1. Ideal gas law is best obeyed by gases at
   a. Low pressure, high temperature
   b. High pressure, low temperature
   c. Low pressure, low temperature
   d. High pressure

2. Second law of thermodynamics is concerned with
   a. Amount of energy transferred
   b. Direction of energy transferred
   c. Irreversible processes only
   d. Non-cyclic processes only

3. Degrees of freedom at triple point will be
   a. 0
   b. 1
   c. 2
   d. 3

4. Pick out the extensive property out of the following
   a. Surface tension
   b. Free energy
   c. Specific heat
   d. Refractive index

5. Screen efficiency is
   a. Recovery/rejection
   b. Recovery
   c. Rejection
   d. None of these

6. The loss due to sudden contraction is proportional to
   a. Velocity
   b. Velocity head
   c. Turbulence
   d. None of these

7. Newton’s law of viscosity relates
   a. Shear stress and velocity
   b. Velocity gradient and pressure intensity
   c. Shear stress and rate of angular deformation
   d. Pressure gradient and rate of angular deformation

8. Pressure drop in fluidized bed reactor is _____ that in a similar packed bed reactor
   a. Less than
   b. More than
   c. Same as
   d. None of these

9. Unit of mass velocity is
   a. Kg/m.hr
   b. Kg/m^2.hr
   c. Kg/hr
   d. Kg/m^2
10. Cavitation occurs in a centrifugal pump when the suction pressure is
   a. Equal to the developed head
   b. Greater than the vapor pressure of the liquid at that temperature
   c. Equal to the vapor pressure
   d. Less than the vapor pressure of the liquid at that temperature

11. CaCO₃ contains ____ percent of Ca by weight
   a. 40
   b. 48
   c. 96
   d. 12

12. A limiting reactant is the one which decides the ____ in a chemical reaction
   a. Equilibrium constant
   b. Conversion
   c. Rate constant
   d. None of these

13. Fugacity and pressure are numerically equal when the gas is
   a. In standard state
   b. In ideal state
   c. At low temperature
   d. At high pressure

14. Number of gm moles of solute dissolved in 1 litre of a solution is called its
   a. Equivalent weight
   b. Molarity
   c. Molality
   d. Normality

15. Number of gm moles of solute dissolved in 1Kg of solvent is called its
   a. Molality
   b. Molarity
   c. Normality
   d. Formality

16. With the increase in temperature, the heat capacity of a substance
   a. Increases
   b. Decreases
   c. Remains unchanged
   d. Depends on the substance

17. The velocity profile for turbulent flow through a closed conduit is
   a. Logarithmic
   b. Parabolic
   c. Hyperbolic
   d. linear

18. In a fluidized bed reactor
   a. Temperature gradients are very high
   b. Temperature is more or less uniform
   c. Hot spots are formed
   d. Segregation of the solids occurs

19. A vapor whose partial pressure is less than its equilibrium vapor pressure is called a ____ vapor
   a. Saturated
   b. Supersaturated
   c. Superheated
   d. Sub-cooled
20. For sizing of fine materials, the most suitable equipment is a
   a. Trammel  c. Shaking screen
   b. Grizzly  d. Vibrating screen

21. Which is most suitable for transportation of sticky material
   a. Apron conveyor  c. Screw conveyor
   b. Belt conveyor  d. Pneumatic conveyor

22. Ball mill is used for
   a. Crushing  c. Fine grinding
   b. Coarse grinding  d. attrition

23. 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. Capacity and effectiveness of the screen is decreased

24. Viscosity of gases ____ with increase in temperature
   a. Increases very rapidly  c. Decreases slowly
   b. Increases slowly  d. Remains unaffected

25. Heat transfer co-efficient for liquid increases with
   a. Decrease in temperature  d. Increase in pressure
   b. Increase in temperature
   c. Decrease in Reynolds number

26. Dropwise condensation occurs on ____ surfaces
   a. Clean and dirt free  c. Contaminated and cooling
   b. Smooth and clean  d. polished

27. The number of Kg vaporized per Kg of steam fed to the evaporator is defined as
   a. Capacity  c. Economy
   b. Rate of evaporation  d. Rate of vaporization

28. Multiple effect evaporators are used to
   a. Increase the steam economy & decrease the capacity
   b. Increase the steam economy & the capacity
   c. Decrease the steam economy & the capacity
   d. Decrease the steam economy & increase the capacity
29. Baffles are provided in heat exchangers to increase the
   a. Fouling factor
   b. Heat transfer area
   c. Heat transfer coefficient
   d. Heat transfer rate

30. Finned tube heat exchangers
   a. Give larger area per tube
   b. Use metal fins of low thermal conductivity
   c. Facilitate very large temperature drop through tube wall
   d. Are used for smaller heat load

31. As the reflux ratio in a continuous counter current extraction is increased, the number of stages
   a. Increase
   b. Decrease
   c. Remains unchanged
   d. Can either increase or decrease depending on the system

32. Flooding results in
   a. High tray efficiency
   b. Low tray efficiency
   c. High gas velocity
   d. Good contact between the fluids

33. Very tall packed towers are divided into series of beds to
   a. Reduce the overall pressure drop
   b. Avoid channeling
   c. Reduce liquid hold-up
   d. Avoid flooding

34. Reactions with high activation energy are
   a. Highly temperature sensitive
   b. Temperature insensitive
   c. Always irreversible
   d. Always reversible

35. With decrease in temperature, the equilibrium conversion of a reversible endothermic reaction
   a. Decreases
   b. Increases
   c. Remains unaffected
   d. Increases linearly with temperature

36. Which of the following is a characteristic of an ideal PFR
   a. Axial dispersion
   b. Flat velocity profile
   c. Uniform mixing
   d. Radial dispersion
37. A batch reactor is
   a. Suitable for gas phase reactions on a commercial scale
   b. Suitable for liquid phase reactions involving small production rate
   c. Least expensive to operate for a given rate
   d. Most suitable for very large production rate

38. Which of the following is the most suitable for very high pressure gas-phase reactions
   a. Batch reactor
   b. Tubular flow reactor
   c. Stirred tank reactor
   d. Fluidized bed reactor

39. Catalyst carriers
   a. Have very high selectivity
   b. Increase the activity of a catalyst
   c. Provide large surface area with a small amount of active material
   d. Inhibit catalyst poisoning

40. The rate constant of a chemical reaction decreases by decreasing the
   a. Pressure
   b. Concentration of reactants
   c. Temperature
   d. Duration of reaction

41. Which of the following relationship is not correct in case of a chemical process plant
   a. Manufacturing cost = direct production cost + fixed charges + plant over head cost
   b. General expenses = administrative expenses + distribution & marketing expenses
   c. Total product cost = manufacturing cost + general expenses
   d. Total product cost = direct production cost + plant overhead cost

42. Effluent treatment cost in a chemical plant is categorized as _____ cost
   a. Fixed
   b. Overhead
   c. Utilities
   d. Capital

43. Utilities cost in the operation of a chemical process plant comes under the
   a. Overhead cost
   b. Fixed charges
   c. Direct population cost
   d. General expenses

44. In financial accounting of a chemical plant, which of the following relationship is invalid
   a. Assets = equities
   b. Assets = liabilities + net worth
   c. Total income = cost + profits
   d. Assets = capital
45. Response of a linear control system for a change in set point is called
   a. Frequency response  c. Servo problem
   b. Transient response  d. Regulator problem

46. Thermal wells are used in temperature measurement to
   a. Guard against corrosive and oxidizing action on thermocouple materials
   b. Reduce measuring lag
   c. Increase the fidelity
   d. Increase the sensitivity

47. Which of the following controllers has the least maximum deviation
   a. P controller  c. P-I-D controller
   b. P-I controller  d. P-D controller

48. Which of the following flow-metering instruments is an area-meter
   a. Venturimeter  c. Pitot tube
   b. Rotameter  d. Hot wire anemometer

49. Use of I-control along with P-control facilitates
   a. Elimination of offset  c. Reduction of stability time
   b. Reduction of offset  d. None of these

50. The fluid used in hydraulic controller is
   a. Water  c. Air
   b. Steam  d. Oil

51. Gypsum is chemically
   a. Calcium chloride  c. Sodium sulphate
   b. Potassium sulphate  d. Calcium sulphate

52. Free alkali in a toilet soap is ______ that in a laundry soap.
   a. Less than  c. More than
   b. Same  d. None

53. Which oil is preferred for paint manufacture
   a. Drying oil  c. Semi-drying oil
   b. Non-drying oil  d. Saturated oil

54. High temperature carbonization produces
   a. Inferior coke compared to low temperature carbonization
   b. Less of gases compared to liquid products
   c. Larger quantity of tar compared to low temperature carbonization
   d. None of these
55. Most commonly used rubber vulcanizing agent is
   a. Sulphur
   b. Bromine
   c. Platinum
   d. Alumina

56. In Urea production, undesired product is _____
   a. Biuret
   b. Ammonia
   c. Ammonium carbamate
   d. Water

57. Catalyst used in catalytic reforming is
   a. Platinum on alumina
   b. Nickel
   c. Iron
   d. Aluminium chloride

58. The catalyst used in shift converter is
   a. Nickel
   b. Vanadium
   c. Silica Gel
   d. Alumina

59. Catalyst used in catalytic cracking is
   a. Silica-alumina
   b. Silica gel
   c. Vanadium pentoxide
   d. Nickel

60. The main aim of cracking is to produce
   a. Gasoline
   b. Lube Oil
   c. Petrolatum
   d. Coke
| Q.NO | | | |
|------|------|------|
| 1)   | a    | 21)  | c    |
| 2)   | b    | 22)  | c    |
| 3)   | a    | 23)  | a    |
| 4)   | b    | 24)  | b    |
| 5)   | d    | 25)  | b    |
| 6)   | b    | 26)  | c    |
| 7)   | c    | 27)  | c    |
| 8)   | b    | 28)  | a    |
| 9)   | b    | 29)  | c    |
| 10)  | d    | 30)  | a    |
| 11)  | a    | 31)  | b    |
| 12)  | b    | 32)  | b    |
| 13)  | b    | 33)  | b    |
| 14)  | b    | 34)  | a    |
| 15)  | a    | 35)  | a    |
| 16)  | a    | 36)  | b    |
| 17)  | a    | 37)  | b    |
| 18)  | b    | 38)  | b    |
| 19)  | c    | 39)  | c    |
| 20)  | d    | 40)  | c    |
| 41)  | c    | 42)  | b    |
| 43)  | c    | 44)  | a    |
| 45)  | c    | 46)  | a    |
| 47)  | d    | 48)  | b    |
| 49)  | a    | 50)  | d    |
| 51)  | d    | 52)  | a    |
| 53)  | a    | 54)  | d    |
| 55)  | a    | 56)  | a    |
| 57)  | a    | 58)  | a    |
| 59)  | a    | 60)  | a    |