Immiscible liquids of different

Miscible liquids of different

Immiscible liquids of same

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
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 A

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, \( \mu = \) 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?

<table>
<thead>
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<th>Parameters</th>
<th>Unit</th>
<th>Maximum</th>
<th>Minimum</th>
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<td>Feed size</td>
<td>mm</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Product size</td>
<td>mm</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

(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) \( \frac{1}{d} \)
   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) Gyratory crusher is a coarse crusher
   Answer: Option B

31. Sphericity of rashig 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) Taggarts 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
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:
   \[ P_o = \frac{\rho}{\rho N^3 D^5} \]
   \[ Re = \frac{\rho N D^2}{\mu} \]  
   \( N \) 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) \( N \propto 1/D \)
   (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
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, cm \( S \) = 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
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 crushe and Blake jaw crushe 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
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 = $9.81 \text{ m/sec}^2$ and, $r =$ radius of trammel, metre.)
   (A) $(1/2\pi) \sqrt{g/r}$
   (B) $(1/\pi) \sqrt{g/r}$
   (C) $\frac{1}{2} \sqrt{g/r}$
   (D) $2\pi \sqrt{g/r}$
   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) $N_c = (1/4\pi) \sqrt{g/(R_1 - R_2)}$
   (B) $N_c = (1/2\pi) \sqrt{g/(R_1 - R_2)}$
   (C) $N_c = (1/\pi) \sqrt{g/(R_1 - R_2)}$
   (D) $N_c = (1/2\pi) \sqrt{(R_1 - R_2)/g}$
   Answer: Option B

92. General crushing equation is given by $d(P/m) = -K (d\bar{D}_s/\bar{D}_s^n)$. 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 \( \rho = \) density of material to be crushed, kg/m\(^3\) 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.
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) \(\pi = \frac{A}{D^2}\)
(B) \(\frac{\pi}{6} = \frac{V}{D^3}\)
(C) \(\frac{AD}{V}\)
(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
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) √2
   (D) √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) $P \cdot \rho \cdot n^3 \cdot D^2 \cdot \mu^2$
   (B) $P \cdot \rho \cdot n \cdot \mu^2$
   (C) $n^3 \cdot D^3 \cdot \rho \cdot P \cdot g_c$
   (D) $P \cdot g_c \cdot n \cdot D^2 \cdot \mu^2 \cdot \rho$
   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, \( D_s \) & \( D_b \) = volume surface mean diameter of feed
& product respectively.)
   (A) \( P/m = K/\sqrt{D_p} \)
   (B) \( P/m = K . \ln D_s/D_b \)
   (C) \( P/m = K . (1/D_b - 1/D_s) \)
   (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
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 C

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°
   (B) N¹
   (C) N²
   (D) N³
   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 flotation 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
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) √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
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 $\rho$ 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°
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, \( P/m = K \cdot \ln \left( \frac{D_o}{D_{sb}} \right) \)
(C) Communition 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) \( (S/V)_f^2 \)
(D) \( (S/V)_f \)
Answer: Option B

252. Which of the following is not a wet classifier?
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, \( \rho \) = 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 \( m_i \) (\( i = 1, 2, 3, \ldots, \infty \)) is given by
   (A) \( \sum_{i=1}^{j} N_i \frac{d_i^3}{\sum_{i=1}^{\infty} N_i d_i^3} \)
   (B) \( \frac{\sum_{i=1}^{j} m_i d_i^3}{\sum_{i=1}^{\infty} N_i m_i d_i^3} \)
   (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
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) $D_b^2 = K.D_f^2$
   (B) $D_b = K.D_f$
   (C) $D_b^3 = K.D_f^3$
   (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 discoulouration 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 \( \mu \) = 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, \( \rho \) = density of solids in kg/m\(^3\))
   (A) 3.6 AVS.\( \rho \)
   (B) 3.6 A.V.\( \rho \)
   (C) 3.6 A.S. \( \rho \)
   (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) \( \pi \)
   (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
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)
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 $\rho_L$) located at a radial distance $R$ from the axis of rotation. The thickness of the liquid film is $\delta$ 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 $\frac{dt}{dV} = (\mu/A \Delta P). [(\alpha.CV/A) + Rm]$, where, $V$ is volume of the filtrate; $A$ is the filtration area, $\alpha$ is specific cake resistance, $\mu$ 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 ($\mu$) 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) √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
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) cm²
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 μm/s. If the Richardson Zaki hindered settling index is 4.5, then the terminal velocity of a sand grain is
   (A) 0.90 μm/s
   (B) 1 μm/s
   (C) 22.1 μm/s
   (D) 0.02 μm/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 \( dp \) is the equivalent diameter of a non-spherical particle, \( V_p \) its volume and \( sp \) its surface area, then its sphericity is \( \phi_s \) is defined by
   (A) \( \phi_s = 6 \frac{V_p}{dp sp} \)
   (B) \( \phi_s = V_p/dp sp \)
   (C) \( \phi_s = 6 \frac{dp sp}{V_p} \)
   (D) \( \phi_s = dp sp/V_p \)
   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) \( \infty \)
   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 conveyor 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 roll gap respectively).

(A) \(\cos \alpha = \frac{(dr + dp)}{(dr + df)}\)
(B) \(\cos \alpha = \frac{(dr + df)}{(dr + dp)}\)
(C) \(\tan \alpha = \frac{(dr + dp)}{(dr + df)}\)
(D) \(\sin \alpha = \frac{(dr + dp)}{(dr + df)}\)
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 flotation is the most suitable for treating

(A) Iron ores
(B) Sulphide ores
(C) Quartzite
(D) None of these
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, \(v L/D\) 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 conveyer, metre/second \(\rho\) = bulk density of material, \(kg/m^3\))
   (A) 3.6 \(W.D.V.\rho\)
   (B) 3.6 \(W.D.V\)
   (C) 3.6 \(W.V.\rho\)
   (D) 3.6 \(D.V.\rho\)
   Answer: Option A

362. Balls for ball mills are never made of
   (A) Forged/cast steel
   (B) Lead
   (C) Cast iron
   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 °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
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 'Dp' 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) \[ \left( \frac{Dp}{18} \right) (\rho_s - \rho/\mu) \omega^2 r \]
   (B) \[ \left( \frac{Dp^2}{18} \right) (\rho_s - \rho/\mu) \omega^2 r \]
   (C) \[ \left( \frac{Dp}{18} \right) (\rho_s - \rho/\mu) \omega^2 r^2 \]
   (D) \[ \left( \frac{Dp^2}{18} \right) (\rho_s - \rho/\mu) \omega^2 r \]
   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) √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.
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.
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 (Kb, Kr and Kk) 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 Σ (x_i/D_{pi}^-)
   (A) Mass
   (B) Volume
   (C) Arithmetic
   (D) Volume surface
   Answer: Option B

424. Which of the following mineral dressing operations is termed as ‘communion’?
   (A) Panning
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/cm²
   (B) cm/gm
   (C) cm/gm²
   (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
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
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) Gyraory
   (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