# CHEMICAL ENGINEERING

1. Bernoulli's equation for steady frictionless, continuous fluid flow states that the ________ is same at all sections.

   (A) total energy
   (B) total pressure
   (C) velocity head
   (D) total mass

2. Most commonly used joint in the underground pipe lines is the

   (A) flange
   (B) coupling
   (C) sleeve joint
   (D) expansion joint

3. Quicksand is an example of a _____ fluid

   (A) Bingham plastic
   (B) dilatant
   (C) Newtonian
   (D) Pseudo – plastic

4. In the venturi meter, the velocity ______ in the upstream cone.

   (A) decreases
   (B) remains constant
   (C) increases
   (D) becomes zero

5. _____ is defined as the ratio of the shear stress to the product of the velocity head and density.

   (A) Drag force
   (B) Drag coefficient
   (C) Friction factor
   (D) Coefficient of discharge

6. Number of gm moles of solute dissolved in one litre of a solution is called its

(A) equivalent weight
(B) molarity
(C) molality
(D) normality

7. A bypass stream in a chemical process is useful because it

(A) facilitates better control of the process
(B) improves the conversion
(C) increases the product yield
(D) enriches the product quality

8. A limiting reactant is the one which decides the ______ in the chemical reaction

(A) equilibrium constant
(B) reaction order
(C) rate constant
(D) conversion

9. A gaseous mixture contains 14 kg of $N_2$, 16 kg of $O_2$ and 17 kg of $NH_3$. The mole fraction of oxygen is

(A) 0.16
(B) 0.66
(C) 0.25
(D) 0.47

10. Kirchhoff's equation relates heat of reaction with

(A) pressure
(B) volume
(C) number of moles
(D) temperature

11. Urea sample contains 42 grams nitrogen by mass. The actual quantity of urea sample is ____. (molecular formula of urea is $CH_4N_2O$ and molecular weight = 60 gm mol)

(A) 90 grams
(B) 80 grams
(C) 95 grams
(D) 60 grams

12. 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) $\sqrt{3}$

13. The work required in crushing is proportional to the new surface created. This is the statement of _____ crushing law.

(A) Kick's
(B) Rittinger's
(C) Bond's
(D) Hooke's

14. Solids may be broken using a hammer by ______ type of action

(A) compression
(B) attrition
(C) impact
(D) cutting

15. _____ is an example for filter aid used to increase filtration rate.

(A) α - amino acid
(B) lignin
(C) diatomaceous earth
(D) sucrose

16. The SI unit of filter medium resistance is

(A) $m^{-1}$
(B) $m^2/gm$
(C) m/kg
(D) kg $m^{-2}$

17. During filtration, as time passes the pressure drop across the unit

(A) always decreases
(B) remains constant
(C) first increase and then decrease
(D) always increases

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

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

19. The raw materials required for the manufacture of soda ash by Solvay process are

(A) brine, limestone and coal
(B) ammonia, $CO_2$ and slaked lime
(C) ammonia, CO and calcium sulphate
(D) sulphur, oxygen and ammonia

20. Rancidity of fatty oil can be reduced by its

(A) decoloration
(B) hydrogenation
(C) oxidation
(D) hydrolysis

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

(A) viscosity
(B) thermal conductivity
(C) density
(D) surface tension

22. Thinner is added along with paint to

(A) accelerate the oxidation of oil
(B) prevent gelling of paint
(C) suspend pigments and dissolve film forming materials
(D) form a protective film

23. The ideal pulp for the manufacture of paper should have high ______ content.

(A) chlorophyll
(B) lignin
(C) iron
(D) cellulose

24. Ziegler process

(A) employs high pressure
(B) produces high density polyethylene
(C) uses no catalyst
(D) produces low density polyethylene

25. The raw materials required for the manufacture of Nylon – 66 are

(A) hexamethylene diamine and adipic acid
(B) caprolactum and epoxy resin
(C) hexamethylene diamine and maleic anhydride
(D) dimethyl terephthalate and ethylene glycol

26. Alum is used as a coagulant in water treatment to remove

(A) color
(B) turbidity
(C) bacteria
(D) All of the above

27. Hydrazine ($N_2H_4$) is used mainly as an

(A) explosive
(B) detergent additive
(C) rocket fuel
(D) antibiotic

28. Bakelite is a type of _________ resin

(A) polyacrylic
(B) phenol – formaldehyde
(C) urea – formaldehyde
(D) polyester

29. Heat flux is the time rate of heat transfer per unit

(A) length
(B) cross sectional area
(C) volume
(D) thickness

30. _____ number is the ratio between the temperature gradient at the wall to the average temperature gradient across the entire pipe.

(A) Grashof
(B) Fourier
(C) Rayleigh's
(D) Nusselt

31. Grashof number is the ratio between ______ and viscous force.

(A) thermal diffusivity
(B) heat capacity
(C) buoyancy force
(D) gravity force

32. ______ usually condense in the dropwise manner.

(A) steam
(B) glycerine
(C) nitrobenzene
(D) liquid metals

33. For cross sections other than circular, equivalent diameter is defined as ____ times the hydraulic radius.

(A) two
(B) ten
(C) five
(D) four

34. Transmissivity of an opaque solid is

(A) unity
(B) zero
(C) infinity
(D) negative

35. Baffles are installed in the shell side of a heat exchanger to

(A) promote cross flow and raise the average velocity of the shell side fluid
(B) minimize the cost of heat exchanger
(C) increase the heat transfer area
(D) avoid the scale formation

36. The diffusivity (D) in a binary gas mixture is related to the temperature (T) as

(A) D α T
(B) D α $T^{1.5}$
(C) D α $T^{0.5}$
(D) D α $T^{2}$

37. The enrichment of the vapour stream as it passes up through the distillation column in contact with reflux is called

(A) reforming
(B) by passing
(C) rectification
(D) channeling

38. Azeotropic distillation is employed to separate

(A) heat sensitive materials
(B) high boiling mixture
(C) mixture with very high relative volatility
(D) constant boiling mixture

39. Milk powder is manufactured using _____ dryer.

(A) spray
(B) freeze
(C) tray
(D) rotary

40. Radioactive nuclear waste is treated in

(A) mixer settler extractor
(B) rotating disc contactor
(C) pulsed column extractor
(D) Bollman extractor

41. Decaffeination of coffee is a practical example of _______ process

(A) adsorption
(B) desorption
(C) super critical fluid extraction
(D) leaching

42. Wetted wall tower is used in the measurement of

(A) thermal diffusivity
(B) mass diffusivity
(C) viscosity of liquid
(D) mass transfer coefficient

43. The thermostat mechanism to control temperature in water heaters used in houses is ______ type controller.

(A) proportional
(B) proportional – derivative
(C) pneumatic
(D) on-off

44. Wet bulb and dry bulb temperatures become identical at ____ percent saturation curve

(A) 50
(B) 75
(C) 25
(D) 100

45. Sherwood number in mass transfer is analogous to the _____ number of heat transfer

(A) Grashof
(B) Biot
(C) Nusselt
(D) Froude

46. The step response of a first order system reaches _____ of its ultimate value when the time elapsed is equal to one time constant.

(A) 50%
(B) 75%
(C) 63.2%
(D) 99%

47. For step response of a second order system, when the damping ratio $\zeta < 1$ the response is said to be

(A) critically damped
(B) over damped
(C) non oscillatory
(D) under damped

48. An example for final control element in a control system is

(A) reactor
(B) control valve
(C) thermometer
(D) comparator

49. Use of integral control along with proportional control facilitates

(A) elimination of offset
(B) elimination of transportation lag
(C) reduction of stability time
(D) the increase in error signal strength

50. The forcing function used in frequency response analysis is

(A) step
(B) pulse
(C) sinusoidal
(D) ramp

51. For plotting the Bode diagram graphs, the variables required are

(A) amplitude ratio, frequency and phase angle
(B) amplitude ratio, frequency and time
(C) amplitude ratio, frequency and controller gain
(D) root locus, frequency and offset

52. An example for intensive property is

(A) mass
(B) density
(C) volume
(D) number of moles

53. Efficiency of a heat engine working on Carnot cycle between two temperature levels depends upon the

(A) volume of working fluid
(B) pressure of working fluid
(C) mass of working fluid
(D) two temperatures only

54. Compressibility factor of an ideal gas is

(A) zero
(B) unity
(C) negative
(D) infinity

55. Entropy is a measure of the ______ of a system

(A) disorder
(B) orderly behaviour
(C) temperature changes
(D) energy content

56. Fugacity and pressure are numerically equal, when the gas is

(A) in standard state
(B) at high pressure
(C) at low temperature
(D) in ideal state

57. Van Laar equation deals with the activity coefficients in ______ solution

(A) binary
(B) ternary
(C) azeotropic
(D) multi component

58. During Joule – Thomson expansion of gases

(A) entropy remains constant
(B) enthalpy remains constant
(C) temperature remains constant
(D) pressure remains constant

59. For an $n^{th}$ order reaction, the unit of rate constant is

(A) $time^{-1}$ $mole^{-1}$
(B) $time^{-1}$ $concentration^{(n-1)}$
(C) $time^{-1}$ $concentration^{(1-n)}$
(D) $concentration^{(n-1)}$

60. Arrhenius equation shows the variation of _______ with temperature

(A) reaction rate
(B) rate constant
(C) activation energy
(D) reaction order

61. Differential method of analyzing kinetic data's is used

(A) for testing complicated mechanism
(B) when the data's are scattered
(C) when rate expression is simple
(D) when testing specific mechanism

62. For all positive reaction order and for a particular duty, the size of mixed flow reactor is always _______ the plug flow reactor

(A) smaller than
(B) equal to
(C) larger than
(D) data insufficient, can't predict

63. The concentration of reactant 'A' in a first order reaction, A→B, decreases_______ with time.

(A) linearly
(B) exponentially
(C) parabolically
(D) logarithmically

64. A plug flow reactor is characterized by

(A) variable residence time
(B) axial mixing
(C) lateral mixing
(D) non – flat velocity profile

65. Household domestic refrigerator work on principle of ____ refrigeration cycle

(A) Carnot
(B) air
(C) absorption
(D) vapour ejection

66. Mollier chart is a plot of

(A) temperature versus enthalpy
(B) temperature versus entropy
(C) enthalpy versus entropy
(D) temperature versus internal energy

67. Equilibrium constant of a reversible reaction depends mainly on

(A) initial reactant concentration
(B) temperature
(C) pressure
(D) amount of catalyst

68. The frequency at which the maximum amplitude ratio attained is called ____ frequency.

(A) corner
(B) crossover
(C) resonant
(D) natural

69. Thermistors are used in ______ devices

(A) voltage measuring
(B) only temperature measuring
(C) only temperature compensating
(D) both temperature measuring and compensating

70. At steady state condition in a process, the value of error signal is

(A) zero
(B) very large
(C) negative
(D) unity

71. The desired value of a variable in a process is also called as

(A) controlled variable
(B) set point
(C) disturbance
(D) offset

72. Freundlich equation applies to the adsorption of solute from

(A) dilute solutions over a small concentration range
(B) gaseous mixture at high pressure
(C) highly concentrated solutions
(D) multi component liquid mixtures

73. An operation carried out to recover valuable solute from the absorbing solution and regenerating the solution is called

(A) absorption
(B) leaching
(C) stripping
(D) diffusion

74. Heat transfer rate is low in the case of _______ boiling.

(A) film
(B) nucleate
(C) sub cooled
(D) transition

75. For most of the liquids the thermal boundary layer is thinner than the hydrodynamic boundary layer when Prandtl number is

(A) less than unity
(B) equal to unity
(C) greater than unity
(D) zero

76. The main product of high temperature carbonisation of coal is

(A) tar
(B) ammonia
(C) coke
(D) phenol

77. An example for continuous vacuum filter is _________ filter

(A) plate and frame
(B) rotary drum
(C) trickling
(D) centrifugal

78. Kopp's rule is concerned with the calculation of

(A) thermal conductivity
(B) heat capacity
(C) surface tension
(D) viscosity

79. Cavitation occurs in a centrifugal pump when the suction pressure is

(A) less than the vapour pressure of the liquid at that temperature
(B) greater than the vapour pressure of the liquid at that temperature
(C) equal to the vapour pressure of the liquid
(D) equal to the developed head

80. Terminal settling velocity is

(A) a fluctuating velocity
(B) attained after moving one half of total distance
(C) a uniform velocity with constant acceleration
(D) a constant velocity with no acceleration

81. The ratio of inertial forces to viscous forces is _______ number

(A) Mach
(B) Weber
(C) Fourier
(D) Reynolds

82. Discharge in laminar flow through a pipe varies

(A) as the square of the pipe length
(B) inversely as the pressure drop
(C) inversely as the fluid viscosity
(D) as the square of the pipe radius

83. Pressure drop in a packed bed for laminar flow is given by the _______ equation.

(A) Blake – Plummer
(B) Kozney – Karman
(C) Fanning's
(D) Hagen – Poiseuille

84. _____ type of closure is the weakest closure for cylindrical vessels

(A) Hemispherical
(B) Torispherical
(C) Flat plate
(D) Elliptical

85. The force due to wind load acting on a tall vessel depends upon its

(A) shape
(B) diameter
(C) height
(D) shape, diameter and height

86. Vertical vessels are not supported by

(A) brackets
(B) skirts
(C) columns
(D) saddles

87. Ultimate analysis of coal determines its

(A) Carbon, hydrogen, nitrogen and Sulfur
(B) moisture, volatile matter and ash
(C) calorific value
(D) combined molecular mass

88. Steel rods are used in reinforced concrete to increase its _____ strength

(A) shear
(B) tensile
(C) compressive
(D) rigidity modulus

89. Most suitable material for the storage of concentrated $HNO_3$ is

(A) cast iron
(B) white metal
(C) karbate
(D) aluminium alloys

90. The hardest known substance based on Mho scale reading is

(A) quartz
(B) gypsum
(C) diamond
(D) calcite

91. Presence of cobalt in steel improves its

(A) cutting ability
(B) corrosion resistance
(C) tensile strength
(D) ductility

92. Ceramic materials fabrication cannot be done by

(A) welding
(B) casting
(C) extrusion
(D) pressing

93. A 'rupture disc' is provided in chemical equipments as an accessory meant for

(A) relieving excess pressure
(B) creating turbulence
(C) enhancing mixing rate
(D) avoiding vortex formation

94. In the agitators, the power required will be changed with the increase of diameter of agitator (D) as

(A) $D^2$
(B) $D^5$
(C) $D^{½}$
(D) $D^{10}$

95. Percentage of hydrogen in coke oven gas may be around

(A) 10
(B) 25
(C) 45
(D) 60

96. _________ is also called as blue gas.

(A) Coke oven gas
(B) Water gas
(C) Natural gas
(D) Producer gas

97. Orsat analysis is meant for

(A) finding volumetric composition of flue gases
(B) finding combustion efficiency
(C) finding flame temperature
(D) calculating calorific value of fuel

98. If the value of Thiele modulus is >>1, then the rate controlling factor is

(A) surface reaction rate
(B) diffusion rate
(C) pore diameter
(D) pore length

99. Catalyst support (carrier) is used to improve

(A) surface area
(B) number of active centre
(C) selectivity
(D) reaction rate

100. In tanks – in – series model, the system behaviour approaches plug flow when the number of tanks connected in series becomes

(A) zero
(B) unity
(C) infinite
(D) fractional

101. ______ is not a process step in fluid – particle heterogeneous catalytic reaction

(A) Desorption
(B) Absorption
(C) Surface reaction
(D) Adsorption

102. BET apparatus is used to determine the _______ of a catalyst.

(A) pore volume
(B) bulk density
(C) specific surface area
(D) porosity

103. The dimensionless form of step response curve ($C_{step}$) is called

(A) E - curve
(B) C – curve
(C) binomial curve
(D) F curve

104. For shrinking spherical particles fluid – solid non catalytic reaction ____ layer is absent

(A) gas film
(B) ash
(C) boundary
(D) buffer zone

105. For a first order reaction, half – life period is _____ the initial reactant concentration

(A) independent of
(B) directly proportional to
(C) inversely proportional to
(D) varying exponentially with

106. Humidity of air can be determined by a

(A) chromatograph
(B) sling psychrometer
(C) mass spectrometer
(D) polarimeter

107. The Laplace transform of the function *y(t) = sin at* is

(A) $\dfrac{S}{S^2+a^2}$

(B) $\dfrac{a}{S^2+a^2}$

(C) $\dfrac{S}{S^2-a^2}$

(D) $\dfrac{a}{S^2-a^2}$

108. For distillation column, if the nature of feed is partial vapour, then the moles of liquid flow in the stripping section (q) has the numerical limit

(A) $0 < q < 1$
(B) $q = 0$
(C) $q > 1$
(D) $q = 1$

109. The condensing temperature of a single pure substance depends only on the

(A) pressure
(B) temperature
(C) surface area
(D) density

110. Most commonly used rubber vulcanising agent is

(A) bromine
(B) sulphuric acid
(C) thiokol
(D) sulphur

111. Molasses is the starting material for the production of

(A) alcohol
(B) edible oils
(C) fatty acids
(D) hard soaps

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112. Essential oils are usually obtained by

(A) solvent extraction
(B) extractive distillation
(C) steam distillation
(D) leaching

113. Top suspended basket centrifuges are used extensively in

(A) plastic manufacture
(B) petroleum refining
(C) sugar refining
(D) milk powder manufacture

114. The ratio of the diameters of the largest and smallest particles in a comminuted product is generally of the order of

(A) $10^2$
(B) $10^{10}$
(C) $10^6$
(D) $10^4$

115. For a spherical particle of diameter ($D_p$), the value of sphericity is

(A) 1.414
(B) 0.5
(C) 0
(D) 1

116. Blake crusher is the common type of _____ crusher

(A) Jaw
(B) gyratory
(C) smooth – roll
(D) toothed – roll

117. ______ scale is only used for liquids with specific gravity greater than water.

(A) degree Baumme
(B) API
(C) Twaddell
(D) Brix

118. 1 torr pressure is equivalent to

(A) 1 Pascal
(B) 1 mmHg
(C) 1 bar
(D) 1 psi

119. One gm mole of ideal gas occupies a volume of ______ at STP

(A) 22.4 liters
(B) 1 $m^3$
(C) 22.4 $m^3$
(D) 22400 liter

120. The number of moles present in 32 gms of oxygen is

(A) 1
(B) 8
(C) $6.023 \times 10^{23}$
(D) 2

121. The drag coefficient in hindered settling is ________ in free settling.

(A) greater than
(B) same as
(C) lesser than
(D) 0.01 times of drag coefficient

122. Dimension of kinematic viscosity is

(A) $MLT^{-1}$
(B) $L^2T^{-1}$
(C) $L^2T$
(D) $L^2T^{-2}$

123. Newton's law of viscosity relates

(A) pressure gradient and fluid velocity
(B) concentration gradient and rate of angular deformation
(C) shear stress and velocity gradient
(D) viscosity and fluid temperature

124. Friction factor for a hydraulically smooth pipe at Reynolds number, $N_{Re}$ = 2100 is $f_1$. If the pipe is further smoothened (roughness is reduced) the friction factor at the same value of $N_{Re}$, will

(A) increase
(B) decrease
(C) remain unchanged
(D) increase or decrease depending on the pipe material

125. Air contains _______ oxygen by mass

(A) 21%
(B) 79%
(C) 23%
(D) 77%

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

(A) decreases
(B) increases
(C) is same as for coarse solid grinding
(D) is 1.5 times that for coarse solid grinding

127. Wheat is ground into flour in a

(A) hammer crusher
(B) roller crusher
(C) impact mill
(D) fluid energy mill

128. Dittus – Boelter equation for heat transfer by forced convection in turbulent flow is

(A) $\frac{h_i D}{k} = 0.023 \left(\frac{DG}{\mu}\right)^{0.8} \left(\frac{C_P \mu}{k}\right)^{1/3} \left(\frac{\mu}{\mu_w}\right)^{0.14}$

(B) $\frac{h_i D}{k} = 0.023 \left(\frac{DG}{\mu}\right)^{0.8} \left(\frac{C_P \mu}{k}\right)^{1/3}$

(C) $\frac{h_i D}{k} = 0.0023 \left(\frac{DG}{\mu}\right)^{0.33} \left(\frac{C_P \mu}{k}\right)^{0.8}$

(D) $h_i = 0.0023 \left(\frac{G^{0.8}\, k^{2/3}\, C_P^{1/3}}{D^{0.2}\, \mu^{0.47}}\right)$

129. The unit of thermal conductivity is

(A) W/(m °K)
(B) W/(gmole °K)
(C) W/$m^2$ °K
(D) J/kg °K

130. Emissivities are low for

(A) oxidized metals
(B) paints
(C) non metals
(D) polished metals

131. Ficks law statement is

(A) (heat flux) $\alpha$ (temperature gradient)
(B) (molar flux) $\alpha$ (concentration gradient)
(C) (momentum flux) $\alpha$ (velocity gradient)
(D) (molar flux) $\alpha$ (pressure gradient)

132. Pressure of 0.0001 absolute psi can be measured by ______ gauge.

(A) ionization
(B) pirani
(C) thermocouple
(D) Mcleoid

133. In an adiabatic process the

(A) heat transfer is zero
(B) temperature change is zero
(C) work done is infinite
(D) enthalpy remains constant

134. Second law of thermodynamics is concerned with the

(A) amount of energy transferred
(B) irreversible processes only
(C) non cyclic processes only
(D) direction of energy transfer

135. One ton of refrigeration capacity is equivalent to the heat removal rate of

(A) 1 kcal/sec
(B) 200 BTU/hr
(C) 200 BTU/day
(D) 200 B TU/min

136. For transportation of materials which are lumpy, abrasive and hot we use

(A) belt conveyor
(B) apron conveyor
(C) either (A) or (B)
(D) None of the above

137. Octane number is a measure of anti-knock properties of

(A) diesel oil
(B) naphtha
(C) gasoline
(D) jet fuel

138. Titanium dioxide is a pigment of colour

(A) blue
(B) black
(C) yellow
(D) white

139. For precise control of fluid flow rate the best performance is obtained by

(A) gate valve
(B) check valve
(C) globe valve
(D) None of the above

140. Steam traps are used to

(A) remove condensate
(B) remove liquid from vapour
(C) regulate pressure
(D) None of the above

141. Preheating of food into an evaporator

(A) reduces economy
(B) increases the heat transfer are
(C) decreases the heat transfer are
(D) requires higher pressure for operation

142. To extract oil from oil seeds the following equipment is used

(A) centrifugal extractor
(B) Bollman extractor
(C) pulse column
(D) packed column

143. Sticky material is dried in a

(A) tray drier
(B) rotary drier
(C) fluid bed drier
(D) spouted bed drier

144. Unit of fugacity is

(A) atm./mole
(B) atm.
(C) atm/°K
(D) None of the above

145. For a spontaneous process, °G is

(A) negative
(B) zero
(C) positive
(D) None of the above

146. The most suitable reactor for autocatalytic reaction is

(A) plug flow
(B) CSTR
(C) recycle reactor
(D) CSTRs in series

147. For prevention of fluid leakage around moving ports, normal device used is

(A) stuffing box
(B) bellow
(C) packless joint
(D) expansion loop

148. Gas oil is converted to gasoline by the process of

(A) stabilization
(B) cracking
(C) coking
(D) isomerisation

149. Long-tube vertical evaporators have excellent performance for

(A) viscous liquor
(B) scaling liquor
(C) salting liquor
(D) foamy liquor

150. Cascade control means

(A) one feed back and one feed forward
(B) two feed forward
(C) two feed backs or more
(D) None of the above

# CHEMICAL ENGINEERING - ANSWER KEY

## TEST CODE: 603

| QN. NO. | KEY | QN. NO. | KEY | QN. NO. | KEY | QN. NO. | KEY | QN. NO. | KEY |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 26 | D | 51 | A | 76 | C | 101 | B |
| 2 | C | 27 | C | 52 | B | 77 | B | 102 | C |
| 3 | B | 28 | B | 53 | D | 78 | B | 103 | D |
| 4 | C | 29 | B | 54 | B | 79 | A | 104 | B |
| 5 | C | 30 | D | 55 | A | 80 | D | 105 | A |
| 6 | B | 31 | C | 56 | D | 81 | D | 106 | B |
| 7 | A | 32 | D | 57 | A | 82 | D | 107 | B |
| 8 | D | 33 | D | 58 | B | 83 | B | 108 | A |
| 9 | C | 34 | B | 59 | C | 84 | C | 109 | A |
| 10 | D | 35 | A | 60 | B | 85 | D | 110 | D |
| 11 | A | 36 | B | 61 | A | 86 | D | 111 | A |
| 12 | B | 37 | C | 62 | C | 87 | A | 112 | C |
| 13 | B | 38 | D | 63 | B | 88 | B | 113 | C |
| 14 | C | 39 | A | 64 | C | 89 | D | 114 | D |
| 15 | C | 40 | C | 65 | C | 90 | C | 115 | D |
| 16 | A | 41 | C | 66 | C | 91 | A | 116 | A |
| 17 | D | 42 | D | 67 | B | 92 | A | 117 | C |
| 18 | D | 43 | D | 68 | C | 93 | A | 118 | B |
| 19 | A | 44 | D | 69 | D | 94 | B | 119 | A |
| 20 | B | 45 | C | 70 | A | 95 | D | 120 | D |
| 21 | C | 46 | C | 71 | B | 96 | B | 121 | A |
| 22 | C | 47 | D | 72 | A | 97 | A | 122 | B |
| 23 | D | 48 | B | 73 | C | 98 | B | 123 | C |
| 24 | B | 49 | A | 74 | A | 99 | A | 124 | A |
| 25 | A | 50 | C | 75 | C | 100 | C | 125 | C |

| QN. NO. | KEY |
|---|---|
| 126 | B |
| 127 | B |
| 128 | B |
| 129 | A |
| 130 | D |
| 131 | B |
| 132 | D |
| 133 | A |
| 134 | D |
| 135 | D |
| 136 | B |
| 137 | C |
| 138 | D |
| 139 | C |
| 140 | A |
| 141 | C |
| 142 | B |
| 143 | A |
| 144 | B |
| 145 | A |
| 146 | C |
| 147 | A |
| 148 | B |
| 149 | D |
| 150 | C |