Uka Tarsadia University(Diwaliba Polytechnic)
Diploma in Chemical Engineering
Objective Type Questions (Fluid Flow Operations)

UNIT 1 PROPERTIES OF FLUID

1. The specific weight of the fluid depends upon
   a. gravitational acceleration
   b. mass density of the fluid
   c. both above
   d. none of the above
2. Which one of the following is the unit of mass density?
   a. kg = m^3
   b. kg = m^2
   c. kg = m
   d. kg = ms
3. Which property of the fluid offers resistance to deformation under the action of shear force?
   a. Density
   b. viscosity
   c. permeability
   d. specific gravity
4. Shear stress in static fluid is
   a. always zero
   b. always maximum
   c. between zero to maximum
   d. unpredictable
5. The specific volume of a liquid is the reciprocal of
   a. weight density
   b. mass density
   c. specific weight
   d. specific volume

a. Which one of the following is the unit of specific weight?
   a. N = m^3
   b. N = m^2
   c. N = m
   d. N = ms
6. Inter molecular cohesive force in the fluids is
   a. less than that of the solids
   b. more than that of the solids
   c. equal to that of the solids
   d. unpredictable
7. The physical quantity Wok done S.I. unit----------
   a. J
   b. N
   c. M
   d. Sec
8. the physical quantity power S.I. unit----------

a. J/sec
b. J
c. N
d. Kg

9. Newton's law of viscosity states that
   a. the shear stress applied to the fluid is directly proportional to the velocity gradient (du/dy)
   b. the shear stress applied to the fluid is inversely proportional to the velocity gradient (du/dy)
   c. the shear stress applied to the fluid is directly proportional to the specific weight of the fluid
   d. the shear stress applied to the fluid is inversely proportional to the specific weight of the fluid
10. Which branch of fluid mechanics deals with translation, rotation and deformation of the fluid element without considering the force and energy causing such motion is called as
    a. fluid dynamics
    b. fluid kinematics
    c. fluid kinetics
    d. Hydraulic

11. _____ fluid is incompressible and have zero viscosity.
    a. Real
    b. Ideal
    c. Pseudoplatic
    d. Dilatant
12. In _____ fluid shear stress increases with velocity gradient.
    a. Bingham plastic
    b. Dilatent
    c. Pseudoplatic
    d. Newtonian
13. _____fluid is compressible & have some viscosity.
    a. Ideal
    b. Real
    c. Imaginary
    d. Dilatent
14. _____fluid is a real fluid in which shear stress is directly proportional to velocity gradient.
    a. Dilatent
    b. Newtonian
    c. Bingham
    d. None
15. In _____fluid, shear stress is more than the yield value & is proportional to shear strain.
    a. Bingham
    b. Dilatent
    c. Pseudoplatic
    d. Newtonian
16. Which of the following is shear thinning fluid?
    a) Pseudoplastic
    b) Dilatant
    c) Rheopectic
    d) Bingham plastic
17. The fluid will rise in capillary when the capillary is placed in fluid, if

a. the adhesion force between molecules of fluid and tube is less than the cohesion between liquid molecules
b. the adhesion force between molecules of fluid and tube is more than the cohesion between liquid molecules
c. the adhesion force between molecules of fluid and tube is equal to the cohesion between liquid molecules
d. Noone of the above

18. The ratio of inertia force to the viscous force of liquid is called _____
    a. Froude's no.
    b. Euler's no.
    c. Reynold's no.
    d. Mach no.
19. The ratio of square root of inertia force of flowing fluid to the _____ force is Euler's no.
    a. Surface tension
    b. Elastic
    c. Pressure
    d. Gravitational
20. Inertia force is equated as _____
    a. $\sigma\rho l$
    b. $\rho A v^2$
    c. $\rho A l$
    d. $\sigma\rho v^2$
21. The angle of contact between the water & the glass capillary tube is fixed as _____
    a. $0°$
    b. $1°$
    c. $\theta°$
    d. $180°$
22. The value of Capillary rise or fall depends on _____ of liquid, _____ of tube & _____ of liquid.
    a. Specific weight, Surface tension, Volume
    b. Specific weight, Volume, Surface tension
    c. Surface tension, Diameter, Specific weight
    d. Surface tension, Diameter, Volume
23. The rate at which the particles of fluid can spread is called_____
    a. Surface tension
    b. Diffusivity
    c. Viscosity
    d. Kinetics
24. The Prandtl Number approximates _____
    a. Momentum diffusivity to thermal diffusivity
    b. Thermal diffusivity to momentum diffusivity
    c. Shear stress to thermal diffusivity
    d. Thermal diffusivity to kinematic viscosity
25. Which among the following is the standard symbol for Froude number?
    a. F
    b. F_0
    c. F_r

d. f

26. Which among the following is the standard symbol for Peclet number?
    a. P
    b. pc
    c. P_e
    d. Pr
27. What is the value of Prandtl number for highly viscous oils?
    a. 0 - 1
    b. 1- 100
    c. 10 -100
    d. 100 - 10000
28. What is the value of Prandtl number for liquid metals?
    a. 0.03 – 0.01
    b. 1 -2
    c. 2 -3
    d. 0.1- 5
29. The product of buoyant force and inertia force to the square of the viscous force is known as
    a. Stanton number
    b. Grashof number
    c. Fourier number
    d. Peclet number
30. The ratio of heat transfer coefficient to the flow of heat per unit temperature rise due to the velocity of the fluid is known as
    a. Fourier number
    b. Grashof number
    c. Peclet number
    d. Stanton number
31. Which number indicates the relative ability of the fluid to diffuse momentum and internal energy by molecular mechanisms?
    a. Nusselt number
    b. Prandtl number
    c. Peclet number
    d. Stanton number
32. The unit of physical quantity which does not depend on the unit of any other physical quantity is called as
    a. Independent dimension
    b. Fundamental dimension
    c. Core dimension
    d. None of the aboe
33. Which of the following is not a primary quantity?
    a. Mass
    b. Temperature
    c. Time
    d. None of these
34. What are the dimensions of force?
    a. $M\ L\ T^{-2}$
    b. M L T
    c. M

d. M T

35. Which of the following quantities has the dimensions [$M^0 L^0 T^0$]
    a. Density
    b. Stress
    c. Strain
    d. Strain Rate
36. What are the dimensions of power?
    a. M L T
    b. $M L^2 T^{-3}$
    c. $M L^2 T^2$
    d. M L
37. What are the dimensions of momentum?
    a. M L T
    b. M L T
    c. $M L T^{-1}$
    d. $M L^2$
38. What are the dimensions of dynamic viscosity?
    a. $M L^{-2} T^{-3}$
    b. $M L^{-1} T^{-1}$
    c. $M L T^{-1}$
    d. None of these
39. What are the dimensions of work done?
    a. $M L^{-2} T^{-3}$
    b. $M L^{-2} T^{-2}$
    c. $M L^{-2} T$
    d. M L T
40. Which of the following is a dimensionless equation?
    a. Reynold's equation
    b. Euler's equation
    c. Weber's equation
    d. All of the above
41. Which of the following number is applicable in open hydraulic structure such as spillways, where gravitational force is predominant?
    a. Reynold's Number
    b. Euler's Number
    c. Weber's Number
    d. Froude's Number
42. Square root of the ratio of inertia force to elastic force is called as
    a. Mach's Number
    b. Cauchy's Number
    c. Both A & B
    d. None of these
43. When is a liquid said to be not in a boiling or vaporized state?
    a. If the pressure on liquid is equal to its vapour pressure
    b. If the pressure on liquid is less than its vapour pressure
    c. If the pressure on liquid is more than its vapour pressure
    d. None of these
44. Bulk modulus is the ratio of

a. shear stress to volumetric strain
b. volumetric strain to shear stress
c. compressive stress to volumetric strain
d. volumetric strain to compressive stress

45. When the angle between surface tension with the liquid (θ) is greater than 90^o, the liquid becomes
a. flat
b. concave upward
c. convex upward
d. None of the above

UNIT 2 FLUID STATICS

1. What can be measured using Manometer?
    a. Pressure
    b. Volume
    c. Flow state
    d. Density
2. _____ is used to measure the pressure at a point in a fluid by balancing the column of fluid.
    a. Mechanical gauge
    b. Pressure gauge
    c. Manometer
    d. None
3. In _____ type of manometer, one end of the tube is kept open to atmosphere in order to measure pressure.
    a. Differential manometer
    b. Piezometer
    c. U-tube
    d. Single column
4. The density of liquid _____
    a. Changes with temperature
    b. Changes with pressure
    c. Considered as constant
    d. Both a. & b.
5. _____is the ratio between weight of fluid & it's volume.
    a. Mass Density
    b. Weight Density
    c. Specific Volume
    d. Specific Mass
6. The ratio of density of substance to the density of liquid or gaseous is known as ____
    a. Specific Weight
    b. Specific Gravity
    c. Specific Density
    d. None
7. According to Pascal's Law the pressure or intensity of pressure at a point in a static fluid is _____
    a. Increased from top to bottom
    b. Decreased from top to bottom
    c. Equal in all directions
    d. Varies in different directions
8. The Hydrostatic law states that _____
    a. The rate of increase of pressure in vertical direction is equal to weight density of fluid at that point
    b. The rate of decrease of pressure in horizontal direction is equal to pressure of fluid at that point
    c. The rate of increase of pressure in horizontal direction is equal to density of fluid at that point
    d. The rate of decrease of pressure in horizontal direction is equal to weight density of fluid at that point

9. Which pressure is measured with reference to absolute vacuum pressure?
    a. Gauge pressure
    b. Normal pressure
    c. Absolute pressure
    d. Vacuum pressure
10. Vacuum pressure = _____
    a. Atmospheric pressure – Gauge pressure
    b. Atmospheric pressure + Gauge pressure
    c. Absolute pressure + Atmospheric pressure
    d. Atmospheric pressure – Absolute pressure
11. If there are n variables in physical phenomenon & if these variables contain m fundamental dimensions, the variables are arranged into $(n - m)$ dimensionless terms called _____
    a. Buckingham's term
    b. θ term
    c. π term
    d. Both a. & c.
12. The performance of Continuous Gravity Decantor can be analysed by _____
    a. Gravitational Laws
    b. Fluid Kinematics
    c. Fluid Kinetics
    d. Fluid Statics
13. In _____flow, the fluid characteristics like velocity, pressure, density, etc., at a point do not change with time.
    a. Non-steady
    b. Uniform
    c. Steady
    d. Non-uniform
14. Gauge pressure =----------
    a. Absolute pressure + Atmospheric pressure
    b. Absolute pressure - Atmospheric pressure
    c. Absolute pressure + vacuum pressure
    d. None of the above
15. Absolute pressure=----------
    a. Atmospheric pressure – Gauge pressure
    b. Atmospheric pressure + Gauge pressure
    c. Absolute pressure + vacuum pressure
    d. None of these
16. A manometric liquid should suitably have _____
    a) Low density & Low Vapour pressure
    b) Low density & High Vapour pressure
    c) High density & Low Vapour pressure
    d) High density & High Vapour pressure
17. A simple U-tube manometer can measure negative gauge pressures.
    a) True
    b) False
18. A Piezometer is used to measure the pressure of a
    (a) Gas

(b) Liquid
(c) Gas as well as liquid
(d) None

19. A differential manometer is used to measure the pressure difference between two points in a flowing
    (a) Gas
    (b) Liquid
    (c) Gas as well as liquid
    (d) None
20. A inverted tube manometer is used to measure the pressure difference between two points of a
    (a) Gas
    (b) Liquid
    (c) Gas as well as liquid
    (d) None
21. A Bourdon tube pressure gauge measures
    (a) Low pressures
    (b) High pressures
    (c) Low as well as high pressures
    (d) None
22. Bourdon tubes are generally made of
    (a) Tin
    (b) Bronze
    (c) copper
    (d) None
23. Which of the following is a mechanical gauge?
    (a) Strain gauge
    (b) Piezoelectric
    (c) Bourdon tube
    (d) None
24. Inclined single column manometer is useful for which of the pressure
    (a) Small
    (b) Medium
    (c) High
    (d) None
25. The distance moved by liquid will be more in which type of manometer?
    a) Inclined Single coloumn manometer
    b) Vertical Single coloumn manometer
    c) Horizontal Single coloumn manometer
    d) None of the mentioned
26. Differential manometer gives the pressure reading with respect to atmospheric pressure.
    a) True
    b) False
27. Which device is popularly used for measuring difference of low pressure?
    a) Inverted U-tube Differential Manometer
    b) U-tube Differential Manometer
    c) Inclined Single column manometer
    d) Vertical Single column manometer

28. What is the pressure in Pascals at a depth of 1m below the water surface?
    a. 98100 Pa
    b. 981 Pa

c. 98 Pa
d. 100 Pa

29. 15 bar equals to _____ Pascals.
    a. 10^5 Pa
    b. $1.5*10^6$ Pa
    c. 15 Pa
    d. 150 Pa
30. The pressure at any given point of a non-moving fluid is called the _____
    a. Gauge Pressure
    b. Atmospheric Pressure
    c. Differential Pressure
    d. Hydrostatic Pressure
31. What type of liquids are measured using a manometer?
    a. Heavy liquids
    b. Medium Liquids
    c. Light Liquids
    d. Heavy and light liquids
32. Which among these devices are the best suited for the measurement of high pressure liquids with high accuracy?
    a. Dead Weight Gauge
    b. Vacuum Gauge
    c. Manganin wire pressure
    d. Ionization Gauge
33. Define Viscosity?
    a. Resistance to flow of an object
    b. Resistance to flow of air
    c. Resistance to flow of fluid
    d. Resistance to flow of heat
34. Which one of the following is the unit of pressure?
    a. N
    b. N/m
    c. N/m^2
    d. kg
35. Which one of the following is the dimension of pressure?
    a. $M L^{-1} T^{-2}$
    b. $M L^{-1} T$
    c. $M L^{-1}$
    d. $M L^{1} T^{-3}$
36. Which one of the following statements is true regarding pressure?
    a. Pressure is a scalar quantity
    b. Pressure is a vector quantity
    c. Pressure is a scalar quantity only when the area is infinitesimally small
    d. Pressure is a vector quantity only when the area is infinitesimally small
37. After centrifugation when the sublimate settles, the clear liquid can
    a. Allowed rest
    b. Allowed to form a crystal
    c. Decanted off
    d. evaporated

38. After centrifugation, sublimate
    a. Dissolved completely
    b. Remains suspended in liquid
    c. Settles at the bottom
    d. Depends upon the PH of sublimate
39. An effective way of purifying liquids containing suspension is
    a. Crystallization
    b. Decanting
    c. Centrifuging
    d. Separating funnel
40. Fine insoluble solid particles can be removed through
    a. Crystallization
    b. Decanting
    c. Centrifuging
    d. Separating Funnel
41. Process quicker than filtration but not so effective is
    a. Decanting
    b. Centrifuging
    c. Crystallization
    d. Fractional distillation
42. Comprisable flow are
    a. Change in density with moderate change in temperature
    b. Density does not change with moderate change in temperature
    c. Both A & B
    d. None of the above
43. In comprisable flow are
    a. Change in density with moderate change in temperature
    b. Density does not change with moderate change in temperature
    c. Both A & B
    d. none of the above
44. Generally liquid are
    a. Comprisable
    b. In comprisable
    c. Both A & B
    d. None of these
45. Generally gases are
    a. Comprisable
    b. In comprisable
    c. Both A & B
    d. None of these
46. A gravity decanter is meant for the separation of two _____ density.
    a. immiscible liquids of different
    b. immiscible liquids of same
    c. miscible liquids of different
    d. miscible liquids of same
47. The process by which the fine particles is removed from liquid is as termed as
    a. Decantation
    b. flocculation

c. Sedimentation
d. Classification

48. In fluid mechanics a fluid is said to be hydrostatic equilibrium
    a. When fluid in motion
    b. When fluid in rest
    c. When fluid is dynamic
    d. When fluid is kinematic
49. Hydrostatic equilibrium is also called as
    a. Hydrostatic balance
    b. Hydrostatic imbalance
    c. Both A & B
    d. None of these
50. The Gravatitatonal field is directed
    a. Toward the earth
    b. Away from earth
    c. Has no direction
    d. None of these
51. Hydrodynamic equilibrium is applicable
    a. Ideal fluid
    b. Horizontal laminar fluid
    c. Both A & B
    d. None of these
52. In atmosphere the pressure of air decrease with
    a. Increasing attitude
    b. Decreasing attitude
    c. unrelated to attitude
    d. None of these
53. In atmosphere the pressure of air increases with
    a. Increasing attitude
    b. Decreasing attitude
    c. unrelated to attitude
    d. None of these
54. Boiling point at mountain
    a. Less than ground level
    b. More than ground level
    c. equal to ground level
    d. None of these
55. Which material generally used in manometer to measured height difference
    a. Water
    b. Mercury
    c. Methanol
    d. Ethanol
56. Kinematic viscosity
    a. Dynamic viscosity divided by density
    b. Dynamic viscosity divided by mass
    c. Dynamic viscosity divided by volume
    d. None of these
57. Kinematic viscosity S.I unit

a. m^2/s
b. m/s
c. m
d. kg/m

58. Generally water is
    a. Comprisable
    b. Incompressible
    c. Both A & B
    d. none of these

59. In _____flow, the velocity at any given time changes with respect to time.
    a. Uniform
    b. Laminar
    c. Turbulent
    d. Non-Uniform
60. _____ Flow is also known as streamline/viscous flow.
    a. Turbulent
    b. Laminar
    c. Uniform
    d. steady
61. Mass flow rate has S.I. unit
    a. kg
    b. kg/s
    c. m^3
    d. sec

UNIT 3 FLOW THROUGH PIPE

1. Each term in Bernoulli's equation represents the _____ of the fluid.
    a. Energy per unit mass
    b. Energy per unit weight
    c. Force per unit mass
    d. None of these
2. Which of the following assumption enables the Euler's equation of motion to be integrated?
    a. The fluid is incompressible
    b. The fluid is non-viscous
    c. Continuity equation is satisfied
    d. The flow is rotational & incompressible
3. The Bernoulli's equation in fluid dynamics is valid for _____
    a. Compressible flows
    b. Transient flow
    c. Continuous flows
    d. Viscous flows
4. Transitional length for a turbulent fluid entering into a pipe is around _____ times the pipe diameter.
    a. 5
    b. 50
    c. 500
    d. 1000
5. Which of the following assumption is incorrect in the derivation of Bernoulli's equation?
    a. The fluid is ideal
    b. The flow is steady
    c. The flow is incompressible
    d. The flow is rotational
6. The force present in a moving liquid is
    a. inertia force
    b. viscous force
    c. gravity force
    d. all of these
7. Water hammer is caused, when water flowing in a pipe is suddenly brought to rest by closing valve. The extent of pressure thus produced due to water hammer depends on the _____
    a. Pipe length
    b. Fluid velocity in the pipe
    c. Time taken to close the valve
    d. All of the above.
8. Pascal's law is valid only when the fluid is__ _____
    a. Frictionless and at rest
    b. At rest
    c. At rest and when the frictionless fluid is in motion
    d. None of these
9. The Bernoulli's equation is based on the assumption that
    a. there is no loss of energy of the liquid flowing
    b. the velocity of flow is uniform across any cross-section of the pipe

c. no force except gravity acts on the fluid
d. all of the above

10. Bernoulli's equation does not apply to the functioning of _____
    a. Venturimeter
    b. Orificem
    c. Pitot tube
    d. None of these
11. For an incompressible fluid, the bulk modulus of Elasticity is _____
    a. 5 Kg/m^3
    b. ∞ N/m^2
    c. 1 N
    d. 0 N/m
12. A fluid is a substance, that _____
    a. Has to be kept in a closed container
    b. Is almost incompressible
    c. Has zero shear stress
    d. Flows when even a small shear is applied to it
13. For a perfect incompressible liquid, flowing in a continuous stream, the total energy of a particle remains the same, while the particle moves from one point to another. This statement is called
    a. continuity equation
    b. Bernoulli's equation
    c. Pascal's law
    d. D.Archimede's principle
14. The total energy of a liquid particle in motion is equal to
    a. pressure energy + kinetic energy + potential energy
    b. pressure energy - (kinetic energy + potential energy)
    c. potential energy - (pressure energy + kinetic energy
    d. kinetic energy - (pressure energy + potential energy)
15. According to Bernoulli's equation
    a. $Z + \frac{p}{w} + \frac{v^2}{2g} = \text{constant}$
    b. $Z + \frac{p}{w} - \frac{v^2}{2g} = \text{constant}$
    c. $Z - \frac{p}{w} + \frac{v^2}{2g} = \text{constant}$
    d. $Z - \frac{p}{w} - \frac{v^2}{2g} = \text{constant}$
16. Bernoulli's equation is applied to
    a. venturimeter
    b. orifice meter
    c. pitot tube
    d. all of these

17. Boundary layers exists in flow _____
    a. Of real fluids
    b. Over flat surfaces only

c. In pipe only
d. Of ideal fluids only

18. Dimension of surface tension is _____
    a. ML^{-2}
    b. MT^{-2}
    c. MLT^{-2}
    d. $ML^{-2}T$
19. When the pipe Reynold's no. is 6000, the flow is generally_____
    a. Viscous
    b. Laminar
    c. Turbulent
    d. Transitional
20. For water, when the pressure increases, the viscosity_____
    a. Also increases
    b. Decreases
    c. Remains constant
    d. First decreases then increases
21. At low Reynold's no. _____
    a. Viscous forces are unimportant
    b. Viscous forces control
    c. Viscous forces control and inertial forces are unimportant
    d. Gravity forces control
22. Unsteady uniform flow is represented by flow through _____
    a. Long pipe at constant rate
    b. Long pipe at decrease rate
    c. Expanding tube at increase rate
    d. Expanding tube at constant rate
23. One poise is equivalent to _____
    a. gm/cm^2 *sec
    b. gm/cm *sec
    c. cm^2/sec
    d. m^2/sec
24. Fluid resistance to shear depends upon its _____
    a. Rate of transfer of molecular momentum
    b. Cohesion
    c. Both a. & b.
    d. Neither a. nor b.
25. With increase in the shear rate, the apparent viscosity of pseudoplatic fluids_____
    a. Increases
    b. Decreases
    c. Remains same
    d. May increase or decrease; depends on the magnitude of shear rate
26. In case of turbulent flow of fluid through a circular pipe, the_____
    a. Mean flow velocity is about 0.5 times the maximum velocity
    b. Velocity profile becomes flatter and flatter with increasing Reynold's no.
    c. Point of maximum instability exists at a distance of 2r/3 from the pipe wall (r=pipe radius)

d. Skin friction drag, shear stresses, random orientation of fluid particles and slope of velocity profile at the wall are more

27. Steady fluid flow occurs, when the derivative of flow variables satisfies _____
    a. $\frac{\partial}{\partial s} = 0$
    b. $\frac{\partial}{\partial t} = 0$
    c. $\frac{\partial}{\partial s} = constant$
    d. $\frac{\partial}{\partial t} = constant$
28. Which of the following has minimum compressibility?
    a. Water at room temperature
    b. Air at room temperature
    c. Oxygen at room temperature
    d. Nitrogen at room temperature
29. The velocity profile for a Bingham plastic fluid flowing under laminar conditions in a pipe is_____
    a. Parabolic
    b. Flat
    c. Flat near the wall & parabolic in middle
    d. Parabolic near the wall & flat in middle
30. Mach no. is the ratio of the speed of the _____
    a. Fluid to that of light
    b. Light to that of fluid
    c. Fluid to that of sound
    d. Sound to that of fluid
31. The total head of a liquid particle in motion is equal to
    a. pressure head + kinetic head + potential head
    b. pressure head - (kinetic head + potential head)
    c. potential head - (pressure head + kinetic head)
    d. kinetic head - (pressure head + potential head
32. Poise is converted into stoke by_____
    a. Multiplying with density (gm/cc)
    b. Dividing by density (gm/cc)
    c. Multiplying with specific gravity
    d. Dividing by specific gravity
33. Pressure co-efficient is ratio of pressure forces to _____ forces.
    a. Viscous
    b. Inertial
    c. Gravity
    d. Surface tension
34. Glass pipes can be joined by _____
    a. Flanges
    b. Welding
    c. Soldering
    d. Bell & spigot joint
35. For laminar flow of a shear thinning liquid in a pipe, if the volumetric flow rate is doubled, the pressure gradient will increase by a factor of _____
    a. 2

b. <2
c. >2
d. ½

36. .Bernoulli's equation can be derived from _____equation by integrating it
    a. euler's equation
    b. b.navier stokes's equation
    c. momentum equation
    d. none of above

37. For a free jet the maximum horizontal reach will depend on
    a. The angle of projection only
    b. Initial velocity
    c. Both A & B
    d. None of these
38. Bernoulli's equation is applicable for
    a. Steady flow
    b. unsteady flow
    c. Rotational flow
    d. None of these
39. In steady flow
    a. Velocity at particular point does not change
    b. Velocity at particular point change
    c. Both A & B
    d. None of these
40. In a flow along a varying flow cross section, as the area decreases
    a. The energy line will slope up
    b. The hydraulic gradient line will slope down
    c. The hydraulic gradient line will slope up
    d. None of these
41. Which type of head is present in Bernoulli's equation
    a. Pressure head
    b. kinetic head
    c. Datum head
    d. All of these
42. Pressure head S.I. unit
    a. m
    b. Sec
    c. m2
    d. kg
43. Tap water which comes our home is example of
    a. Laminar flow
    b. Turbulent flow
    c. Transition flow
    d. None of these
44. In flow all the steam line flow parallel to each other
    a. Laminar flow
    b. Turbulent flow
    c. Transition flow

d. None of these

45. If the Reynolds number is less than 2000 ,the flow in pipe
    a. Laminar
    b. Turbulent
    c. Transition
    d. None of these
46. A flow is called super sonic
    a. Velocity of flow is very high
    b. Discharge is difficult to measured
    c. Mach number is between 1 to 5
    d. Mach number is less than 1

47. A streamline is a line in flow field, _____
    a. That is traced by all the fluid particles passing through a given point
    b. Along which a fluid particle travels
    c. Such that at every point on it, the velocity is tangential to it
    d. None of these
48. _____ Forces do not act in case of fluid flow.
    a. Elastic
    b. Tensile
    c. Vibratory
    d. Centrifugal
49. Boundary layer separation is caused by the _____
    a. Reduction of pressure below vapour pressure
    b. Reduction of pressure gradient to zero
    c. Adverse pressure gradient
    d. Reduction of boundary layer thickness to zero
50. Identification of pipelines carrying different liquids and gases is done by the _____ of the pipe.
    a. Diameter
    b. Colour
    c. Altitude
    d. None of these
51. Pick out the correct statement.
    a. Human blood is a Newtonian fluid.
    b. A Newtonian fluid obeys Newton's law of cooling.
    c. In a Newtonian fluid at every point on it, the velocity is tangential to it.
    d. All of Above
52. What is the speed of sound (m/sec) in ordinary water?
    a. 1500
    b. 330
    c. 1000
    d. 3000
53. In atmosphere the pressure of air decrease with
    e. Increasing attitude
    f. Decreasing attitude
    g. unrelated to attitude
    h. None of these

54. In atmosphere the pressure of air increases with
    e. Increasing attitude
    f. Decreasing attitude
    g. unrelated to attitude
    h. None of these
55. Boiling point at mountain
    e. Less than ground level
    f. More than ground level
    g. equal to ground level
    h. None of these
56. Which material generally used in manometer to measured height difference
    e. Water
    f. Mercury
    g. Methanol
    h. Ethanol
57. Kinematic viscosity
    e. Dynamic viscosity divided by density
    f. Dynamic viscosity divided by mass
    g. Dynamic viscosity divided by volume
    h. None of these
58. Kinematic viscosity S.I unit
    e. m^2/s
    f. m/s
    g. m
    h. kg/m
59. Generally water is
    e. Comprisable
    f. Incompressible
    g. Both A & B
    h. none of these

60. In _____flow, the velocity at any given time changes with respect to time.
    e. Uniform
    f. Laminar
    g. Turbulent
    h. Non-Uniform
61. _____ Flow is also known as streamline/viscous flow.
    e. Turbulent
    f. Laminar
    g. Uniform
    h. steady
62. Mass flow rate has S.I. unit
    a. kg
    b. kg/s
    c. m^3
    d. Sec

UNIT 4 FLOW MEASUREMENT

1. Which is the cheapest device for measuring flow / discharge rate
    a. Venturimeter
    b. Pitot tube
    c. Orificemeter
    d. None of the above
2. The principle of Orificemeter is same as that of Venturimeter
    a. True
    b. False
3. What is the relationship between Orificemeter diameter and pipe diameter
    a. Orificemeter diameter is 0.5 times the pipe diameter
    b. Orificemeter diameter is one third times the pipe diameter
    c. Orificemeter diameter is one fourth times the pipe diameter
    d. Orificemeter diameter is equal to the pipe diameter
4. The Orificemeter readings are more accurate than Venturimeter
    a. True
    b. False
5. The Orificemeter readings are more accurate than Pitot tube readings.
    a. True
    b. False
6. The Orificemeter has a smooth edge hole
    a. True
    b. False
7. A nanometre is connected to a section which is at a distance of about 4 to 6 times the pipe diameter upstream from orifice plate
    a. True
    b. False
8. Venturimeter is based on integral form of Euler's equation
    a. True
    b. False
9. Orifice Meter can only be used for measuring rate of flow in open pipe like structure
    a. True
    b. False
10. Orifice meter consists of a flat rectangular plate
    a. True
    b. False
11. When orifice is called 'large orifice'?
    a. If the head of liquid is less than 5 times the depth of orifice
    b. If the head of liquid is less than 2.5 times the depth of orifice
    c. If the head of liquid is less Hence, 4 times the depth of orifice
    d. If the head of liquid is less than 1.5 times the depth of orifice
12. The MoM (Material of Manufacture) of notch is,
    a. Thermoplastic
    b. Metals
    c. Fiber
    d. Wood
13. Which of the following is not a way of classifying notches or weirs?
    a. Based on the shape of opening
    b. Based on the effect of the sides on the nappe
    c. Based on the shape of the crest
    d. Based on the effect of the sides on the crest
14. Which of the following is not a way of classifying based on the shape of opening?

a. Rectangular notch
b. Circular notch
c. Trapezoidal notch
d. Stepped notch

15. Trapezoidal weir has another popular name. What is it?
a. Cipolletti weir
b. Hagen Poiseuille's weir
c. Reynold's weir
d. Euler's weir

16. What is not the way of classifying weir based on their shape of crest?
a. Sharp crested weir
b. Broad crested weir
c. Narrow crested weir
d. Trapezoidal crested weir

17. What is not the way of classifying weir based on the emerging nappe?
a. Weir with end contraction
b. Weir without end contraction
c. Weir contraction at the beginning
d. Weir with absence of end contraction

18. The most common device used for measuring air speed is _____
a. altimeter
b. thermometer
c. pressure gauge
d. pitot tube

19. The randomness of the molecules gives us _____ pressure
a. Stagnation
b. Static
c. Dynamic
d. Absolute

20. How does the pitot tube help in measuring the airspeed?
a. Using temperature
b. Using velocity
c. Using mach number
d. Using the pressure difference

21. The instrument which combines both the static and total pressure is _____
a. Dynamic probe
b. Static probe
c. Pitot static probe
d. Stagnation probe

22. The dynamic pressure can be given by _____
a. difference of total and static pressure
b. sum of total and static pressure
c. product of total and static pressure
d. double of total and static pressure

23. When the local flow velocity is zero itself then _____
a. total pressure is not equal to static pressure
b. total pressure is equal to static pressure
c. 0
d. infinity

24. Pitot tube with flat faces are more sensitive.
a. True
b. False

25. In a pitot tube, the kinetic energy is converted into _____

a. potential energy
b. total energy
c. pressure energy
d. internal enrgy

26. The lower end of the pitot tube is bet at an angle of _____
a. 120 degrees
b. 90 degrees
c. 100 degrees
d. 45 degrees

27. The errors generated in the pitot tube due to the location are called _____
a. position errors
b. normal errors
c. negligible errors
d. positive errors

28. The pressure measured relative to vacuum is _____
a. total pressure
b. static pressure
c. dynamic pressure
d. absolute pressure

29. By a Rotameter we can measure
a. Specific gravity
b. pressure
c. Flow
d. Density

30. The pressure head of a flow meter remains constant for
a. Venturimeter
b. Orifice meter
c. Rotameter
d. Pitot tube

31. A venturimeter can not be used for the direct measurement of
a. datum difference in the stretch of pipeflow
b. pressure difference in the flow throughpipeline.
c. friction loss in pipe flow
d. All of these

32. A double acting reciprocating pump compared to a single acting pump (of almost same size working under same pressure levels) would give almost double
a. Head
b. Discharge
c. Efficiency
d. None of these

33. Which of the following is used for very accurate measurement of flow of gas at low velocity?
a. Pitot tube
b. Venturimeter
c. Rotameter
d. Hot wire annemometer

34. Venturimeters have
a. low head loss, high co-efficient of discharge and large size
b. low head loss, low co-efficient of discharge and small size
c. High head loss, high co-efficient of discharge and large size
d. None of these

35. Rotameter is a
a. drag force flow meter
b. variable area flow meter

c. Both A & B
d. None of these

36. Centrifugal pump is a_____
a. Turbo machinery
b. Flow regulating device
c. Drafting device
d. Intercooling device

37. The main function of centrifugal pumps are to _____
a. Transfer speed
b. Transfer temperature
c. Transfer pressure
d. Transfer energy

38. Centrifugal pumps transfer energy from _____
a. Rotor to fluid
b. Fluid to rotor
c. Draft to rotor
d. Rotor to draft

39. Which among the following control the flow rate?
a. Valve
b. Pump
c. Head
d. Tank pipe

40. Turbines and compressors work with the gas, while centrifugal pump transfers energy.
a. True
b. False

41. The inlet passage of water entry is controlled by _____
a. Head race
b. Gate
c. Tail race
d. Pump

42. Centrifugal pumps transport fluids by converting _____
a. Kinetic energy to hydrodynamic energy
b. Hydrodynamic energy to kinetic energy
c. Mechanical energy to kinetic energy
d. Mechanical energy to Hydrodynamic energy

43. With the increase in load, Energy in the turbine_____
a. Decreases
b. Increases
c. Remains unaffected
d. Independent

44. The rotational kinetic energy comes from _____
a. Engine motor
b. Pump
c. tank
d. Draft tube

45. The fluid coming into the centrifugal pump is accelerated by _____
a. Throttle
b. Impeller
c. Nozzle
d. None of these

46. A gear pump uses _____
a. Petrochemical pumps
b. Meshing of gears

c. Froth pumps
d. Airlift pumps

47. The most common pump used for hydraulic fluid power application is _____
a. Centrifugal pumps
b. Gear pumps
c. Froth pumps
d. Airlift pumps

48. The change of angular momentum in a pump is equal to the _____
a. Sum of speeds
b. Sum of individual momentum
c. Sum of temperatures
d. Sum of energy transferred from a body

49. Reciprocating pumps operate by drawing _____ into the chamber
a. Liquid
b. Pressure
c. Heat
d. Electricity

50. Reciprocating pumps are also called as _____
a. Force pumps
b. Mass Pumps
c. Heat pumps
d. Speed pumps

UNIT 5 TRANSPORTATION OF FLUID

1. Select the mechanical device, which increases the fluid energy
   a. Fan
   b. Pump
   c. Blower
   d. All above.

2. Pipe is
   a. Heavy walled
   b. Thin walled
   c. Both above
   d. None of these
3. Tube is
   a. Heavy walled
   b. Thin walled
   c. Both above
   d. None of these
4. Metal pipe is available in standard lenth about
   a. 1 m
   b. 2 m
   c. 3 m
   d. 6 m
5. Tubes from 6 m to 50 mmm are frequently made from
   a. Brass
   b. Copper
   c. Both above
   d. None
6. Pipe is relatively larger in diameter than tubing
   a. True
   b. false
7. Pipe surface is relatively
   a. Rough
   b. Smooth
   c. Both above
   d. None

8. tube surface is relatively
   a. Rough
   b. Smooth
   c. Both above
   d. None
9. .Pipe section may be joined by
   a. Screwing
   b. Flanging
   c. Welding
   d. All above
10. Pipe section joined by
    a. Brazing
    b. Soldering
    c. Both
    d. None
11. Changing the pipe line diameter
    a. Reducer
    b. Union
    c. Nipple
    d. None
12. Branching the pipe line
    a. Tee
    b. Cross

c. Both
d. None

13. Controlling the flow rate through pipeline
    a. Tee
    b. Cross
    c. Valves
    d. None
14. Joining two pipe pieces.
    a. Union
    b. Nipple
    c. Both above
    d. None
15. A valve is a device used
    a. control flow rate
    b. Shut off the flow
    c. Both
    d. None
16. Gate valves are commonly used to
    a. Stop the flow
    b. Minimise the pressure drop in open position
    c. Both above
    d. None

17. Needle valve is modification of
    a. Globe valve
    b. Gate valve
    c. Control valve
    d. None
18. Needle valve used
    a. For an accurate control the flow
    b. Does not control the flow
    c. Both above
    d. None
19. Select the correct valves which is used in on –off services
    a. Plug valve
    b. Ball valve
    c. Both above
    d. None
20. Non return valve is used when
    a. Accurate control the flow
    b. Unidirectional flow
    c. On –off service
    d. None of these
21. Diaphragm valves are used
    a. Viscous liquid
    b. Slurries
    c. Corrosive liquid
    d. All above
22. Butterfly valve is used in
    a. Large size pipe line
    b. Control the flow
    c. Both above
    d. None
23. Control valves used
    a. Controllong the flow manually
    b. Controlling the flow automatically.
    c. Bothvabove
    d. None
24. The main function of centrifugal pumps are to _____
    a. Transfer speed

b. Transfer temperature
c. Transfer pressure
d. Transfer energy

25. Centrifugal pumps transfer energy from _____
a. Rotor to fluid
b. Fluid to rotor
c. Draft to rotor
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36. Reciprocating pumps operate by drawing _____ into the chamber
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b. Pressure
c. Heat

d. Electricity

37. Reciprocating pumps are also called as _____
    a. Force pumps
    b. Mass Pumps
    c. Heat pumps
    d. Speed pumps
38. Which one of the following is used to control the flow of water
    a. Swing check valve
    b. Globe valve
    c. Gate valve – rising stem
    d. Gate valve – non rising stem
39. Gate valve permits water flow in
    a. Straight line
    b. Angular
    c. Right angle
    d. None of the above
40. Which one of the following materials is used for manufacturing non-return valve
    a. Mild steel
    b. Aluminium
    c. Bronze
    d. Lead
41. What is the function of a butterfly valve?
    a) On/ off control
    b) Flow regulation
    c) Pressure control
    d) Hydraulic control
42. Which of the following valves is better for on/ off control?
    a) Ball valve
    b) Butterfly valve
    c) Gate valve
    d) Knife valve,
43. Check valve is also called as _____
    a) Non-return valve
    b) Gate valve
    c) Knife valve
    d) Choke valve
44. Diaphragm valves are used to control flow by a movement of a diaphragm.
    a) True
    b) False
45. In globe valves, the flow rate control is determined by _____
    a) Size of the opening
    b) Lift of the valve plug
    c) Pressure difference
    d) Gravity
46. Of the below mentioned valves which of these are used to control the flow of liquid in a single direction?
    a) Butterfly valve
    b) Ball valve
    c) Check valve
    d) Plug valve
47. Which of these are used as throttling valves?
    a) Butterfly valve
    b) Check valve
    c) Gate valve
    d) Sluice valve
48. Check valves are used only to prevent back flow; they are one-way valves.
    a. True
    b. False
49. Plug valves are similar to ball valves except that the plug is conical rather than spherical.
    a. True
    b. False

50. A bolt, screw, stud and nuts all are temporary fasteners.
    a. True
    b. False
51. Overall efficiency of a centrifugal pump is the ratio of
    a. Energy available at the impeller to the energy supplied to the pump by the primemover
    b. Actual work done by the pump to the energy supplied to the pump by the prime mover
    c. Energy supplied to the pump to the energy available at the impeller
    d. Manometric head to the energy supplied by the impeller per Newton of water
52. Discharge of a centrifugal pump is
    a. Directly proportional to N
    b. Inversely proportional to N
    c. Directly proportional to N2
    d. Inversely proportional to N2
53. A centrifugal pump is superior to a reciprocating pump because
    a. It is a high speed pump
    b. It is more economical
    c. It gives smooth flow
    d. All the above
54. In a reciprocating pump, air vessels are used to
    a. Reduce the flow
    b. Increase the delivery head
    c. Smoothen the flow
    d. Reduce the acceleration head
55. Discharge of a centrifugal pump is proportional to .....
    a. D^2
    b. D^3
    c. $1/D^3$
    d. $1/D^2$
56. In a centrifugal pump the liquid enters the pump .....
    a. At the top
    b. At the bottom
    c. At the centre
    d. From sides
57. Which of the following are functions of bearings?
    a) Ensure free rotation of shaft with minimum friction
    b) Holding shaft in a correct position
    c) Transmit the force of the shaft to the frame
    d) All of the listed

a. A radial bearing supports the load that acts along the axis of the shaft.
    a) True
    b) False

58. A_____ bearing supports the load acting along the axis of the shaft.
    a) Thrust
    b) Thrust
    c) Longitudinal
    d) Transversal
59. Which one of the following is used to separate the connection without disturbing the pipe line
    a. Union
    b. Plug
    c. Socket
    d. Cross
60. Which one of the following accommodate four pipes in pipe fitting
    a. Socket
    b. Elbow
    c. Tee
    d. Cross
61. .Which one of the following is used for making a branch right angle to the main line in pipe fitting?
    a. Union
    b. Elbow
    c. Tee

d. Flange

62. For small discharge at high -pressure following pump is preferred .....
    a. Centrifugal
    b. Axial flow
    c. Mixed flow
    d. Reciprocating
63. Check valve is also called Non-return valve
    a. True
    b. False
64. Globe valve used to control the flow of water
    a. True
    b. False
65. Pipe surface is relatively smooth
    a. True
    b. False
66. tube surface is relatively smooth
    a. True
    b. False

UNIT NO 6 CONVEYING AND FLUIDIZATION.

1. In the packed bed, at relatively low flow rates pressure drop is approximately proportional to gas velocity, true or false?
    a. True
    b. False
2. Before the pressure drop stabilizes after the bed gets fluidized, what is the position of pressure drop before reaching minimum fluidization?
    a. Above the constant
    b. Below the constant
    c. Equal
    d. Hard to tell
3. How the gas behaves across the fluidized bed, when the velocity is more than minimum fluidization?
    a. Bubbles formation
    b. Slugs formation
    c. Smooth flow
    d. None of the mentioned
4. How the liquid behaves across the fluidized bed, when the velocity is more than minimum fluidization?
    a. Bubbles formation
    b. Slugs formation
    c. No bubbles
    d. None of the mentioned
5. What is one of the reason for poor fluidization beds in terms of pressure drop?
    a. Slugging
    b. Low velocity
    c. Light particles
    d. All of the mentioned
6. What does the minimum fluidization velocity in the bed depends on?
    a. Size distribution of solids
    b. Pumping power
    c. Diameter of bed
    d. All of the mentioned
7. When the bed is just fluidized the height attained is maximum, true or false?
    a. True
    b. False
8. What can be done in order to prevent slugging in the fluidized bed?
    a. Baffles
    b. Increase diameter
    c. Proper design of distributor
    d. All of the mentioned
9. What is the advantage of fluidized bed over spouted bed and teeter bed in the drying process?
    a. Presence of distributor
    b. Reactor sizes
    c. Presence of cyclone separators
    d. None of the mentioned
10. In case of naphtha cracking, use of batch type is better than circulation type fluidized bed?
    a. True
    b. False
11. What is the mesh range of particles required in the fluidized bed for best efficiency?

a. 1-10 mesh
b. 5-50 mesh
c. 50-100 mesh
d. 20-200 mesh

12. In a fluidized bed reactor, what is the best way to achieve maximum heat and mass transfer rates?
    a. Using small particles
    b. Using large particles
    c. Simply dumping the particle and passing gas will do the job
    d. Increasing the gas flow rates
13. What is the best way for reducing load on cyclone separators in the fluidized mixer for powdery material?
    a. Using multiple cyclones
    b. Increasing the gas flow rate
    c. Increasing the solids mass rate
    d. None of the mentioned

14. What is the latest technology being used for transportation of solid particles in cement industries?
    a. Pneumatic fluidized transportation
    b. Conveyor belts
    c. Buckets
    d. Trucks
15. Among the following processes which provides the most economic means in cement industry?
    a. Fluidization process
    b. Mixing process with agitator
    c. Batch Reactor
    d. All of the mentioned
16. Transportation through fluidization using more power than any other process, true or false?
    a. True
    b. False
17. Which kind of fluid is included to obtain smooth fluidization?
    a. Water
    b. Air
    c. Oxygen
    d. Nitrogen
18. Air is introduced in the bed to fluidize the bed in the bubble form, true or false?
    True
19. What is the best way to prevent load on the dust collectors in the fluidized bed reactor?
    a. Up flow beds
    b. Down flow beds
    c. Side flow beds
    d. None of the mentioned
20. In drying processes, how important is the inclusion of fluidized bed?
    a. Most efficient drying
    b. Somewhat better than spouted bed and less than teeter bed
    c. Drying is best all the beds
    d. Least efficient drying

21. Efficiency in fluidized bed for any process is the highest when compared with any other beds, true or false?
    a. True
    b. False

22. First commercial fluidized bed for gasification of powdered coal which was awarded patent in 1922, was developed by?
    a. Fritz Winker
    b. Colburn Jake
    c. Dolph Jagger
    d. Cameron John
23. Which bed shown below, can provide with remarkable temperature uniformity for highly exothermic and temperature sensitive reactions?
    a. Fluidized bed reactor
    b. Spouted bed
    c. Teeter bed
    d. Batch reactor
24. Which of the following application is a belt conveyor used for?
    a. Material transportation over long distances
    b. Material transportation within premises
    c. Material transportation for processing
    d. All of the mentioned
25. Statement 1: It is generally not possible to change the direction of flow with belt conveyors.
    Statement 2: If belt conveyors are to be used in the bent position, slat belts are used.
    a. True, False
    b. True, True
    c. False, False
    d. False, True
26. Statement 1: Belt conveyors cannot be used in the inclined position.
    Statement 2: Screw conveyors can carry more amount of load compared to belt conveyors.
    a. True, False
    b. True, True
    c. False, False
    d. False, True
27. In the specifications of a screw conveyor, the shaft length is shorter than the flight length.
    a. True
    b. False
28. Statement 1: Chain drive rollers move faster than belt driven rollers.
    Statement 2: Screw conveyors are used in the feeding of raw materials like wheat or chilly into the grinding unit to make a powder out of it.
    a. True, False
    b. True, True
    c. False, False
    d. False, True
29. Pneumatic conveying is done under which of the mentioned conditions?
    a. High pressure
    b. Vacuum
    c. Fluidization
    d. Any of the mentioned
30. Statement 1: Bucket conveyors can be divided into close and spaced bucket conveyors.

Statement 2: Bucket conveyors can be divided into centrifugal and positive discharge bucket conveyors.

a. True, False
b. True, True
c. False, False
d. False, True

31. Which of the following is NOT an advantage of mechanical transportation?
    a. Transportation is economical and quick
    b. Handling is contamination free
    c. No human injury
    d. None of the mentioned

32. In food industry, the animal processing sector requires mechanical transportation to minimize human intervention and to maintain hygiene.
    a. True
    b. False

33. Which of the following does NOT include the application of material handling and transportation in food processing?
    a. Fruits and vegetables processing
    b. Cereals and pulses processing
    c. Spices and condiments processing
    d. All of the mentioned

34. What is the flow rate of materials in a bucket conveyor dependent on?
    a. Shape of the buckets
    b. Spacing of the buckets
    c. Speed of the conveyor
    d. All of the mentioned

35. Pneumatic systems usually do not exceed:
    a. 1 hp
    b. 1 to 2 hp
    c. 2 to 3 hp
    d. 4 to 5 hp

36. Most hydraulic circuits:
    a. Operate from a central hydraulic power unit
    b. Use air-over-oil power units
    c. Have a dedicated power unit
    d. Does not have dedicated power unit

37. Hydraulic and pneumatic circuits:
    a. Perform the same way for all functions
    b. Perform differently for all functions
    c. Perform the same with some exceptions
    d. Does not perform all the functions

38. The lubricator in a pneumatic circuit is the:
    a. First element in line
    b. Second element in line

c. Last element in line
d. Third element in line

39. When comparing first cost of hydraulic systems to pneumatic systems, generally they are:
    a. More expensive to purchase
    b. Less expensive to purchase
    c. Cost is same
    d. Cost is not required

40. The most common hydraulic fluid is:
    a. Mineral oil
    b. Synthetic fluid
    c. Water
    d. Gel
41. On what difference does the pneumatic system works?
    a. Speed
    b. Pressure
    c. Area
    d. Length
42. According to Brown, fractional voids in the packed bed are related to _____ of particles?
    a. Shape
    b. Size
    c. Sphericity
    d. None of the mentioned

43. The pressure drop through the fixed beds of uniformly sized solids has been correlated by _____
    a. Ergun equation
    b. Poisson equation
    c. Laplace equation
    d. None of the mentioned
44. Fluidization occurs when: Drag force by the upward moving gas _____
    a. Weight of the particle
    b. Weight of the fluid
    c. Volume of the bed
    d. Pressure drops across bed

45. Fluidization expression is compared with which equation from fluid mechanics?
    a. Euler's equation
    b. Bernoulli's equation
    c. Buoyancy equation
    d. Navier–Stokes equation
46. Minimum Fluidizing equation can be expressed in terms of which physical quantity?
    a. Pressure drop
    b. Temperature
    c. Velocity
    d. Volume
47. What is the sphericity of sharp sand particles?
    a. 0.67
    b. 0.86

c. 0.63
d. 0.58

48. On comparison with Fluidized bed and Packed bed, which has the highest voidage?
    a. Fluidized bed
    b. Packed bed
    c. Pressure drop
    d. All of the mentioned
49. The velocity of fluid is operated between minimum fluidizing velocity (Umf) and Pneumatic velocity in fluidized bed, true or false?
    a. True
    b. False
50. When the diameter is narrower of the bed, which kind of problem is most likely to occur in the bed?
    e. Channeling
    f. Slugging
    g. Entrainment
    h. None of the mentioned