment for the removal of sub-micronic dust particles from blast furnace gas is the

(A) Venturi atomiser

(B) Gravity settling chamber

(C) Electro-static precipitator

(D) Cyclone separator

Answer: Option C

242. Trommels are revolving screens which normally operate in the range of _____ rpm.

(A) 1 - 2

(B) 15 - 20

(C) 40 - 50

(D) 60 - 75

Answer: Option B

243. The maximum slope of a belt conveyor can be

(A) 15°

(B) 30°

- (C) 45°
- (D) 60°

Answer: Option B

244. Filter aids like asbestos, kieselguhr, diatomaceous earth etc. are used to increase the porosity of the final filter cake & reducing the cake resistance during filtration. Filter aid is

- (A) Added to the feed slurry
- (B) Pre-coated on the filter medium prior to filtration
- (C) Separated from the cake by dissolving solids or by burning it off
- (D) All 'a', 'b' & 'c'

Answer: Option D

245. _____ balls capable of grinding the feed in a ball mill gives the maximum efficiency.

- (A) Cast iron
- (B) Minimum size
- (C) Maximum size
- (D) Elliptical

Answer: Option B

246. Pick out the correct statement.

- (A) Plastic chips are called non-cohesive solids
- (B) Kick's crushing law is, $P/m = K \cdot \ln(\bar{D}_{sa}/\bar{D}_{sb})$
- (C) Communion is a generic term for size enlargement operation
- (D) Energy required in kwh per ton of product, such that 80% of it passes through a 200 mesh screen, is called 'Work index'

Answer: Option B

247. A belt conveyor used for the transportation of materials can

- (A) Run upto 1 km
- (B) Travel at a speed upto 300 metres/minute
- (C) Handle materials upto 5000 tons/hr
- (D) All (A), (B) and (C)

Answer: Option D

248. Ultracentrifuges running at speeds upto 100000 rpm is normally used for the

- (A) Separation of isotopes based on their density or molecular weights difference
- (B) Concentration of rubber latex
- (C) Separation of cream from milk
- (D) Dewaxing of lubricating oil

Answer: Option A

249. Which of the following is the most suitable for handling fibrous and dense slurries?

- (A) Propeller agitator
- (B) Cone type agitator
- (C) Turbine agitator
- (D) Radial propeller agitator

Answer: Option B

250. Maximum size reduction in a fluid energy mill is achieved by

- (A) Compression
- (B) Interparticle attrition
- (C) Cutting
- (D) Impact

Answer: Option B

251. According to Bond crushing law, the work required to form particle of size 'D' from very large feed is (where $(S/V)_p$ and $(S/V)_f$ are surface to volume ratio of the product and feed respectively).

- (A) $(S/V)_p$
- (B) $\sqrt{(S/V)_p}$
- (C) $(S/V)_p^2$
- (D) $(S/V)_f$

Answer: Option B

252. Which of the following is not a wet classifier?

- (A) Sharpies super-centrifuge
- (B) Hydrocyclones
- (C) Dorr Oliver rake classifier
- (D) None of these

Answer: Option D

253. Vibrating screens are used for handling large tonnages of materials. The vibrating motion is imparted to the screening surface by means of

- (A) Electromagnets
- (B) Cams or eccentric shafts
- (C) Unbalanced flywheels
- (D) Either (A), (B) or (C)

Answer: Option D

254. Size reduction of fibrous materials like wood, asbestos, mica etc. is done by a disintegrator exemplified by the

- (A) Blake jaw crusher
- (B) Cage mill
- (C) Stamp mill
- (D) Bradford's breaker

Answer: Option B

255. Number of particles in a crushed solid sample is given by (where, m = mass of particles in a sample, V_p = volume of one particle, ρ = density of particles)

- (A) $m/\rho \cdot V_p$
- (B) $m \cdot \rho/V_p$
- (C) $m \cdot V_p/\rho$
- (D) $V_p/m \cdot \rho$

Answer: Option A

256. Specific surface area is the surface area of a unit _____ of materials.

- (A) Weight
- (B) Volume
- (C) Either (A) or (B)
- (D) Neither (A) nor (B)

Answer: Option C

257. The cumulative mass fraction of particles smaller than size d_j for a collection of N_i particles of diameter d_i and mass m_i ($i = 1, 2, 3, \dots, \infty$) is given by

(A)
$$\frac{\sum_{i=1}^j N_i d_i^3}{\sum_{i=1}^{\infty} N_i d_i^3}$$

(B)
$$\frac{\sum_{i=1}^j N_i m_i d_i^3}{\sum_{i=1}^{\infty} N_i m_i d_i^3}$$

(C)
$$\frac{\sum_{i=1}^j N_i m_i d_i^2}{\sum_{i=1}^{\infty} N_i m_i d_i^2}$$

(D)
$$\frac{\sum_{i=1}^j N_i m_i d_j}{\sum_{i=1}^{\infty} N_i m_i d_i}$$

Answer: Option B

258. Ultrafine grinders operate principally by

- (A) Slow compression
- (B) Impact
- (C) Attrition
- (D) Cutting action

Answer: Option C

259. Separation of a suspension or slurry into a supernatant clear liquid (free from particles) and a thick sludge containing a high concentration of solid is called

- (A) Classification
 - (B) Sedimentation
 - (C) Clarification
 - (D) Decantation
- Answer: Option B

260. Sauter mean diameter is the same as the _____ mean diameter.

- (A) Mass
 - (B) Arithmetic
 - (C) Volume-surface
 - (D) Geometric
- Answer: Option C

261. If a force greater than that of gravity is used to separate solids & fluids of different densities, the process is termed as the

- (A) Sedimentation
 - (B) Flocculation
 - (C) Dispersion
 - (D) Centrifugation
- Answer: Option D

262. Rod mills employed for grinding

- (A) Employ a steel shell having L/D ratio of 1.5 to 3.0
 - (B) Is useful for handling sticky materials
 - (C) Employ steel rods of 2-12 cms diameter extending over full length of the mill
 - (D) All 'a', 'b' & 'c'
- Answer: Option D

263. In ball mill operation, the feed size (D_f in meters) and the ball diameter (D_b in metres) are related as (where, K = grindability constant (varying from 0.9 to 1.4 in increasing order of hardness))

- (A) $D_b^2 = K.D_f$
 - (B) $D_b = K.D_f$
 - (C) $D_b^3 = K.D_f$
 - (D) $D_b^2 = K.D_f^2$
- Answer: Option A

264. The ratio of the actual mesh dimension of Taylor series to that of the next smaller screen is

- (A) 2
- (B) $\sqrt{2}$
- (C) 1.5
- (D) $\sqrt{3}$

Answer: Option B

265. Crushing efficiency of a machine ranges between _____ percent.

- (A) 0.1 to 2
- (B) 5 to 10
- (C) 20 to 25
- (D) 50 to 70

Answer: Option A

266. The energy consumed by a ball mill depends on

- (A) Its speed
- (B) Its ball load
- (C) The density of the material being ground
- (D) All (A), (B) and (C)

Answer: Option D

267. Pick out the correct statement:

- (A) Removal of iron from ceramic material is necessitated (by magnetic separation method) so as to avoid discolouration of ceramic products
- (B) The operating cost of shaking screen is more than that of a vibrating screen
- (C) Screen capacity does not depend upon the specific gravity of the minerals
- (D) Asphalt is best crushed using toothed roll crusher

Answer: Option A

268. Size reduction of asbestos and mica is done by

- (A) Hammer mills
- (B) Rod mills
- (C) Gyratory crushers
- (D) Crushing rolls

Answer: Option A

269. _____ baffles are provided in ball mills.

- (A) Horizontal
- (B) No
- (C) Only two
- (D) None of these

Answer: Option A

270. In case of a hammer crusher, the final product size depends on the

- (A) Feed rate
- (B) Rotor speed
- (C) Clearance between hammer & grinding plates
- (D) All (A), (B) and (C)

Answer: Option D

271. To remove very small amount of tiny solid impurities from liquid, we use a

- (A) Pressure filter
- (B) Vacuum filter
- (C) Centrifugal filter
- (D) Coagulant

Answer: Option D

272. Tube mill compared to ball mill

- (A) Produces finer products
- (B) Is long in comparison with its diameter
- (C) Uses smaller balls
- (D) All (A), (B) & (C)

Answer: Option D

273. In case of a hammer crusher,

- (A) Crushing takes place by impact breaking
- (B) Maximum acceptable feed size is 30 cms
- (C) Reduction ratio can be varied by adjusting the distance from cage to hammers
- (D) All (A), (B) and (C)

Answer: Option D

274. Tabling process used for separating two materials of different densities by passing the dilute pulp over a table/deck, which is inclined from the horizontal surface at an angle of about

- (A) 1 to 2°
- (B) 2 to 5°
- (C) 5 to 10°
- (D) 10 to 15°

Answer: Option B

275. Screen efficiency is

- (A) Recovery/rejection
- (B) Recovery
- (C) Rejection
- (D) None of these

Answer: Option D

276. To get ultrafine particles, the equipment used is a

- (A) Ball mill
- (B) Rod mill
- (C) Hammer crusher
- (D) Fluid energy mill

Answer: Option D

277. Short distance transportation of grain, gravel, sand, ash, asphalt etc. is done by using a _____ conveyor.

- (A) Flight
- (B) Slat or drag
- (C) Ribbon
- (D) Screw

Answer: Option D

278. Kick's law assumes that the energy required for size reduction is proportional to the logarithm of the ratio between the initial and the final diameters. The unit of Kick's constant is

- (A) kW. sec/kg
- (B) kWh/kg
- (C) kWh/sec. kg
- (D) kg/sec

Answer: Option A

279. For a turbine agitated and baffled tank, operating at low Reynold's number (based on impeller diameter), the power number (N_p) varies with N_{Re} as

- (A) $N_p \propto N_{Re}$
- (B) $N_p \propto \sqrt{N_{Re}}$
- (C) $N_p \rightarrow \text{constant}$
- (D) $N_p \propto 1/N_{Re}$

Answer: Option D

280. Filtration rate through a filter cake is proportional to (where, S = filtering surface R = specific cake resistance μ = viscosity of the filtrate)

- (A) S
- (B) $1/R$
- (C) $1/\mu$
- (D) All (A), (B) & (C)

Answer: Option D

281. The capacity of a classifier in 'tons of solid/hr' is given by (where, A = cross-sectional area in m^2 , V = rising velocity of fluid in m/sec, S = percentage of solids in the suspension by volume, ρ = density of solids in kg/m^3)

- (A) $3.6 AVS \cdot \rho$
- (B) $3.6 A \cdot V \cdot \rho$
- (C) $3.6 A \cdot S \cdot \rho$
- (D) $3.6 AVS/\rho$

Answer: Option A

282. In continuous filtration (at a constant pressure drop), filtrate flow rate varies inversely as the

- (A) Square root of the velocity
- (B) Square of the viscosity
- (C) Filtration time only
- (D) Washing time only

Answer: Option A

283. Out of the following size reduction equipments, the maximum feed size can be accepted by the

- (A) Tube mill
- (B) Ball mill
- (C) Jaw crusher
- (D) Jet pulveriser

Answer: Option C

284. The sphericity of a solid particle of cubical shape is

- (A) π
- (B) $(\pi/6)^{1/3}$
- (C) $(\pi/6)^{1/2}$
- (D) $\pi/3$

Answer: Option B

285. During size reduction by a jaw crusher, the energy consumed decreases with the

- (A) Decreasing size of product at constant size of feed
 - (B) Decreasing machine capacity
 - (C) Increasing size of feed at constant reduction ratio
 - (D) None of these
- Answer: Option C

286. To remove dirt from the flowing fluid, we use a

- (A) Coagulant
 - (B) Gravity settler
 - (C) Strains
 - (D) Clarifier
- Answer: Option C

287. Pebble mills are tumbling mills widely used for grinding in the manufacture of paints & pigments and cosmetic industries, where iron contamination in the product is highly objectionable. Pebbles used in pebble mill are made of

- (A) Bronze
 - (B) Stainless steel
 - (C) Flint or porcelain
 - (D) Concrete
- Answer: Option C

288. The most suitable equipment used to devulcanise rubber scrap and to make water dispersion & rubber solution is a

- (A) Boundary mixer
 - (B) Propeller agitator
 - (C) Sharpies centrifuge
 - (D) None of these
- Answer: Option A

289. The mechanism of size reduction by a hammer mill is by impact and attrition between the

- (A) Grinding element & the housing
 - (B) Feed particles
 - (C) Both (A) and (B)
 - (D) Neither (A) nor (B)
- Answer: Option C

290. Which of the following may prove unsuitable for filtering volatile liquids?

- (A) Pressure filter
 - (B) Gravity filter
 - (C) Centrifugal filter
 - (D) Vacuum filter
- Answer: Option D

291. Solid particles separation based on the difference in their flow velocities through fluids is termed as the

- (A) Clarification
 - (B) Classification
 - (C) Elutriation
 - (D) Sedimentation
- Answer: Option B

292. A screen is said to be blinded, when the

- (A) Over-sizes are present in undersize fraction
 - (B) Under-sizes are retained in oversize fraction
 - (C) Screen is plugged with solid particles
 - (D) Screen capacity is abruptly increased
- Answer: Option C

293. Size reduction mechanism used in Jaw crushers is

- (A) Attrition
 - (B) Compression
 - (C) Cutting
 - (D) Impact
- Answer: Option B

294. Wet grinding in a revolving mill _____ as compared to dry grinding.

- (A) Gives less wear on chamber walls
- (B) Requires more energy
- (C) Increases capacity
- (D) Complicates handling of the product

Answer: Option C

295. Wet sieving is employed, when the product contains _____ materials.

- (A) Abrasive
- (B) Large quantity of very fine
- (C) Coarse
- (D) Non-sticky

Answer: Option B

296. Which of the following is not a part of the Blake jaw crusher?

- (A) Hanger
- (B) Check plates
- (C) Toggles
- (D) Pitman

Answer: Option A

297. According to Taggart's rule for selecting between a gyratory crusher and a jaw crusher; the later should be used, if the hourly tonnage to be crushed divided by the square of the gape expressed in cm is less than

- (A) 0.00184
- (B) 0.0184
- (C) 0.184
- (D) 1.84

Answer: Option B

298. Float and sink test determines the possibility of cleaning of coal by a process based on the

- (A) Gravity separation
- (B) Wettability
- (C) Particle shape
- (D) None of these

Answer: Option A

299. What is the critical rotation speed in revolutions per second, for a ball mill of 1.2 m diameter charged with 70 mm dia balls?

- (A) 0.5
- (B) 1.0
- (C) 2.76
- (D) 0.66

Answer: Option D

300. Cumulative analysis for determining surface is more precise than differential analysis, because of the

- (A) Assumption that all particles in a single fraction are equal in size
- (B) Fact that screening is more effective
- (C) Assumption that all particles in a single fraction are equal in size, is not needed
- (D) None of these

Answer: Option C

301. The energy required per unit mass to grind limestone particles of very large size to 100 μm is 12.7 kWh/ton. An estimate (using Bond's law) of the energy to grind the particles from a very large size to 50 μm is

- (A) 6.35 kWh/ton
- (B) 9.0 kWh/ton
- (C) 18 kWh/ton
- (D) 25.4 kWh/ton

Answer: Option C

302. Sphericity is the ratio of the surface area of a spherical particle having the same volume as the particle to the surface area of the particle. Which of the following has the maximum value of sphericity?

- (A) Sphere
- (B) Cube
- (C) Cylinder ($L/D = 1$)
- (D) Raschig rings

Answer: Option A

303. _____ mill is not used for grinding wheat into flour and for milling of cereals & other vegetable products.

- (A) Buhrstone
- (B) Roller
- (C) Attrition
- (D) Pebble

Answer: Option D

304. Vacuum filter is most suitable for the

- (A) Removal of fines from liquid
- (B) Liquids having high vapour pressure
- (C) Liquids of very high viscosity
- (D) None of these

Answer: Option D

305. Jigging is a technique by which different particles can be

- (A) Separated by particle size
- (B) Separated by particle density
- (C) Separated by particle shape
- (D) Mixed

Answer: Option A

306. The specific cake resistance for compressible sludges is a function of the pressure drop

- (A) Over cake
- (B) Over medium
- (C) Overall
- (D) None of these

Answer: Option A

307. For grinding of cereals, grains, spices, pigments, saw dust, cork etc., the most extensively used size reduction equipment is a

- (A) Buhrstone mill
- (B) Ball mill
- (C) Crushing rolls
- (D) Hammer mill

Answer: Option A

308. In case of grinding in a ball mill

- (A) Wet grinding achieves a finer product size than dry grinding
- (B) Its capacity decreases with increasing fineness of the products
- (C) Grinding cost and power requirement increases with increasing fineness of the products
- (D) All (A), (B) and (C)

Answer: Option D

309. _____ is the most commonly used 'filter aid'.

- (A) Diatomaceous earth
- (B) Fuller's earth
- (C) Vermiculite
- (D) Semi-plastic clay

Answer: Option A

310. A tube mill as compared to a ball mill

- (A) Employs smaller balls
- (B) Gives finer size reduction but consumes more power
- (C) Has larger length/diameter ratio (>2 as compared to 1 for ball mill)
- (D) All (A), (B) and (C)

Answer: Option D

311. Which of the following is not accomplished by agitation of liquids in agitators?

- (A) Dispersing gas in liquid
- (B) Blending of immiscible liquids
- (C) Dispersing immiscible liquid in form of emulsion
- (D) Suspending solid particles

Answer: Option B

312. The unit of filter medium resistance is

- (A) cm^{-1}
- (B) gm/cm^{-1}
- (C) cm/gm^{-1}
- (D) gm^{-1}

Answer: Option A

313. Equivalent diameter of a particle is the diameter of the sphere having the same

- (A) Ratio of surface to volume as the actual volume
- (B) Ratio of volume to surface as the particle
- (C) Volume as the particle
- (D) None of these

Answer: Option A

314. Bucket elevators are not suitable for the vertical lifting of _____ materials.

- (A) Fine (e.g. - 200 mesh size coal)
- (B) Sticky (e.g. clay paste)
- (C) Small lumpy (e.g. grains and sand)
- (D) Free flowing

Answer: Option B

315. A centrifugal filtration unit operating at a rotational speed of w has inner surface of the liquid (density ρL) located at a radial distance R from the axis of rotation. The thickness of the liquid film is δ and no cake is formed. The initial pressure drop during filtration is

- (A) $\frac{1}{2}w^2 \cdot R^2 \cdot \rho L$
- (B) $\frac{1}{2}w^2 \cdot \delta^2 \cdot \rho L$
- (C) $\frac{1}{2}w^2 \cdot \delta \rho L (2R + \delta)$
- (D) $\frac{1}{2}w^2 \cdot R \cdot \rho L (R + 2\delta)$

Answer: Option C

316. A cottrell precipitator makes use of the _____ for dusty air cleaning.

- (A) Electric spark
- (B) Corona discharge
- (C) Alternating current
- (D) None of these

Answer: Option B

317. The basic filtration equation is given as $dt/dV = (\mu/A \Delta P) \cdot [(\alpha \cdot CV/A) + Rm]$, where, V is volume of the filtrate; A is the filtration area, α is specific cake resistance, μ is viscosity of the filtrate, and C is the concentration of the solids in the feed slurry.

In a 20 minutes constant rate filtration, 5 m^3 of filtrate was obtained. If this is followed by a constant pressure filtration, how much more time in minutes, it will take for another 5 m^3 of filtrate to be produced? Neglect filter medium resistance, Rm ; assume incompressible cake.

- (A) 10
- (B) 20
- (C) 25
- (D) 30

Answer: Option B

318. Which of the following relationships between co-efficient of friction (μ) between rock & roll and a (half of the angle of nip) of the particle to be crushed is correct?

- (A) $\mu > \tan \alpha$
- (B) $\mu \geq \tan \alpha$
- (C) $\mu > \tan 2\alpha$
- (D) $\mu \leq \tan \alpha$

Answer: Option B

319. Colloid mills achieve size reduction mainly by

- (A) Impact
- (B) Attrition
- (C) Cutting
- (D) Compression

Answer: Option B

320. For raschig rings, the sphericity is

- (A) 0.5
- (B) 1
- (C) < 1
- (D) $\sqrt{3}$

Answer: Option C

321. Cake resistance is

- (A) Important in the beginning of filtration
- (B) Decreased with the time of filtration
- (C) Independent of pressure drop
- (D) None of these

Answer: Option D

322. In washing type plate and frame filter press, the ratio of washing rate to the final filtrate rate is

- (A) 4
- (B) 1/4
- (C) 1
- (D) 1/2

Answer: Option B

323. A _____ mill is a revolving mill divided into two or more sections by perforated partitions in which preliminary grinding takes place at one end and the finishing grinding at the discharge end.

- (A) Compartment
- (B) Tube
- (C) Rod
- (D) Pebble

Answer: Option A

324. Pine oil and Cresylic acid are used as _____ in the froth floatation process.

- (A) Frother
- (B) Collector
- (C) Depressor
- (D) Conditioner

Answer: Option A

325. For the preliminary breaking of hard rock, we use a

- (A) Gyratory crusher
- (B) Ball mill
- (C) Tube mill
- (D) Squirrel-cage disintegrator

Answer: Option A

326. Energy requirement (per unit mass of material crushed/ground) is highest for

- (A) Jaw crusher
- (B) Rod mill
- (C) Ball mill
- (D) Fluid energy mill

Answer: Option D

327. Pick out the wrong statement.

- (A) Close circuit grinding is more economical than open circuit grinding
- (B) Cod oil, beef tallow or aluminium stearates are used as grinding aids in cement 'industries'
- (C) The equipment used for the removal of traces of solids from a liquid is called a classifier
- (D) Size enlargement is a mechanical operation exemplified by medicinal tablet making

Answer: Option C

328. Gold ore concentration is mostly done using

- (A) Jigging
- (B) Tabling
- (C) Froth floatation
- (D) Elutriation

Answer: Option B

329. For spheres, the specific surface shape factor is given by

- (A) AD/V
- (B) D/V
- (C) A/V
- (D) $\sqrt{(AD/V)}$

Answer: Option A

330. Screw conveyors are

- (A) Run at very high rpm
- (B) Suitable for sticky materials
- (C) Suitable for highly abrasive materials
- (D) All (A), (B) and (C)

Answer: Option B

331. Size reduction of the _____ can be suitably done by ball mills, crushing rolls and rod mills.

- (A) Metalliferous ores
- (B) Non-metallic ores
- (C) Basic slags
- (D) Asbestos & mica

Answer: Option A

332. A suspension of glass beads in ethylene glycol has a hindered settling velocity of 1.7 mm/s, while the terminal settling velocity of a single glass bead in ethylene glycol is 17 mm/s. If the Richardson-Zaki hindered settling index is 4.5, the volume fraction of solids in the suspension is

- (A) 0.1
- (B) 0.4
- (C) 0.6
- (D) None of these

Answer: Option C

333. Handling of ashes and similar materials can be done best by a _____ conveyor.

- (A) Flight
- (B) Drag or slat
- (C) Belt
- (D) Ribbon

Answer: Option B

334. Power consumption during turbulent flow in agitation tank is proportional to the _____ of the liquid.

- (A) Viscosity
- (B) Thermal conductivity
- (C) Surface tension
- (D) Density

Answer: Option D

335. Which of the following crushers can be considered as a combination of a jaw crusher and a roller crusher?

- (A) Rod mill
- (B) Fluid energy mill
- (C) Gyratory crusher
- (D) Ball mill

Answer: Option C

336. 200 mesh screen means 200 openings per

- (A) cm^2

- (B) cm
 - (C) inch
 - (D) inch²
- Answer: Option C

337. Which of the following terminology is not used for size reduction of materials to fine sizes or powders?

- (A) Comminution
 - (B) Dispersion
 - (C) Pulverisation
 - (D) Compression
- Answer: Option D

338. A 30% (by volume) suspension of spherical sand particles in a viscous oil has a hindered settling velocity of 4.44 $\mu\text{m/s}$. If the Richardson Zaki hindered settling index is 4.5, then the terminal velocity of a sand grain is

- (A) 0.90 $\mu\text{m/s}$
 - (B) 1 $\mu\text{m/s}$
 - (C) 22.1 $\mu\text{m/s}$
 - (D) 0.02 $\mu\text{m/s}$
- Answer: Option B

339. The porosity of a compressible cake is

- (A) Minimum at the filter medium
 - (B) Minimum at the upstream face
 - (C) Maximum at the filter medium
 - (D) Same throughout the thickness of cake
- Answer: Option A

340. If d_p is the equivalent diameter of a non-spherical particle, V_p its volume and s_p its surface area, then its sphericity is ϕ_s is defined by

- (A) $\phi_s = 6 V_p/d_p s_p$
 - (B) $\phi_s = V_p/d_p s_p$
 - (C) $\phi_s = 6 d_p s_p/V_p$
 - (D) $\phi_s = d_p s_p/V_p$
- Answer: Option A

341. The most common filter aid is

- (A) Diatomaceous earth
 - (B) Calcium silicate
 - (C) Sodium carbonate
 - (D) Silica gel
- Answer: Option A

342. Compressibility co-efficient for an absolutely compressible cake is

- (A) 0
 - (B) 1
 - (C) 0 to 1
 - (D) ∞
- Answer: Option B

343. _____ mill is normally used for grinding of talc.

- (A) Tube
 - (B) Compartment
 - (C) Ring-roll
 - (D) Pebble
- Answer: Option C

344. Which of the following is not an ultrafine grinder (colloid mill)?

- (A) Micronizers
 - (B) Agitated mills and fluid energy mills
 - (C) Toothed roll crusher
 - (D) Hammer mills with internal classification
- Answer: Option C

345. For achieving maximum capacity of the ball mill, the ball charge should be equal to about _____ percent of the ball mill volume.

- (A) 10
- (B) 25
- (C) 50
- (D) 75

Answer: Option C

346. The grinding in a hammer crusher takes place due to the

- (A) Attrition
- (B) Impact
- (C) Both (A) & (B)
- (D) Neither (A) nor (B)

Answer: Option C

347. Which of the following can be most effectively used for clarification of lube oil and printing ink?

- (A) Sparkler filter
- (B) Pre-coat filter
- (C) Disc-bowl centrifuge
- (D) Sharpies super-centrifuge

Answer: Option D

348. The capacity of a belt conveyer depends upon two factors. If one is the cross-section of the load, the other is the _____ of the belt.

- (A) Speed
- (B) Thickness
- (C) Length
- (D) None of these

Answer: Option A

349. Half the angle of nip, (α), for a roll crusher is given by (where, dr , dp and df are diameters of crushing rolls, feed particles and rolls gap respectively).

- (A) $\cos \alpha = (dr + dp)/(dr + df)$
- (B) $\cos \alpha = (dr + df)/(dr + dp)$
- (C) $\tan \alpha = (dr + dp)/(dr + df)$
- (D) $\sin \alpha = (dr + dp)/(dr + df)$

Answer: Option A

350. Size reduction does not occur due to compression in case of

- (A) Rod mills
- (B) Gyratory crushers
- (C) Jaw crushers
- (D) Smooth roll crushers

Answer: Option A

351. Mixer used for rubber compounding is

- (A) mixer-extruder
- (B) Banbury internal mixer
- (C) Muller mixer
- (D) Pug mill

Answer: Option B

352. Mass flow of granular solid (M) through a circular opening of dia, D follows

- (A) $M \propto \sqrt{D}$
- (B) $M \propto D^2$
- (C) $M \propto D^3$
- (D) $M \propto D$

Answer: Option C

353. Froth floatation is the most suitable for treating

- (A) Iron ores
- (B) Sulphide ores
- (C) Quartzite
- (D) None of these

Answer: Option B

354. A pebble mill

- (A) Is a ball mill
- (B) Employs flints or ceramic pebbles as the grinding medium
- (C) Is a tube mill lined with ceramic or other non-metallic liner
- (D) Both (B) and (C)

Answer: Option D

355. Which of the following must be stored in silos and not in open yard?

- (A) Coke breeze
- (B) High V.M. bituminous coal
- (C) Sand
- (D) None of these

Answer: Option B

356. In a mixer, the quantity, $(v \cdot L/D)$ is termed as _____ number (where, v = longitudinal velocity of material, L = length of the mixer, D = diffusivity in axial mixing).

- (A) Weber
- (B) Peclet
- (C) Brinkman
- (D) Schmidt

Answer: Option B

357. Sulphuric acid mist is arrested by using a _____ scrubber.

- (A) Packed wet
- (B) Hollow wet
- (C) Venturi
- (D) Co-current

Answer: Option C

358. In a roll crusher, both the rolls

- (A) Have the same diameter
- (B) Are rotated towards each other
- (C) Run either at the same or different speeds
- (D) All (A), (B) and (C)

Answer: Option D

359. Addition of filter aid to the slurry before filtration is done to _____ of the cake.

- (A) Increase the porosity
- (B) Increase the compressibility co-efficient
- (C) Decrease the porosity
- (D) Decrease the compressibility co-efficient

Answer: Option A

360. In froth floatation, chemical agent added to cause air adherence is called

- (A) Collector
- (B) Frother
- (C) Modifier
- (D) Activator

Answer: Option A

361. Capacity of flight conveyor in tons/hr is given by (where, W & D = width and depth of flight respectively in metre V = speed of the conveyor, metre/second ρ = bulk density of material, kg/m^3)

- (A) $3.6 W \cdot D \cdot V \cdot \rho$
- (B) $3.6 W \cdot D \cdot V$
- (C) $3.6 W \cdot V \cdot \rho$
- (D) $3.6 D \cdot V \cdot \rho$

Answer: Option A

362. Balls for ball mills are never made of

- (A) Forged/cast steel
- (B) Lead
- (C) Cast iron

(D) Alloy steel
Answer: Option B

363. For removal of very small amounts of precipitate from large volume of water, the most suitable filter is the _____ filter.

- (A) Plate & frame
 - (B) Shell & leaf
 - (C) Sand
 - (D) Rotary vacuum
- Answer: Option C

364. Helical screw agitator is used for

- (A) Mixing highly viscous pastes
 - (B) Blending immiscible liquids
 - (C) Mixing liquids at very high temperature ($> 250\text{ }^{\circ}\text{C}$)
 - (D) None of these
- Answer: Option A

365. Which of the following conveyors cannot be recommended for transportation of abrasive materials?

- (A) Belt conveyor
 - (B) Apron conveyor
 - (C) Flight conveyor
 - (D) Chain conveyor
- Answer: Option C

366. Power required to drive a ball mill with a particular ball load is proportional to (where, D = diameter of ball mill.)

- (A) D
 - (B) $1/D$
 - (C) $D^{2.5}$
 - (D) $1/D^{2.5}$
- Answer: Option C

367. Mesh indicates the number of holes per

- (A) Square inch
 - (B) Linear inch
 - (C) Square foot
 - (D) Linear foot
- Answer: Option B

368. Which of the following is not a non-metalliferous mineral?

- (A) Calcite
 - (B) Fluorspar
 - (C) Quartz
 - (D) Cassiterite
- Answer: Option D

369. Which of the following comes in the category of primary crusher for hard and tough stone?

- (A) Jaw crusher
 - (B) Cone crusher
 - (C) Gyratory crusher
 - (D) None of these
- Answer: Option A

370. Fluid medium used in the classification technique of mineral beneficiation is

- (A) Air
 - (B) Water
 - (C) Either (A) or (B)
 - (D) Neither (A) nor (B)
- Answer: Option C

371. Two particles are called to be equal settling, if they are having the same.

- (A) Size
- (B) Specific gravity

- (C) Terminal velocities in the same fluid & in the same field of force
(D) None of these
Answer: Option C

372. A widely used size reduction equipment for _____ is Bradford breaker.

- (A) Talc
(B) Coal
(C) Iron core
(D) Wheat

Answer: Option B

373. Apron conveyors are used for

- (A) Heavy loads & short runs
(B) Small loads & long runs
(C) Heavy loads & long runs
(D) None of these

Answer: Option A

374. The equivalent diameter of channel of a constant non-circular cross-section of 3 cm by 6 cm will be _____ cms.

- (A) 20
(B) 12
(C) 8
(D) 2

Answer: Option D

375. For a non-spherical particle, the sphericity

- (A) Is defined as the ratio of surface area of a sphere having the same volume as the particle to the actual surface area of the particle
(B) Has the dimension of length
(C) Is always less than 1
(D) Is the ratio of volume of a sphere having the same surface area as the particle to the actual volume of the particle

Answer: Option A

376. Mixing of light fine powder such as insecticides is done by

- (A) Banbury mixer
(B) Pug mill
(C) Impact wheels
(D) Kneader

Answer: Option C

377. Velocity of a small particle of diameter ' D_p ' at a distance ' r ' from the rotational axis of a cyclone rotating at an angular speed ' ω ' is given by (the other symbols are as per standard notation).

- (A) $[(D_p/18) \cdot (\rho_s - \rho/\mu)] \omega^2 r$
(B) $[(D_p^2/18) \cdot (\rho_s - \rho/\mu)] \omega^2 r$
(C) $[(D_p/18) \cdot (\rho_s - \rho/\mu)] \omega^2 r^2$
(D) $[(D_p^2/18) \cdot (\rho_s - \rho/\mu)] \omega^2 r$

Answer: Option D

378. Energy consumption in a crusher decreases with increase in the

- (A) Size of the product (at constant feed size)
(B) Capacity of the crushing machine
(C) Size of feed (at constant reduction ratio)
(D) All (A), (B) & (C)

Answer: Option D

379. Which of the following is the most suitable for cleaning of fine coal dust (<0.5 mm)?

- (A) Trough washer
(B) Baum jig washer
(C) Spiral separator
(D) Froth floatation

Answer: Option D

380. Pick out the wrong statement.

- (A) Gape is the greatest distance between the crushing surfaces or the jaws
- (B) The angle of nip (2α) is the angle between roll faces at the level where they will just take hold of a particle and draw it in the crushing zone
- (C) Crushing efficiency is the ratio of the energy absorbed by the solid to the surfaces energy created by crushing
- (D) Reduction ratio is the ratio of the maximum size of the particles in the feed to that in the product

Answer: Option C

381. The ratio of the area of openings in one screen (Taylor series) to that of the openings in the next smaller screen is

- (A) 1.5
- (B) 1
- (C) $\sqrt{2}$
- (D) None of these

Answer: Option D

382. Filter medium resistance is that offered by the

- (A) Filter cloth
- (B) Embedded particles in the septum
- (C) Filter cloth and the embedded particle collectively
- (D) None of these

Answer: Option C

383. Which of the following is not a cutting machine?

- (A) Dicers
- (B) Knife cutters
- (C) Slitters
- (D) Tube mills

Answer: Option D

384. Crushing of mineral particles is accomplished in a 'cage mill', when one or more alloy steel bars are revolved in opposite directions. It is a type of _____ mill.

- (A) Impact
- (B) Roll
- (C) Vibratory
- (D) None of these

Answer: Option A

385. The sphericity of a cylinder of 1 mm diameter and length 3 mm is

- (A) 0.9
- (B) 0.78
- (C) 0.6
- (D) 0.5

Answer: Option A

386. A compressible cake has the

- (A) Maximum porosity at the upstream side
- (B) Maximum porosity at the filter medium
- (C) Same porosity throughout the cake thickness
- (D) None of these

Answer: Option A

387. Separation of materials into products based on the difference of their sizes is called

- (A) Sizing
- (B) Sorting
- (C) Classification
- (D) Flocculation

Answer: Option A

388. Pick out the wrong statement.

- (A) Recycled coarse material to the grinder by a classifier is termed as circulating load
- (B) Wear and tear in wet crushing is more than that in dry crushing of materials
- (C) Size enlargement (opposite of size reduction) is not a mechanical operation

(D) A 'dust catcher' is simply an enlargement in a pipeline which permits the solids to settle down due to reduction in velocity of the dust laden gas

Answer: Option C

389. Ultra centrifuges are used for the separation of _____ solid particles.

- (A) Coarse
- (B) Fine
- (C) Colloidal
- (D) Dissolved

Answer: Option C

390. Filter medium resistance is important during the _____ of filtration.

- (A) Early stages
- (B) Final stages
- (C) Entire process
- (D) None of these

Answer: Option A

391. Sizing of very fine particles of the order of 5 to 10 microns is done by elutriation, which is a _____ operation.

- (A) Clarification
- (B) Sedimentation
- (C) Flocculation
- (D) Classification

Answer: Option D

392. Diatomaceous earth is a/an

- (A) Explosive
- (B) Filter aid
- (C) Filter medium
- (D) Catalyst

Answer: Option B

393. Run of mine (ROM) coal is crushed by a _____ for use in domestic ovens.

- (A) Jaw crusher
- (B) Hammer crusher
- (C) Ball mill
- (D) Tube mill

Answer: Option B

394. Sedimentation on commercial scale occurs in

- (A) Classifiers
- (B) Thickeners
- (C) Rotary drum filters
- (D) Cyclones

Answer: Option C

395. A sand mixture was screened through a standard 10-mesh screen. The mass fraction of the oversize material in feed, overflow and underflow were found to be 0.38, 0.79 and 0.22 respectively. The screen effectiveness based on the oversize is

- (A) 0.50
- (B) 0.58
- (C) 0.68
- (D) 0.62

Answer: Option A

396. Filter aid is used to

- (A) Increase the rate of filtration
- (B) Decrease the pressure drop
- (C) Increase the porosity of the cake
- (D) Act as a support base for the septum

Answer: Option C

397. _____ conveyor is the most suitable for long distance transportation of cold, non-abrasive granular/irregular shape/fine materials.

- (A) Bucket
- (B) Belt
- (C) Screw
- (D) Apron

Answer: Option B

398. In a roll crusher, the specific power consumption and the production rate is affected by the

- (A) Reduction ratio
- (B) Differential roll speed
- (C) Both (A) and (B)
- (D) Neither (A) nor (B)

Answer: Option C

399. _____ mills fall in the category of tumbling mills,

- (A) Ball and pebble
- (B) Rod and tube
- (C) Compartment
- (D) All (A), (B) & (C)

Answer: Option D

400. The value of 'angle of nip' is generally about

- (A) 16°
- (B) 32°
- (C) 52°
- (D) 64°

Answer: Option B

401. Pulverised coal passing through 200 mesh screen has a diameter of 0.074 mm (74 micron). The same passing through 50 mesh screen will have a dia of _____ mm.

- (A) 0.007
- (B) 0.30
- (C) 50
- (D) 0.014

Answer: Option B

402. For Indian standard (IS) screens, the mesh number is equal to its aperture size expressed to the nearest deca-micron (0.01 mm). Aperture width of IS screen of mesh number 50 will be approximately _____ microns.

- (A) 5
- (B) 50
- (C) 500
- (D) 5000

Answer: Option C

403. For classification of potable (drinking) water, we use a _____ filter.

- (A) Gravity sand
- (B) Plate and frame
- (C) Vacuum leaf
- (D) Rotary vacuum

Answer: Option A

404. Which of the following is not categorised as a "mechanical operation"?

- (A) Agitation
- (B) Filtration
- (C) Size enlargement
- (D) Humidification

Answer: Option D

405. Trommels employ _____ for screening of materials.

- (A) Fibrous cloth
- (B) Woven wire screen
- (C) Punched plate
- (D) None of these

Answer: Option C

406. Grinding characteristic of a material is given by its

- (A) HGI
- (B) Angle of repose
- (C) Shatter index
- (D) Abrasion index

Answer: Option A

407. The material is crushed in a gyratory crusher by the action of

- (A) Impact
- (B) Compression
- (C) Attrition
- (D) Cutting

Answer: Option B

408. Ball mills and tube mills with flint or porcelain balls are used for size reduction of

- (A) Asbestos
- (B) Rubber
- (C) Non-metallic ores
- (D) Limestone

Answer: Option C

409. Production rate _____ with increased fineness, with a given energy input to the size reduction machine.

- (A) Decreases
- (B) Increases
- (C) Remains unchanged
- (D) May increase or decrease; depends on the machine

Answer: Option A

410. With increase in drum speed, in a rotary drum filter, the filtration rate

- (A) Increases
- (B) Increases linearly
- (C) Decreases
- (D) Is not affected

Answer: Option A

411. Cartridge filters are termed as 'edge' filters, because of the fact that the

- (A) Disks have very sharp edge
- (B) Solids are not deposited at the edge of the disk
- (C) Bulk of the solids are removed at the periphery of the disks
- (D) None of these

Answer: Option C

412. Gravity settling process is not involved in the working of a

- (A) Hydrocyclone
- (B) Classifier
- (C) Dorr-thickener
- (D) Sedimentation tank

Answer: Option A

413. Moisture can be removed from lubricating oil using

- (A) Tubular centrifuge
- (B) Clarifier
- (C) Sparkler filter
- (D) Vacuum leaf filter

Answer: Option A

414. Mixing of plastic solids is generally facilitated by

- (A) Dispersion
- (B) Mastication
- (C) Kneading
- (D) None of these

Answer: Option C

415. Hot, lumpy & abrasive materials are best transported by using a/an _____ conveyor.

- (A) Apron
 - (B) Belt
 - (C) Screw
 - (D) Flight
- Answer: Option A

416. The main size reduction operation in ultrafine grinders is

- (A) Cutting
 - (B) Attrition
 - (C) Compression
 - (D) Impact
- Answer: Option B

417. What is the selectivity index, if the grade of tailings & concentrate is the same?

- (A) 0
 - (B) ∞
 - (C) 1
 - (D) 0.5
- Answer: Option C

418. Which of the following is not used as a filter medium in case of corrosive liquids?

- (A) Nylon
 - (B) Glass cloth
 - (C) Metal cloth of monel or stainless steel
 - (D) Cotton fabric
- Answer: Option D

419. Fick's law relates to

- (A) Energy consumption
 - (B) Final particle size
 - (C) Feed size
 - (D) None of these
- Answer: Option A

420. Which of the following is a pressure filter?

- (A) Leaf filter (Moore filter)
 - (B) Plate and flame filter
 - (C) Rotary drum filter
 - (D) Sand filter
- Answer: Option B

421. The constants (K_b , K_r and K_k) used in the laws of crushing (i.e., Bond's law, Rittinger's law and Kick's law) depend upon the

- (A) Feed material
 - (B) Type of crushing machine
 - (C) Both (A) & (B)
 - (D) Neither (A) nor (B)
- Answer: Option C

422. 200 mesh sieve size corresponds to _____ microns.

- (A) 24
 - (B) 74
 - (C) 154
 - (D) 200
- Answer: Option B

423. _____ mean diameter of particles is given by $\Sigma (x_i/D_{pi}^{-3})$

- (A) Mass
 - (B) Volume
 - (C) Arithmetic
 - (D) Volume surface
- Answer: Option B

424. Which of the following mineral dressing operations is termed as 'comminution'?

- (A) Panning

- (B) Spiralling
 - (C) Tabling
 - (D) None of these
- Answer: Option D

425. Horsepower required for a roll crusher is directly proportional to its

- (A) Reduction ratio
 - (B) Capacity
 - (C) Both (A) & (B)
 - (D) Neither (A) nor (B)
- Answer: Option C

426. Which of the following is not an industrial screening equipment?

- (A) Sharpies centrifuge
 - (B) Vibrating screen
 - (C) Grizzly
 - (D) Trommel
- Answer: Option A

427. Weber number is significant and is concerned with the

- (A) Solid-liquid mixing
 - (B) Liquid-liquid mixing
 - (C) Dispersion of liquid in liquid
 - (D) Suspension of solid in liquid
- Answer: Option C

428. Highly viscous liquids & pastes are agitated by

- (A) Propellers
 - (B) Turbine agitators
 - (C) Multiple blade paddles
 - (D) None of these
- Answer: Option C

429. The unit of specific cake resistance is

- (A) gm/cm^2
 - (B) cm/gm
 - (C) cm/gm^2
 - (D) gm/gm
- Answer: Option A

430. Supporting legs of a plate and frame filter is normally made of

- (A) Stainless steel
 - (B) Cast iron
 - (C) High speed steel
 - (D) Wooden plank
- Answer: Option B

431. Colloidal mills are used for _____ grinding.

- (A) Coarse
 - (B) Intermediate
 - (C) Fine
 - (D) Ultrafine
- Answer: Option D

432. Tabular bowl centrifuges as compared to disk bowl centrifuges

- (A) Operate at higher speed
 - (B) Employ bowl of larger diameter
 - (C) Can't be operated under pressure/vacuum
 - (D) Can't be used for separation of fine suspended solids from a liquid
- Answer: Option A

433. Which of the following represents the plot of filtrate volume versus time for constant pressure filtration?

- (A) Parabola
- (B) Straight line

- (C) Hyperbola
 - (D) Exponential curve
- Answer: Option A

434. What is the usual value of angle of nip for crushing of ordinary rock in smooth steel crushing rolls?

- (A) 16°
- (B) 32°
- (C) 40°
- (D) 46°

Answer: Option B

435. In the cyclone separator used for separation of dust from dust laden gas, the gas

- (A) Enters the cyclone from the top
- (B) Is admitted tangentially at high velocity
- (C) Develops a helical motion inside the chamber
- (D) Both (B) and (C)

Answer: Option D

436. Size reduction of _____ is accomplished in steam heated rollers and roll crushers.

- (A) Resins
- (B) Gums
- (C) Hard rubber
- (D) Waxes

Answer: Option C

437. The study on washability of coal is done by using the _____ technique.

- (A) Tabling
- (B) Elutriation
- (C) Heavy media separation
- (D) None of these

Answer: Option C

438. If radius of a batch basket centrifuge is halved & the r.p.m. is doubled, then the

- (A) Linear speed of the basket is doubled
- (B) Linear speed of the basket is halved
- (C) Centrifugal force is doubled
- (D) Capacity of centrifuge is increased

Answer: Option C

439. _____ is used for producing a thick suspension from a thin slurry.

- (A) Cartridge filter
- (B) Rotary drum vacuum filter
- (C) Pressure filter thickener
- (D) Plate and frame filter press

Answer: Option C

440. Range of compressibility co-efficient of the commercial compressible cake obtained in filtration operation is

- (A) 0.01 to 0.1
- (B) 0.1 to 0.3
- (C) 0.2 to 0.8
- (D) 0.2 to 0.4

Answer: Option C

441. The speed of a rotary drum vacuum filter may be about _____ rpm.

- (A) 1
- (B) 50
- (C) 100
- (D) 500

Answer: Option A

442. _____ Centrifuge is normally used in sugar mills.

- (A) Tubular bowl
- (B) Disc-bowl

- (C) Suspended batch basket
 - (D) Perforated horizontal basket continuous
- Answer: Option C

443. Vibrating screens have capacity in the range of _____ tons/ft² .mm mesh size.

- (A) 0.2 to 0.8
- (B) 5 to 25
- (C) 50 to 100
- (D) 100 to 250

Answer: Option A

444. Pick out the wrong statement pertaining to the roll crushers.

- (A) Maximum feed size determines the required roll diameter
- (B) For hard material's crushing, the reduction ratio should not exceed 4
- (C) Both the rolls run necessarily at the same speed
- (D) Reduction ratio and differential roll speed affect production rate & energy consumed per unit of surface produced

Answer: Option C

445. _____ mills are termed as disintegrators.

- (A) Cage
- (B) Compartment
- (C) Pebble
- (D) All tumbling

Answer: Option A

446. Vertical transportation of materials can be done by a/an

- (A) Apron conveyor
- (B) Pneumatic conveyor
- (C) Bucket elevator
- (D) Both (B) & (C)

Answer: Option D

447. The term 'angle of nip' is concerned with the operation of the _____ crushers.

- (A) Jaw
- (B) Roll
- (C) Gyratory
- (D) None of these

Answer: Option B

448. The capacity of a pneumatic conveying system depends upon the

- (A) Bulk density of materials
- (B) Pressure of the conveying air
- (C) Diameter of the conveying line
- (D) All (A), (B) and (C)

Answer: Option D

449. Which of the following gives the work required for size reduction of coal to -200 mesh in a ball mill most accurately?

- (A) Rittinger's law
- (B) Kick's law
- (C) Bond's law
- (D) None of these

Answer: Option A

450. Which of the following parts of a jaw crusher is subjected to maximum wear and tear during its operation?

- (A) Check plates
- (B) Jaw plates
- (C) Toggles
- (D) Crush shaft

Answer: Option B